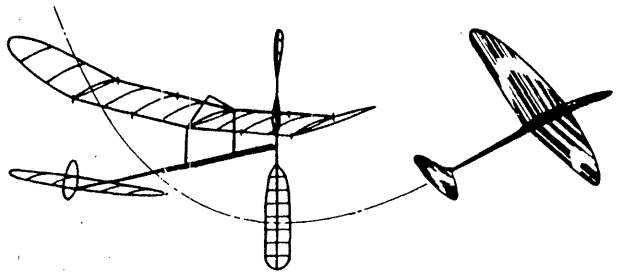
The Voice of N.I.M.A.S. MAR • 1990

INDOOR NEWS and VIEWS



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Editors: Richard & Melody Doig – 6 Canary Hill Drive, Pontiac, MI 48055 (313) 373-5374

1990 F1D WORLD CHAMPIONSHIPS

AMA INDOOR NATIONALS

NINTH UNITED STATES INDOOR CHAMPIONSHIPS

MINIDOME – JOHNSON CITY, TN – JUNE 4-9

THIS ISSUE

Melody and I got really burned out last year with the effort to move the 1989 Indoor NATS and F1D Team Finals to the Kibbie Dome, and we just needed a break. We decided to ignore modeling for a while, do lots of snow skiing this winter, and generally clean up our lives.

As part of that effort, we sat down in late October and made a list of all the activities we were involved in during 1988 and 1989, in an effort to plan 1990. We were startled by the number of activities we had said "yes" to over the past few years. In an effort to get things back under control, we decided to concentrate our efforts on the few items where we felt we could accomplish the most good, and divorce ourselves from the other activities.

So, we have decided to concentrate on INAV, and to retain my positions on the Indoor Contest Board and F1D Team Selection Committee. We will not run any local contests (we ran 3 in 1989), and we will limit our work at national meets to on-site work only, since the jobs that require significant advance preparation are the real time consumers.

It is our opinion that getting out a newsletter on a regular basis is critical to continued growth in indoor, and this is where we are going to try to put our efforts.

Several people have suggested that we either turn over INAV to another person, or possibly combine INAV into the NFFS Free Flight Digest, if we are unable to get INAV back on a regular schedule. Combining into the Digest has it's appeal, since the assembly and mailing of 425 copies is a bit time consuming, but it also has it's drawbacks. In a letter to Tony Italiano back in November, we proposed that we attempt to get out at least three issues before Johnson City, and if we couldn't, we would turn the activity over at that meet.

This was supposed to be a January issue, but the flu epidemic in January got both of us, and combined with four weekend trips during February and early March, has delayed this issue. Can we get things going again? I don't know. We will see.

1990 INDOOR WORLD CHAMPIONSHIPS

The 1990 Indoor World Championships will be held in the ETSU Minidome in Johnson City, Tennessee, on June 3-6, 1990. At the December meeting of the CIAM, Romania's tentative bid to host the champs was denied because their FAI dues were not up to date. This left the FF subcommittee with no bids for the 1990 World Champs. Rumors of England bidding for the meet turned out to be false. Some fast planning and several phone calls by the National Free Flight Society resulted in AMA submitting a bid for the US to host the meet, with NFFS actually running the contest. In late January, I received word that the bid was approved.

Even though the Kibbie Dome in Moscow, Idaho had been promoted as a possible site, NFFS felt that Johnson City would allow more of the contest officials and supporters to attend for less money than Moscow. Also, ETSU rental fees are about 2/3 of the Moscow rent. One of the conditions for allowing NFFS to put this bid together was that it must be a self-supporting meet, and be run without losing money as has happened in previous World Champs.

The World Champs will be held back to back with the 1990 USIC/AMA Nationals. All those attending the World Champs are invited to stay for the remainder of the week.

I personally feel that having two World Champs back to back in North America might be counter productive due to the expense involved for the foreign teams, but I also feel that having no World Champs in 1990 would be far more devastating.

CALL FOR WORKERS FOR 1990 WORLD CHAMPS

Workers, especially timers, are needed for the World Champs. Timers must be able to work all 3 days, starting with the orientation meeting the morning of June 4 thru the last round on June 6. If you are interested in working at the 1990 Indoor World Champs, please contact:

Tony Italiano
1655 Revere Drive
Brookfield, WI 53005
(414) 782-6256 after 7 pm Central time

THE JOHNSON CITY VENTS

Several modelers have had problems with the vents in Johnson City, and there have been several possible theories presented as to how they operate, opening and closing at what seemed like random intervals. After last year's problems with helicopters sticking in them and the rain pouring in through the vents, we decided to pursue exactly how they work.

Tony Italiano talked to the building people, and they insist that there are no controls on the vents anymore, that the control system was disconnected several years ago, and the vents sealed. He politely pointed out that the seal must have deteriorated, since the rain poured through last year.

The University people are of the opinion that the wind has been opening and closing the vents. They have agreed to re-seal the vents and double check that the controls are disconnected, sometime in the Spring before the 1990 World Champs. (I've suggested that they take a pair of wire cutters up on the roof with them, just to be certain that the controls are disconnected.) Hopefully this will solve the problem.

SEPARATE FREE FLIGHT NATS IN 1990

In 1988, outdoor Free Flight at the AMA Nationals was cancelled due to the loss of the intended field at the last minute. In an effort to fill the void, NFFS put together a replacement meet in late October at a site near Lawrenceville, Illinois. This meet drew about 90 contestants on 5 weeks notice.

NFFS ran a similar meet in June of 1989 at Lawrenceville, combining it with the SAM (Society of Antique Modellers) Champs, and drew something like 350 contestants. I've never been to a meet with 350 contestants before.

With this tremendous success as a background, AMA has decided to have NFFS run this year's Indoor and Outdoor Free Flight Nationals for them, and these events will not be held with the R/C and Control Line NATS. As such, the USIC in June at Johnson City will be the AMA Indoor Nationals for 1990. (See details and entry blank elsewhere in this issue.)

The 1990 AMA Outdoor Nationals will be combined with the United States Outdoor Championships on October 16 - 20 at Mid-American Air Center, Lawrenceville, IL. SAM 57 and FAC events and the Nostalgia Champs will also be part of the USOC. For details send #10 SASE to :

USOC, 4760 N. Battin, Wichita, KS 67220

USIC FUND ACQUISITION PLAN (FAP)

We all have acquired model supplies which are not useful to our present or projected building plans. Please find them and bring to the USIC. Please do not bring useless items. It is expected that we will conduct 2 on site raffles at 5 tickets/$1 donation. If sufficient material is donated we could go to the third day. The donated material may be supplies/kits for indoor, outdoor, u-control, R/C or new General Motor autos, etc..

GRAND PRIX (MIAMA Sponsored)

1) Pistachio - Maximum of 8" span or max or 6" overall length. No limit on type of construction, double covering not required, hand launching and 2 best flights (no limit) determines. Do require a 3 view and photo of full size aircraft.

1A) Model of a Model - Pistachio size model of an outdoor free flight fuselage model.

ALL ABOVE MODELS MUST FLY MINIMUM 30 SECONDS

SUB-EVENT - "RIDOTTO" smallest span model to fly over 30 seconds.

2) Coconut Scale - 36" minimum span for monoplanes/30" min. for multiwing, 1 oz. min. weight for model w/o rubber, ROG, best flight of 3 official determines (30 second min.). Static points based on Mooney rules at 10 feet. Any ties broken based upon best static points. Scale documentation not required.

3) George Bush/Miama Comet "Grumman Avenger" one design event. For full size plan and all rules send large SASE along with $3.50 to John Martin, 2180 Tigertail Av, Miami, FL 33133.

SCORES SUPPLEMENT

Due to our inactivity of the last few months, we have several lists of scores from major meets that we've never printed. All of these are from contests where we did the scoring on our portable computer, so they don't need any re-typing. Also, most of them are old news.

There are several subscribers to INAV who are fascinated by complete lists, but with the rise in activity at the USIC and NATS over the past 4 or 5 years, the space required has become disproportionate to their value for the bulk of subscribers (we think), at least it has for several vocal subscribers.

There is some value in knowing the winning times at Johnson City, for example, for the foreign competitors coming over for the World Champs who wish to stay for the rest of the meet. About 1/5 of our subscribers are overseas. So, we are including these scores as a supplement at our own expense this time, and not charging it against your subscription. That's a fair amount of paper and postage for the 425 issues we mail. If you don't like seeing that you placed 56th in EASY B, and hoped no one else would notice, oh well.

SUBSCRIPTION INFO

Indoor News & Views is published approximately four times per year. Current rates are:

$8.00 USA, Canada, & Mexico
$9.00 Overseas Surface Mail
$11.00 Air Mail, Europe & South America
$12.00 Air Mail, Asia, Australia, New Zealand

Please make payment in U.S. Dollars by cash, money order, U.S. Postal money order, or check drawn on a U.S. bank. Make payable to the order of Richard Doig. Partial payments OK.

The number in the upper right-hand corner of the mailing label is the final issue of the current subscription.

FAI TAN RUBBER

Early in 1989, FAI Model Supply introduced their new tan rubber. Initial reports from the first batch sounded discouraging (3500-3600 ft-lbs/lb), but there apparently was a second batch, and I received 3 pounds from it in late May, intending to use this for outdoor flying.

However, when I tested it, I got energy storage numbers in the range of 3950 ft-lbs/lb, which is as good or better than almost all of the Pirelli I've ever seen. It had a stretch ranging from 8.1 to 8.25, which is stretchier than all of the high energy storage Pirelli I've ever tested (my Pirelli tests showed stretches of 7.3 to 7.4 on average).

For several reasons (most of them dumb), I continued to use Pirelli through the Team Finals, but both Larry Cailliau and Don Slusarczyk used the new tan rubber at the Finals, and both placed ahead of me.

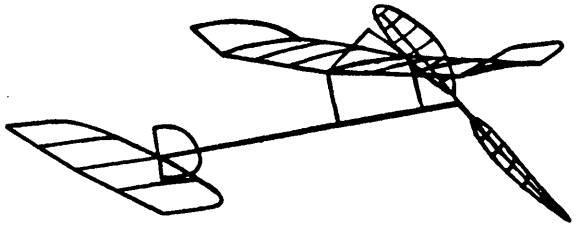
I began to fly the FAI tan rubber at an Autumn contest in Detroit, and the main thing I noticed is that it has a very supple feel, and doesn't feel as though it is about to explode during winding the way my Pirelli does. I did a flight of 17:30 under 40 ft, no touch. It seems as though this rubber may actually have more potential than even Pirelli, since it will take more turns, as indicated by the stretch numbers.

In actual practice, you need to use a slightly shorter and thicker loop of the tan to get the same performance as from the light brown Pirelli, as the same amount of energy storage spread over more turns will yield less power per revolution of the prop. The torque curve is very flat, much like the good Pirelli.

I haven't a clue as to what kind of lube to use on this new rubber, since my existing lubes don't stay put as well as they did on the Pirelli. However, the tan holds these lubes far better than the old gray FAI did.

I have just received a report that a recent batch had very low energy numbers, on the order of 3100 ft-lbs/lb. I hope this isn't representative of future production runs, because we need a reliable source of decent rubber if indoor flying is to continue to grow. Only time will tell.

FAI Model Supply	1/4", 3/16", 1/8", 3/32"
P.O. Box 3957	1/16", all .042" thick
Torrance, CA 90510	1 lb. box $13.75
213-830-8939	postpaid in US via UPS
	CA residents add 6% tax
	Catalog $1.50



FLYING SITE STATUS

Things have changed drastically in the flying site picture over the last 12 months. The good news is there is now indoor flying once again in Lakehurst. The bad news is that there is no flying in Santa Ana. Akron is questionable as more and more structures are erected inside the Airdock.

The allure of flying in the dirigible hangers is that for close to 40 years, they were the largest buildings around. Plus, there has usually been no charge to use the facilities. But the strict security requirements for access to these sites are in conflict with AMA sanctioning policies for contests, and thus limit the activities to FAI team selection and record trials. Also, the unpredictable weather in the East and Midwest, and the unpredictable military activities in California have made these sites less attractive than they used to be.

I have always felt that colleges & universities offered more potential for flying sites, since most are not in the business of renting the facilities outside of student activities. It is also feasible to obtain a regular site by methods other than paying direct rent. For example, Oakland University near my home has a Presidents Club, where people or groups who donate money to the school get the free use of the facilities for the year (unfortunately they don't have a suitable indoor site).

In addition to the USIC in Johnson City, Andy Tagliafico is putting together a meet for the Kibbie Dome in Moscow, to be held the first weekend of August. These domed football stadiums are wonderful places to fly, with decent lighting, good facilities, and a floor that is easy on the feet and knees (if the astro-turf is in place). And they are generally a lot wider at the roof than the Airdocks. Unfortunately, they do charge rent, in many cases proportional to the perceived ability of the group to pay. In other words, they charge what the market will bear.

Do not mis-understand me, I feel that we MUST continue to use the Airdocks as long as they are available, since there are so very few large building anywhere - but we must always be looking for alternatives for the day they are no longer available.

VINCE MANKOWSKI SUCCEEDS JOHN WORTH

John Worth has retired as AMA Executive Director. He will continue to work for AMA on several special projects, but he is no longer the head of day to day operations. Vince Mankowski has succeeded John as Executive Director, and has lots of fresh ideas.

Several people, myself included, have had run-ins with Vince over the years, but I've always felt that he did the best job he could with the NATS within the constraints of Executive Council directives. In other words, he did what his bosses told him to do.

I feel that Vince will do an excellent job as Executive Director, as he seems sensitive to the needs of indoor flyers. After all, Vince is not an R/C flyer, but a Control Line flyer, and these days, C/L is an endangered species, even when compared to Indoor.

1989 UNITED STATES INDOOR CHAMPS

There were several interesting stories at the 1989 USIC. The first big story was the new FAI tan rubber, discussed elsewhere in this issue. Another big story was the weather.

Unlike past USIC's which have been blessed by great weather, last year was really different. We had some rain every day, with temperatures in the 60's and low 70's, and during Easy B (I think) we had a tremendous thunderstorm complete with tornadoes in the area, large hail, and about three inches of rain in 20 minutes. The rain was literally blowing sideways, and at the height of the storm, water just poured in through the vents in the center of the building, removing any doubt that the vents were open to the outside air and not sealed.

Surprisingly, the air recovered rather quickly after the rain, but times in most events were lower than normal due to the much cooler air after the daily rain showers went through the area.

The other big stories were about models and rules. The first controversy was in helicopter, when a young Canadian flyer had his model stick in the vents. The lower rotor continued to rotate, but the upper rotor was in-between the louvers, and was stationary. Was the model hung up? The timing continued, the model freed itself at about 15 minutes, and dropped to the floor. (This exceeded the previous high time ever done with a helicopter by about 5 minutes.) As a result, the Contest Board members in attendance (8 of us, including the chairman) got together and drafted a ruling which says:

INTERPRETATION OF THE HELICOPTER RULES TO COVER FLIGHT IN LIMITED CEILING CONDITIONS: If an indoor helicopter ceases translational movement, and if any rotor(s) or vane(s) stop rotating, the flight shall be considered to have stopped. In that case, the watches shall be permitted to run for an additional ten seconds. If translational movement resumes or if the stopped rotor(s) or vane(s) resume rotation within ten seconds, timing shall continue. Otherwise, the watches shall be stopped and ten seconds shall be deducted from the time indicated and the resulting time recorded.

The second controversy was in Easy B, where the Event Director Don Lindley ruled Dick Obarski's torque burner illegal, on the basis that it was a brace not entirely made of wood. It was not clear to the rest of us at that time why Don had disallowed the model, and I found this out in a phone conversation with Don after the meet. However, the Indoor Contest Board ultimately issued the following interpretation:

INTERPRETATION TO DISALLOW THE TORQUE BURNER IN EASY B: It is prohibited to use any scheme, device, or mechanism, except for propeller blade flare or deformation, which affects the rate of energy release from the rubber motor.

The third controversy was in ROG Cabin, when Event Director Charlie Sotich ruled two of the disc type models illegal, (discs glued to the bottom of the rolled tube) on the basis of the motor not passing through the built-up structure(s). Meanwhile several people had been researching this topic, and found that a Contest Board ruling made in the late 30's had been deleted from the rules by a printing error in 1959, and was actually still in effect! We combined the original ruling with an explanatory note and drafted the following:

INTERPRETATION OF CABIN MODEL FUSELAGE REQUIREMENTS: A rolled tube used as part of an indoor cabin model fuselage shall not be considered to be a built-up structure. When a rolled tube is used as part of a cabin model fuselage, the balsa shall not be considered to be covering. When a covered superstructure is used to fulfill the requirements of Section 5, Cabin Model, the superstructure must entirely enclose the rubber motor(s) as defined in Section 5.

This means that disc models are illegal, as well as balsa tubes with a bubble. Only full body models, and rolled tubes with a superstructure that extends beyond the end of the rubber are currently legal.

The rest of the meet just seems blurry, as there were something like 95 contestants, and lots of activity. All in all, it was an outstanding meet.

AMA PROPERTY PURCHASE

AMA has signed an agreement to purchase approximately 1280 acres of land southeast of Muncie, Indiana as a National flying site. THIS IS NOT THE SITE THAT WAS TALKED ABOUT LAST FALL! It is much, much, better. Total change in elevation for this 1 1/2 square mile parcel is 8 feet, and current off-site chasing looks very good. There is also the potential to purchase adjacent parcels.

Current crop leases on the land run out in the next two to three years, and at that time AMA will dictate what kind of crops are to be grown by the farmers for ease of chasing. Why continue to farm? Simple. If you don't mow a field yearly, in 20 years it becomes a woodland. By leasing the land to farmers, the farmers mow it twice a year, and pay you for the privilege.

What about indoor? Well, it seems that the Muncie city managers are extremely concerned, because they are building a new exhibition and civic center (the drawings have just been started), and they are afraid that AMA will build their own exhibition center and go into competition with them for convention and event business. According to Vince Mankowski, the Muncie people are willing to adapt their exhibition hall design to make it suitable for indoor flying, in return for AMA not going into competition with them.

This would mean either Category II, or III with a smooth ceiling. It looks as though the indoor community will actually get a chance later this year to have some input into an indoor site while its still on paper. Amazing!

1989 AMA NATIONALS & FAI TEAM SELECTION FINALS

This was a unique meet since the FAI Indoor Team Selection Finals were incorporated into the Nationals, with the Indoor Team Selection fund paying part of the rent for the three day meet. Sixty seven contestants gathered in Moscow, Idaho to prove how important the site is to drawing contestants, as Moscow is not an easy place to get to. Outstanding flying was the order of the day as record high temperatures raised the floor level temperature to the high 70's.

The meet started off with a bang as Stan Buddenbohm became one of only a small group of people to ever break 75 seconds with an indoor glider on his way to easily winning Open HLG. Stan also won Catapult with times in the high 80's. Scale and Peanut Scale were run simultaneously in the other half of the building, CD'd by the scale group that ran Control Line and R/C Scale. Entries in the Scale events were pitifully small due to the fact that Scale judging was two days earlier in Pasco, Washington (site of the outdoor events) 147 miles west of Moscow. Many indoor flyers who normally fly AMA Scale and Peanut Scale just didn't think it was worth it to make the drive.

At two o'clock the F1D models came out to start the Team Finals portion of the meet, along with ROG Cabin. ROG Cabin was largely ignored although Don Slusarczyk put up an outstanding 25 minute flight to easily win Senior. In F1D, Cezar Banks put up two 40 minute flights in the first two rounds, to insure a team spot for a fourth consecutive time. The remaining team members were not decided until the third day, when Larry Cailliau and Bob Randolph secured the other two places.

On day two, Pennyplane, Novice Pennyplane, and Manhattan were flown together, and it was the usual crowded conditions. As in glider, times were very high, and it was surprising how quickly most people adapted to a ceiling much higher than most had ever flown in before. In the afternoon, F1D continued, with Cailliau moving into the team picture using a variable pitch prop based on rubber tension, in principle like a tensioner stop on a Wakefield, rather than torque actuated mechanisms like most others. AMA Stick was also largely ignored, with Joe Foster winning Open, flying his F1D models in AMA Stick.

Day three started with Intermediate Stick, Ornithopter, Easy B, and a demonstration of a torque burner motor stick during the contestant meeting. I had built a 14" long, very light Easy B motor stick and equipped it with a torque burner.

I demonstrated that with a fully wound motor, if I did not hook up the torque burner, the stick bent out about 2" to the side, and if I didn't hold it, the stick would snap. I then hooked up the torque burner, and the stick only deformed about 1/16" to the side. I let the prop spin, and as the motor unwound, the torque burner released, and the stick stayed pretty straight.

My conclusion is that with a torque burner, you can successfully support more power than you can support without it, because the column lengths are shorter. In fact it is a brace, not entirely made from wood, and I declared it illegal on that basis. Whether or not a given stick will support the rubber without the burner is irrelevant, since there is no way for a CD to know during processing whether a contestant is exploiting the bracing aspect or not.

As with the other events, the times were very high, solidifying our opinion that the Kibbie Dome is a world class site.

We did all of the scoring on our portable computer, and the site manager loaned us their copier, and moved it out to our officials table. We were able to offer copies of the complete results approximately one hour after the end of each event. It was fabulous.

The logistics of running a meet and flying airline to get there posed some unusual problems for us. The contest and processing equipment filled eight boxes (124 pounds) that we shipped out to Andy Tagliafico, and picked up in Portland before heading up to Moscow. We also had to pick up the awards (22 boxes!) in Pasco, and drive them to Moscow. Along with my own models for the Team Finals, we filled a rented Mini-Van.

Andy made all of the site arrangements with some help from Bob Stalick. Andy and Bob also CD'd the F1D event for us. They really made this meet possible and we owe them our thanks for a job well done.

INDOOR AND OUTDOOR FREE FLIGHT SURVEY

AMA, in an October 1989 survey found 450 Indoor and 1503 Outdoor Free Flighters. These numbers are low. NFFS is doing this survey in an effort to get a good handle on Free Flight activity in the US. This is urgently needed to aid in the direction of future activities. (Non-US members can complete the survey, however the data will be kept separate.)

Please mail your completed survey form(s) no later than ~~March 17, 1990~~. ASAP
Send to: Anthony J. Italiano
1655 Revere Drive
Brookfield, WI 53005 USA

ATTENTION WORLD CHAMPS WORKERS/SPECTATORS

ETSU CAFETERIA: Meals will be served in the cafeteria on a cash basis. The days and hours are unknown as of this time. However, if you want a box lunch in the Dome, please indicate and include funds:

June 4 _____ June 5 _____ June 6 _____ at $3.25 per box lunch.

These will be the only meals served in the Minidome.

IF YOU WANT BOX LUNCHES DURING THE WORLD CHAMPS CUT ALONG DOTTED LINE AND SEND THIS FORM IN WITH YOUR DORM ROOM RESERVATIONS ON YOUR USIC ENTRY BLANK.

CONTEST CALENDAR

CALIFORNIA - BURBANK

Blacksheep Squadron flying on July 12: Embryo & HLG BBK, Sept 12: Indoor Scale Contact: Tony Naccarato, 3512 W. Victory Blvd, Burbank, CA 91505 or (818) 842-5062.

CALIFORNIA - SAN DIEGO

San Diego Orbiteers indoor flying sessions and monthly meetings: 2nd Friday meeting, 4th Friday flying sessions 7:30 pm Colina Del Sol Community Center, 5319 Orange Av. March: HLG, April & May: Pussy Cat, June & July: Chili Bean. Contact: John Hutchison (619) 669-0146.

CALIFORNIA - SAN FRANCISCO

Possible flying in the Cow Palace. CAT III. Contact: Bud Romak 85 Sullivan Dr., Moraga, CA 94556 or (415) 376-4624.

CALIFORNIA - TUSTIN

There is NO flying in Hangar #1 for the near future. To check on flying status and get on the security list contact Curt Stevens, 25108 Marguerite Pkwy. #B-160, Mission Viejo, CA 92691 or (714) 240-8404.

CONNECTICUT - GLASTONBURY

Glastonbury Modelers Spring Fling on April 1 at Glastonbury High School. EZB, P'nut, AMA Scale (FAC rules), HLG, Dime Scale, FAC Scale, P'nut(FAC rules), 14g Bostonian, No-cal Scale, WWI & WWII Mass Launch. Contact CD: George Armstead Jr. 89 Harvest Ln, Glastonbury, CT 06033 or (203) 633-7836.

CONNECTICUT - WILTON

New England Indoor Group flys at Wilton High School. Contact Roger Kleinert (203) 655-1585

FLORIDA - MIAMI

MIAMA Proxy Pistachio Intergnats on April 21 & 22 at Miami Dade South College 11011 SW 104th St. Call to Confirm: Dr. John Martin, 2180 Tigertail Av, Miami, FL 33133 (305) 858-6363.

FLORIDA - TAMPA

M.I.A.M.A. Indoor meet #5 end of March and last meet on May 19 & 20 in Hanger 5 at MacDill AFB. Contact: Dr. John Martin, 2180 Tigertail Av. Miami, FL 33133 (305) 858-6363.

IDAHO - MOSCOW

Indoor flying possible the first weekend of August in Kibbie Dome at University of Idaho. Contact: Andy Tagliafico 650-B Taybin Road NW, Salem, OR 97304 or (503) 371-0492.

KANSAS - TOPEKA

Kansas Indoor State Model Aircraft Champs 2nd annual for CAT II on April 21 at Washburn University - Whiting Fieldhouse. Manhattan, 7g Bostonian, EZB, Limited PP, HLG, P'nut, Peck ROG, 7g No-cal, Federation ROG, 14g Bostonian, Pistachio,, Old Timer Baby ROG.

KANSAS - TOPEKA continued

First TOPMAC Indoor meet (combined funfly, club record trials & mini-contest)on May 13 at the Old Stone Hangar, Philip Billard Municipal Airport. Check hangar availability the day before with the CD. Contact for both meets: Jack Koehlar 3425 Arrowhead Rd, Topeka, KS 66614 or (913) 272-8439.

MICHIGAN - STERLING HEIGHTS (north of Detroit)

Cloudbuster Winter Indoor program at Heritage Jr. HS. Dodge Park at 16 Mile Road. 7:30 - 9:30 pm March 23, April 6, April 20. Contact: George Lewis 3997 South River Road, #6, St. Clair, MI 48079 (313) 329-6833.

MINNESOTA - BURNSVILLE

Monson's Indoor Massacre on April 8 at Burnsville Senior High School (CAT II). EZB, PP, HLG, P'nut, Walnut Scale (modified FAC rules), Bostonian (West Coast rules), No-cal, Indoor Towline & Junior Rubber. Contact: D. Monson 131 W. Wentworth W., St Paul, ZMN 55118 or (612) 457-2321.

NEW YORK - NEW YORK CITY

Columbia Indoor Model Aircraft Society flying sessions and contests in the Low Library Rotunda (CAT III) at Columbia University. May 20. Contact Praful Zope (212) 853-7602 or Ed Whitten (212) 724-0282.

OHIO - AKRON

Possible F1D Team Selection contests & Record Trials. Loral Airdock at Akron Municipal Airport. Call Bill Hulbert to find out if any 1990 sessions will be scheduled. Bill Hulbert, 174 Castle Blvd, Akron, OH, 44313 or 216-864-8030.

OHIO - PARMA

Cleveland Free Flight Society contest April 1 at Normandy High School gym, 2500 W. Pleasant Valley Road. CAT III - 53' dome. 8 am to 5 pm. EZB, Jetco ROG, F1D, Hi-wing P'nut, No-cal, WWI Biplane mass launch, WWII No-cal, 7g Bostonian & Int. Stick. Contact: Michael Zand 7055 Seven Hills Blvd., Seven Hills, OH 44131 (216) 524-3480.

PENNSYLVANIA - BYRN ATHEN

Delaware Federation Indoor flying on Tuesday evenings at Academy of the New Church fieldhouse. CAT I (25'9") Contact: Joe Krush 409 Warner Rd, Wayne PA 19087 (215) 688-3927.

PENNSYLVANIA - PHILADELPHIA

Delaware Federation Indoor flying in Memorial Hall, Fairmont Park. Contact: Joe Krush (215) 688-3927.

TENNESSEE - JOHNSON CITY

1990 F1D World Championships on June 4-6 and Ninth United States Indoor Championships on June 7-9 in Minidome at East Tennessee State University. Info & entry blank in this issue.

1989 UNITED STATES INDOOR CHAMPIONSHIPS

HAND LAUNCH GLIDER JUNIOR	Best Flight	2nd Flight	TOTAL (BEST 2)	PLACE
Peter Kearney	29.0	26.2	55.2	1
Jeff Plassman	0.0	0.0	0.0	2
John Gagliano	0.0	0.0	0.0	3
Domenic Gagliano	0.0	0.0	0.0	4

HAND LAUNCH GLIDER SENIOR	Best Flight	2nd Flight	TOTAL (BEST 2)	PLACE
Jim Buxton	58.4	54.8	113.2	1
Don Slusarczyk	41.0	27.4	68.4	2
Joel Plassman	0.0	0.0	0.0	3

HAND LAUNCH GLIDER OPEN	Best Flight	2nd Flight	TOTAL (BEST 2)	PLACE
Bernie Boehm	68.4	66.4	134.8	1
Charles Gagliano	64.4	63.6	128.0	2
Bill Schlarb	53.2	52.8	106.0	3
Chuck Slusarczyk	52.0	50.2	102.2	4
Jesse Shepherd, Jr	49.8	45.6	95.4	5
Wayne Trivin	47.8	47.4	95.2	6
Vito Gagliano	48.0	45.4	93.4	7
Phil Hartman	46.8	45.0	91.8	8
Brian Pardue	43.8	36.6	80.4	9
Dan Belieff	37.6	37.0	74.6	10
Bob Warmann	0.0	0.0	0.0	11
Kris Warmann	0.0	0.0	0.0	12
Gerry Plassman	0.0	0.0	0.0	13

CATAPULT GLIDER JUNIOR	Best Flight	2nd Flight	TOTAL (BEST 2)	PLACE
Peter Kearney	37.4	35.6	73.0	1
Anthony DeSouza	32.2	31.6	63.8	2
Jeff Plassman	0.0	0.0	0.0	3
Dominic Gagliano	0.0	0.0	0.0	4

CATAPULT GLIDER SENIOR	Best Flight	2nd Flight	TOTAL (BEST 2)	PLACE
Jim Buxton	56.0	55.0	111.0	1
Joel Plassman	0.0	0.0	0.0	2

CATAPULT GLIDER OPEN	Best Flight	2nd Flight	TOTAL (BEST 2)	PLACE
Chuck Markos	77.8	75.4	153.2	1
Bob Warmann	72.6	67.8	140.4	2
Bill Schlarb	71.0	69.2	140.2	3
Ralph Schlarb	69.8	69.8	139.6	4
Jesse Shepherd, Jr	71.0	65.2	136.2	5
Keith Fulmer	65.0	62.0	127.0	6
Ed Konefes	62.2	62.2	124.4	7
Wayne Trivin	62.8	61.2	124.0	8
Gordy Wisniewski	62.6	60.8	123.4	9
Jim Thornbery	60.2	58.0	118.2	10
Dick Obasrski	57.4	57.0	114.4	11
Jim Davidson	57.2	56.4	113.6	12
Vito Garafalo	56.0	53.4	109.4	13
Mike Arak	49.8	47.4	97.2	14
Bill Henderson	48.6	48.2	96.8	15
Phil Hartman	51.0	43.8	94.8	16
Richard Ennis	47.4	45.2	92.6	17
Jack Greene	46.0	46.0	92.0	18
Wally Simmers	44.6	44.6	89.2	19
John Voorhees	44.2	43.4	87.6	20
Richard MacEntee	41.4	41.0	82.4	21
Fred Rash	40.2	38.4	78.6	22
Jesse Shepherd, Sr	42.8	23.6	66.4	23
Ed Burke	27.4	25.6	53.0	24
Otto Curth	29.0	0.0	29.0	25
Burr Stanton	0.0	0.0	0.0	26
Chuck Slusarczyk	0.0	0.0	0.0	27
Gerry Plassman	0.0	0.0	0.0	28
Doc Martin	0.0	0.0	0.0	29
Garry Hunter	0.0	0.0	0.0	30
Lew Gitlow	0.0	0.0	0.0	31
Cliff Culpepper	0.0	0.0	0.0	32
Bernie Boehm	0.0	0.0	0.0	33
Bill Bigge	0.0	0.0	0.0	34

PENNYPLANE JUNIOR/SENIOR	Best Flight	Place
Don Slusarczyk (Sr)	14:00	1
Jim Buxton (Sr)	09:31	2

PENNYPLANE OPEN		Best Flight	Place
Chuck	Slusarczyk	15:05	1
Larry	Loucka	14:51	2
Gordy	Wisniewski	14:47	3
John	Marett	14:29	4
Joe	Nuszer	14:19	5
Les	Garber	13:57	6
Ken	Groves	13:49	7
Walt	Van Gorder	13:21	8
Doug	Barber	12:39	9
Terry	Hreno	12:36	10
Ron	Ganser	12:29	11
Phil	Hartman	12:16	12
Pete	Staehling	12:03	13
John	Voorhees	11:58	14
Jim	Clem	11:56	15
Dan	Belieff	11:28	16
Manny	Radoff	10:34	17
Charles	Gagliano	10:24	18
Bob	Oppegard	09:59	19
Joe	Krush	09:46	20
Jim	Grant	09:24	21
Ed	Konefes	09:11	22
Tony	Italiano	08:58	23
Tom	Vallee	08:49	24
Tony	Sutter	08:26	25
Bob	Champine	07:33	26
Dick	MacEntee	03:58	27
Bob	Warmann	00:00	28
Kris	Warmann	00:00	29
Wally	Simmers	00:00	30
Jess	Shepherd	00:00	31
Fred	Rash	00:00	32
Russ	Putnam	00:00	33
Jim	Jones	00:00	34
Jim	Davidson	00:00	35
Chet	Wrzos	00:00	36
Vito	Gagliano	00:00	37

INTERMEDIATE STICK JUNIOR/SENIOR	Best Flight	Place
Don Slusarczyk (Sr)	23:48	1
Peter Kearney (Jr)	17:37	2

INTERMEDIATE STICK OPEN		Best Flight	Place
Dan	Belieff	26:30	1
Ron	Ganser	24:13	2
Larry	Loucka	24:07	3
Dick	Obarski	23:48	4
Lew	Gitlow	22:41	5
Joe	Krush	22:08	6
Jim	Grant	21:56	7
Tony	Sutter	21:54	8
Ken	Groves	21:16	9
Walt	Van Gorder	21:02	10
Joe	Nuszer	19:48	11
Gordy	Wisniewski	19:37	12
Wally	Simmers	17:37	13
Dave	Aronstein	16:37	14
Doug	Barber	16:04	15
Bill	Henderson	15:44	16
Ed	Burke	15:12	17
John	Marett	14:44	18
Tom	Vallee	13:03	19
John	Voorhees	11:31	20
Don	Krupp	10:29	21
Gary	Underwood	00:00	22
Chester	Wrzos	00:00	23
Pete	Staehling	00:00	24
Chuck	Slusarczyk	00:00	25
Les	Garber	00:00	26
Bill	Bigge	00:00	27
Russ	Putman	00:00	28
Billie	Landrum	00:00	29

NOVICE PENNYPLANE JUNIOR		Best Flight	Place
Peter	Kearney	09:46	1
Tony	Desouza	06:11	2
Domenic	Gagliano	00:00	3
Jeff	Plassman	00:00	4
John	Gagliano	00:00	5

NOVICE PENNYPLANE SENIOR		Best Flight	Place
Don	Slusarczyk	09:48	1
Jim	Buxton	08:21	2
Joel	Plassman	00:00	3

NOVICE PENNYPLANE OPEN		Best Flight	Place
Bob	Champine	12:27	1
Richard	Miller	12:16	2
Chuck	Markos	11:57	3
Walt	Van Gorder	11:57	4
Phil	Hartman	11:51	5
Tom	Vallee	11:50	6
John	Voorhees	11:28	7
John	Barker	11:27	8
Ken	Groves	11:27	9
John	Marett	11:23	10
Joe	Nuszer	11:18	11
Les	Garber	11:12	12
Doug	Barber	11:10	13
Wayne	Trivin	11:06	14
Chuck	Slusarczyk	11:02	15
Del	Ogren	10:54	16
Jim	Grant	10:53	17
Jim	Clem	10:47	18
Bill	Henderson	10:41	19
Bill	Clarke	10:41	20
Garry	Hunter	10:25	21
Ron	Ganser	10:18	22
Jim	Davidson	10:03	23
Chet	Wrzos	09:52	24
Wally	Simmers	09:44	25
Pete	Staehling	09:41	26
Vito	Gagliano	09:29	27
Plenny	Bates	09:21	28
Ken	Crump	09:19	29
Gordy	Wisniewski	09:19	30
Ed	Konefes	09:17	31
J	Blair	09:08	32
Charles	Gagliano	09:05	33
Jim	Thornberry	08:54	34
Tony	Sutter	08:52	35
Bud	Tenny	08:35	36
Ed	Burke	08:21	37
Dick	MacEntee	08:11	38
Otto	Curth	08:01	39
Stu	Weckerly	08:00	40
Bob	Oppegard	07:15	41
Bob	Butsch	07:09	42
Jim	Jones	07:04	43
David	Smith	06:51	44
Dick	Obarski	06:43	45
Lou	Leifer	05:14	46
Manny	Radoff	02:44	47
Larry	Loucka	00:00	48
Kris	Warmann	00:00	49
John	Triolo	00:00	50
Burr	Stanton	00:00	51
Fred	Rash	00:00	52
Russ	Putnam	00:00	53
Gerry	Plassman	00:00	54
George	Leffler	00:00	55
Billie	Landrum	00:00	56
Howard	Henderson	00:00	57
Ed	Knight	00:00	58
Tony	Italiano	00:00	59
Tom	Green	00:00	60
Gil	Graunke	00:00	61
Lew	Gitlow	00:00	62
Dick	Ennis	00:00	63
Cliff	Culpepper	00:00	64
Bill	Bigge	00:00	65
Dave	Aronstein	00:00	66
Carl	Butsch	00:00	67
Bob	Warmann	00:00	68
John	Fellin	00:00	69

1989 UNITED STATES INDOOR CHAMPIONSHIPS

EASY B JUNIOR/SENIOR		Best Flight	Place
Don	Slusarczyk (Sr)	17:09	1
Peter	Kearney (Jr)	16:33	2
Jim	Buxton (Sr)	13:08	3
Joel	Plassman (Sr)	00:00	4

EASY B OPEN		Best Flight	Place
Chuck	Markos	22:01	1
John	Marett	20:38	2
Walt	Van Gorder	20:35	3
Andy	Tagliafico	20:23	4
Les	Garber	19:56	5
Richard	Miller	19:50	6
Gordy	Wisniewski	19:36	7
Ken	Groves	18:40	8
Jim	Grant	18:39	9
Wally	Simmers	16:22	10
Lew	Gitlow	16:18	11
Joe	Krush	15:58	12
Doug	Barber	15:52	13
Ron	Ganser	15:49	14
Dick	Obarski	15:47	15
Dan	Belieff	15:39	16
Bill	Henderson	15:39	17
Joe	Nuszer	15:10	18
John	Barker	14:57	19
Charles	Gagliano	14:56	20
Bob	Champine	14:38	21
Gary	Underwood	14:26	22
Howard	Henderson	14:13	23
Stu	Weckerly	14:11	24
Jim	Clem	14:02	25
Pete	Staehling	12:42	26
Wanyne	Trivin	11:32	27
Dick	MacEntee	11:17	28
Jess	Shepherd, Sr	10:53	29
Tom	Vallee	10:30	30
Otto	Curth	10:02	31
John	Fellin	09:45	32
Garry	Hunter	09:41	33
Vito	Gagliano	09:21	34
Terry	Hreno	09:15	35
Ed	Konefes	09:08	36
Tony	Sutter	08:51	37
Fred	Rash	07:33	38
Manny	Radoff	07:32	39
Bob	Loeffler	07:31	40
Chuck	Slusarczyk	07:16	41
Bob	Oppegard	07:08	42
Chester	Wrzos	05:57	43
Ed	Knight	05:47	44
Jess	Shepherd, Jr	05:36	45
Carl	Butsch	04:12	46
Len	Singer	03:58	47
Don	Krupp	03:48	48
Bob	Warmann	00:00	49
Burr	Stanton	00:00	50
Gerry	Plassman	00:00	51
Larry	Loucka	00:00	52
George	Leffler	00:00	53
Phil	Hartman	00:00	54
Walt	Everson	00:00	55
Richard	Ennis	00:00	56
Lou	Leifer	00:00	57
Russ	Putnam	00:00	58
Gil	Graunke	00:00	59
Jim	Davidson	00:00	60

GRAND CHAMPION		TOTAL (7 EVENTS)	Place
Ken	Groves	622.9	1
Ron	Ganser	570.3	2
Larry	Loucka	506.6	3
John	Marett	479.2	4
Walt	Van Gorder	450.4	5
Joe	Krush	433.1	6
Don	Slusarczyk (Sr)	415.2	7
Jim	Grant	396.9	8
Chuck	Slusarczyk	365.4	9
Dick	MacEntee	328.5	10
Tom	Vallee	232.0	11
Jess	Shepherd, Jr	196.3	12
Jim	Davidson	145.2	13
Fred	Rash	34.3	14
Russ	Putnam	0.0	15

MANHATTAN CABIN COMBINED AGES		Best Flight	Place
Joe	Krush	11:16	1
Larry	Loucka	10:39	2
Chuck	Markos	10:38	3
Walt	Van Gorder	10:29	4
Don	Slusarczyk (Sr)	10:28	5
Ken	Groves	10:19	6
John	Marett	09:58	7
Ron	Ganser	09:35	8
John	Triolo	09:04	9
Keith	Fulmer	09:02	10
Jim	Grant	08:59	11
Plenny	Bates	08:57	12
Charles	Gagliano	08:17	13
Chuck	Slusarczyk	07:40	14
Peter	Kearney (Jr)	07:36	15
Tony	Sutter	04:14	16
Jess	Shepherd, Jr	03:57	17
Millard	Wells	00:00	18
Burr	Stanton	00:00	19
Russ	Putnam	00:00	20
Gerry	Plassman	00:00	21
Rich	MacEntee	00:00	22
Bill	Henderson	00:00	23
John	Fellin	00:00	24
Jim	Davidson	00:00	25

NO-CAL COMBINED AGES		Best Flight	Place
Chuck	Slusarczyk	05:03	1
John	Marett	04:38	2
Bill	Henderson	03:40	3
Terry	Hreno	03:21	4
Stu	Weckerly	03:10	5
Dave	Aronstein	03:09	6
Jim	Miller	02:53	7
Ken	Groves	02:52	8
Bob	Butsch	02:47	9
John	Voorhees	02:44	10
John	Blair	02:41	11
Peter	Kearney (Jr)	02:36	12
John	Martin	02:25	13
Don	Lindley	02:18	14
Garry	Hunter	02:18	15
Curt	Haskell	02:01	16
Tom	Nied	02:01	17
Dave	Livesay	01:48	18
Bob	Champine	01:17	19
Carl	Butsch	01:16	20
Walt	Everson	01:08	21
Del	Ogren	00:38	22
Fred	Rash	00:35	23
Bob	Warmann	00:00	24
Wayne	Trivin	00:00	25
Burr	Stanton	00:00	26
Don	Slusarczyk (Sr)	00:00	27
Joel	Plassman (Sr)	00:00	28
Jeff	Plassman (Jr)	00:00	29
Gerry	Plassman	00:00	30
Dick	Miller	00:00	31
Rich	MacEntee	00:00	32
Larry	Loucka	00:00	33
Bob	Loeffler	00:00	34
Ed	Konefes	00:00	35
Dick	Ennis	00:00	36
Jim	Buxton	00:00	37
Mike	Arak	00:00	38
Bill	Bigge	00:00	39

ORNITHOPTER Combined Ages		Best Flight	Place
Frank	Kieser	11:12	1
Don	Slusarczyk	09:55	2
Roy	White	09:24	3
Joe	Krush	06:32	4
Larry	Mzik	05:17	5
Doug	Barber	00:04	6

PEANUT SPEED		BEST MPH	PLACE
Chuck	Markos	11.21	1
George	Nunez	10.08	2
John	Blair	7.99	3
Bill	Henderson	7.18	4
Jim	Davidson	0.00	5
Doc	Martin	0.00	6
Vito	Gagliano	0.00	7
Jeff	Plassman	0.00	8
Millard	Wells	0.00	9

HAND LAUNCH STICK JUNIOR/SENIOR		Best Flight	Place
Don	Slusarczyk (Sr)	35:21	1

HAND LAUNCH STICK OPEN		Best Flight	Place
Rich	Doig	35:21	1
Larry	Loucka	32:48	2
Dan	Belieff	29:58	3
Larry	Mzik	27:16	4
Ed	Burke	15:24	5
Tom	Vallee	13:16	6
John	Marett	13:11	7
Jess	Shepherd, Jr	10:11	8
Chet	Wrzos	00:00	9
Walt	Van Gorder	00:00	10
Joe	Nuszer	00:00	11
Billie	Landrum	00:00	12
Don	Krupp	00:00	13
Jim	Grant	00:00	14
Don	Godfrey	00:00	15
Jim	Davidson	00:00	16

AJI OLD TIMER MICROFILM COMBINED AGES		Best Flight	Place
Don	Slusarczyk (Sr)	26:51	1
Larry	Loucka	22:06	2
Chuck	Markos	22:02	3
Joe	Krush	20:36	4
Wally	Simmers	20:18	5
Ron	Ganser	19:32	6
Joe	Nuszer	18:20	7
Gil	Graunke	12:28	8
Bill	Bigge	00:00	9
Dan	Belieff	00:00	10

R.O.G. CABIN COMBINED AGES		Best Flight	Place
Ron	Ganser	24:38	1
Dan	Belieff	24:08	2
Larry	Loucka	17:31	3
Tom	Vallee	13:50	4
Joe	Krush	11:05	5
Tony	Sutter	10:59	6
Don	Slusarczyk (Sr)	00:00	7
Jess	Shepherd	00:00	8
Russ	Putnam	00:00	9

R.O.G. STICK COMBINED AGES		Best Flight	Place
Dick	Obarski	14:37	1
Larry	Loucka	12:57	2
Don	Slusarczyk (Sr)	12:30	3
Joe	Krush	11:55	4
Ron	Ganser	11:13	5
Joe	Nuszer	10:23	6
John	Marett	10:09	7
Jess	Shepherd	09:30	8
John	Voorhees	07:15	9
Russ	Putnam	00:00	10
Lew	Gitlow	00:00	11
J	Davidson	00:00	12
Bill	Bigge	00:00	13

HELICOPTER COMBINED AGES		Best Flight	Place
Peter	Kearney	10:36	1
Bill	Henderson	08:24	2
Gary	Underwood	07:42	3
Larry	Loucka	06:40	4
Ron	Ganser	05:28	5
John	Marett	04:12	6
Dick	Obarski	04:05	7
Tom	Vallee	02:10	8
Pete	Staehling	00:00	9
Don	Slusarczyk	00:00	10
Chuck	Slusarczyk	00:00	11
Lew	Gitlow	00:00	12
Bill	Bigge	00:00	13

1989 AMA NATIONALS - KIBBIE DOME - MOSCOW, IDAHO

HAND LAUNCH GLIDER JUNIOR	Best Flight	2nd Flight	TOTAL (BEST 2)	PLACE
DALLAS MACE	26 4	26 2	52 6	1
SCOTT ROBBINS	23.0	23.0	46.0	2
ANDY TAGLIAFICO	0.0	0.0	0.0	3
CLINT HANNESON	0.0	0.0	0.0	4

HAND LAUNCH GLIDER SENIOR	Best Flight	2nd Flight	TOTAL (BEST 2)	PLACE
ALAN MACE	40.8	40.2	81.0	1
DAVE WARREN	34.8	31.9	66.7	2
JASON YOUCK	0.0	0.0	0.0	3

HAND LAUNCH GLIDER OPEN	Best Flight	2nd Flight	TOTAL (BEST 2)	PLACE
STAN BUDDENBOHM	77.2	77.0	154.2	1
DAN BELIEFF II	66.5	66.0	132.5	2
TOM STALICK	62.9	59.9	122.8	3
BRUCE KIMBALL	59.4	55.4	114.8	4
MARTY THOMPSON	53.7	53.2	106.9	5
DENNIS WEATHERLY	52.1	49.9	102.0	6
RICHARD PETERSON	51.9	49.9	101.8	7
KEITH VARNAU	48.5	47.3	95.8	8
STEVE GERAGHTY	45.4	42.5	87.9	9
JIM THORNBERY	39.9	39.7	79.6	10
DAVID HOOKE	39.5	36.9	76.4	11
DRAYCOTT HOOKE	35.7	35.7	71.4	12
PATRICK MEEHAN	0.0	0.0	0.0	13
MARK SEXTON	0.0	0.0	0.0	14
CHUCK SLUSARCZYK	0.0	0.0	0.0	15
JOHN BORTNAK	0.0	0.0	0.0	16

CATAPULT GLIDER JUNIOR	Best Flight	2nd Flight	TOTAL (BEST 2)	PLACE
SCOTT ROB	37.0	32.0	69.0	1

CATAPULT GLIDER OPEN	Best Flight	2nd Flight	TOTAL (BEST 2)	PLACE
STAN BUDDENBOHM	89.0	88.8	177.8	1
JOE FOSTER	71.5	68.1	139.6	2
JIM THORNBERY	68.2	65.7	133.9	3
DAN BELIEFF	65.1	62.5	127.6	4
CEZAR BANKS	59.0	56.7	115.7	5
GORDON WISNIEWSKI	56.3	56.2	112.5	6
STU BENNETT	58.6	51.8	110.4	7
AL BORER	51.2	48.4	99.6	8
DICK PETERSON	48.2	47.5	95.7	9
DENNIS WEATHERLY	48.0	47.0	95.0	10
LARRY KRUSE	47.1	46.0	93.1	11
HERB ROBBINS	35.0	34.0	69.0	12

ROG CABIN JUNIOR	Best Flight	Place
DWIGHT LARKS CLINT HANNESON	00:58	1

ROG CABIN SENIOR	Best Flight	Place
DON SLUSARCZYK JASON YOUCK	25:25	1

ROG CABIN OPEN	Best Flight	Place
RICH DOIG	17:10	1
DAN BELIEFF	17:04	2
CHUCK SLUSARCZYK	00:00	3
BOB NICHOLS	00:00	4
LARRY LOUCKA	00:00	5
JOHN BORTNAK		
BILL BIGGE		

INTERMEDIATE STICK JUNIOR	Best Flight	Place
DWIGHT LARKS	07 06	1
CLINT HANNESON	00.00	2

INTERMEDIATE STICK SENIOR	Best Flight	Place
DON SLUSARCZYK	11:09	1
DAVE WARREN	03:11	2
JASON YOUCK	00:00	3

INTERMEDIATE STICK OPEN	Best Flight	Place
CLARENCE MATHER	27:19	1
DAN BELIEFF	26:45	2
STAN CHILTON	26:06	3
EARL HOFFMAN	25:52	4
LARRY LOUCKA	25:32	5
KEN GROVES	25:03	6
WALT VAN GORDER	19:38	7
GORDY WISNIEWSKI	19:26	8
PHILLIP HAINER	18:22	9
BOB RANDOLPH	10:26	10
CHUCK SLUSARCZYK	00:00	11
DICK OBARSKI	00:00	12
BRUCE KIMBALL	00:00	13
JOE FOSTER	00:00	14
CHARLES DORSETT	00:00	15
BILL BIGGE	00:00	16

NOVICE PENNYPLANE JUNIOR	Best Flight	Place
ANDREW TAGLIAFICO	09:11	1
DWIGHT LARKS	05:14	2

NOVICE PENNYPLANE SENIOR	Best Flight	Place
DON SLUSARCZYK JASON YOUCK	08:11	1

NOVICE PENNYPLANE OPEN	Best Flight	Place
CEZAR BANKS	13:05	1
JACK MCGILLIVRAY	12:44	2
JIM CLEM	12:25	3
KEN GROVES	12:12	4
WALT VAN GORDER	11:43	5
DAVE HAGEN	11:34	6
JOE FOSTER	11:14	7
BRUCE KIMBALL	10:52	8
RICHARD MILLER	10:48	9
EARL HOFFMAN	10:16	10
BUD TENNY	10:06	11
DENNIS WEATHERLY	09:11	12
SHERMAN GILLESPIE	09:07	13
GORDY WISNIEWSKI	09:04	14
BOB OPPEGARD	08:24	15
STUART BENNETT	06:41	16
JIM THORNBERY	04:32	17
RICHARD STUART	04:29	18
KEITH VARNAU	00:00	19
FUDO TAKAGI	00:00	20
CHUCK SLUSARCZYK	00:00	21
BUD ROMAK	00:00	22
HERB ROBBINS	00:00	23
DICK OBARSKI	00:00	24
LARRY LOUCKA	00:00	25
CHARLES DORSETT	00:00	26
HANK COLE	00:00	27
BILL BIGGE	00:00	28
GORDON POLLOCK	00:00	29
BOB NICHOLS	00:00	30

HAND LAUNCH STICK JUNIOR	Best Flight	Place
DWIGHT LARKS	07 58	1
SCOTT ROBBINS	00.00	2
CLINT HANNESON	00:00	3

HAND LAUNCH STICK SENIOR	Best Flight	Place
DON SLUSARCZYK	29:40	1
DAVE WARREN	00:00	2
JASON YOUCK	00:00	3

HAND LAUNCH STICK OPEN	Best Flight	Place
JOE FOSTER	38:44	1
BOB RANDOLPH	36:07	2
RICH DOIG	29:09	3
BRUCE KIMBALL	18:25	4
WALT VAN GORDER	00:00	5
CHUCK SLUSARCZYK	00:00	6
BUD ROMAK	00:00	7
HERB ROBBINS	00:00	8
JACK MCGILLIVRAY	00:00	9
LARRY LOUCKA	00:00	10
EARL HOFFMAN	00:00	11
DAVE HAGEN	00:00	12
DON GODFREY	00:00	13
HANK COLE	00:00	14
JIM CLEM	00:00	15
STAN CHILTON	00:00	16
BILL BIGGE	00:00	17
DAN BELIEFF	00:00	18
CEZAR BANKS	00:00	19

EASY B JUNIOR	Best Flight	Place
ANDREW TAGLIAFICO	17:03	1
SCOTT ROBBINS	08:16	2
DWIGHT LARKS	04:50	3
CLINT HANNESON	00:00	4

EASY B SENIOR	Best Flight	Place
DON SLUSARCZYK	14:49	1
DAVE WARREN	03:18	2
JASON YOUCK	00:00	3

EASY B OPEN	Best Flight	Place
STAN CHILTON	23:43	1
JACK MCGILLIVRAY	23:39	2
EARL HOFFMAN	22:45	3
WALT VAN GORDER	22:01	4
JOE FOSTER	20:10	5
KEN GROVES	19:37	6
JIM CLEM	18:57	7
GORDY WISNIEWSKI	18:40	8
ANDREW TAGLIAFICO	18:38	9
BRUCE KIMBALL	16:51	10
RICHARD MILLER	16:37	11
BOB OPPEGARD	09:29	12
JAMES LONGSTRETH	08:30	13
DENNIS WEATHERLY	05:37	14
KEITH VARNAU	00:00	15
JIM THORNBERY	00:00	16
CHUCK SLUSARCZYK	00:00	17
HERB ROBBINS	00:00	18
DICK OBARSKI	00:00	19
CLARENCE MATHER	00:00	20
LARRY LOUCKA	00:00	21
DOUG HANNAY	00:00	22
CHARLES DORSETT	00:00	23
DAN BELIEFF	00:00	24
STUART BENNETT	00:00	25

1989 AMA NATIONALS - KIBBIE DOME - MOSCOW, IDAHO

FAI INDOOR & TEAM SELECTION FINALS	BEST FLIGHT	2ND FLIGHT	TOTAL (Best 2)	NATS PLACE	FINALS POINTS	REGIONAL POINTS	TOTAL POINTS	TEAM PLACE
CEZAR BANKS	41:59	41:29	1:23:28	1	1000.00	100.00	1100.00	1
LARRY CAILLIAU	40:15	40:13	1:20:28	2	964.06	100.00	1064.06	2
BOB RANDOLPH	39:44	39:44	1:19:28	3	952.08	98.51	1050.59	3
JOE FOSTER	39:03	38:18	1:17:21	4	926.72	100.00	1026.72	4
BUD ROMAK	38:32	38:04	1:16:36	5	917.73	96.42	1014.15	5
DON SLUSARCZYK (SR)	37:34	37:18	1:14:52	6	896.96	100.00	996.96	6
RICH DOIG	36:50	36:21	1:13:11	7	876.80	100.00	976.80	7
LARRY LOUCKA	35:24	33:00	1:08:24	8	819.49	96.93	916.42	8
EARL HOFFMAN	34:53	32:57	1:07:50	9	812.70	93.65	906.35	10
LEW GITLOW	33:47	33:46	1:07:33	10	809.31	100.00	909.31	9
HERB ROBBINS	32:03	30:39	1:02:42	11	751.20	79.80	831.00	11
HANK COLE	33:33	27:15	1:00:48	12	728.43	85.47	813.90	12
CLARENCE MATHER	31:03	29:06	1:00:09	13	0.00	76.04	0.00	*
DON GODFREY	26:34	26:06	52:40	14	630.99	89.96	720.95	13
WALT VAN GORDER	27:57	19:43	47:40	15	571.09	75.51	646.60	14
STAN CHILTON	30:24	14:18	44:42	16	535.54	100.00	635.54	15
KEN GROVES	22:08	18:00	40:08	17	0.00	-	0.00	
BRUCE KIMBALL	13:08	12:40	25:48	18	0.00	-	0.00	
JACK MCGILLIVRAY	24:21	00:00	24:21	19	0.00	-	0.00	
DAN BELIEFF	17:55	00:00	17:55	20	214.66	82.98	297.64	16
JIM CLEM	00:00	00:00	00:00	21	0.00	75.58	75.58	17
DAVID ARONSTEIN	00:00	00:00	00:00	22	0.00	-	0.00	

* Did not enter the Finals

INDOOR PEANUT SCALE JUNIOR	SUBJECT	BEST FLIGHT	2ND FLIGHT	Average Best 2	Scale Points	Total Points	PLACE
DWIGHT LARKS	PIETENPOL	16.8	0.0	8.4	52.50	60.90	1

INDOOR PEANUT SCALE OPEN	SUBJECT	BEST FLIGHT	2ND FLIGHT	Average Best 2	Scale Points	Total Points	PLACE
LARRY KRUSE	SANTOS DUMONT 14 bis	95.0	90.9	92.95	113.25	206.20	1
JACK MCGILLIVRAY	ISSAC'S FURY	94.0	94.0	94.00	94.00	188.00	2
CLARENCE MATHER	WITTS VEE	85.5	85.5	85.50	85.50	171.00	3
KEN GROVES	BRISTOL SCOUT D	54.0	53.8	53.90	115.08	168.98	4
MARK ALLISON	RM-12	74.9	73.5	74.20	91.83	166.03	5
SHERMAN GILLESPIE	EVANS VP1	58.0	57.8	57.90	80.25	138.15	6
CHARLES SCHAAF	WITTMAN TAILWIND	61.5	61.5	61.50	61.54	123.04	7
TOM STALICK	FIKE	58.3	55.8	57.05	58.33	115.38	8
RICHARD PETERSON	LET X2-377	52.5	52.5	52.50	52.50	105.00	9
SHERMAN GILLESPIE	GADFLY	26.3	12.1	19.20	65.33	84.53	10
SHERMAN GILLESPIE	ORD HUME DH7	0.0	0.0	0.00	73.50	0.00	11
TOM STALICK	ANDRESSON	0.0	0.0	0.00	57.75	0.00	12

INDOOR RUBBER SCALE JUNIOR	SUBJECT	BEST FLIGHT	2ND FLIGHT	AVERAGE BEST 2	SCALE POINTS	TOTAL	PLACE
DWIGHT LARKS	PC6	30.5	24.2	27.3	51.00	78.35	1

INDOOR RUBBER SCALE OPEN	SUBJECT	BEST FLIGHT	2ND FLIGHT	AVERAGE BEST 2	SCALE POINTS	TOTAL	PLACE
LARRY KRUSE	SANTOS DUMONT 14bis	83.7	82.3	83.00	91.500	174.50	1
KEN GROVES	BRISTOL SCOUT D	65.6	58.5	62.05	90.000	152.05	2
DAVID ARONSTEIN	CESSNA CARAVAN	90.0	114.1	90.00	52.500	142.50	3
CLARENCE MATHER	TIPSY JR	62.5	59.4	60.95	74.830	135.78	4
SHERMAN GILLESPI	GADFLY	47.8	45.5	46.65	75.333	121.98	5
CHARLES SCHAAF	LACEY M10	42.9	16.9	29.90	72.833	102.73	6

PENNYPLANE JUNIOR	Best Flight	Place
SCOTT ROBBINS	07:36	1
DWIGHT LARKS	05:35	2

PENNYPLANE SENIOR	Best Flight	Place
DON SLUSARCZYK	12:25	1
JASON YOUCK	00:00	2

PENNYPLANE OPEN	Best Flight	Place
JOE FOSTER	14:34	1
GORDY WISNIEWSKI	13:52	2
BRUCE KIMBALL	12:59	3
LARRY LOUCKA	12:29	4
HANK COLE	12:07	5
KEN GROVES	11:54	6
WALT VAN GORDER	11:53	7
BUD TENNY	10:51	8
DENNIS WEATHERLY	10:11	9
JIM CLEM	09:58	10
SHERMAN GILLESPIE	09:44	11
DOUG HANNAY	08:38	12
GORDON POLLOCK	08:35	13
BOB OPPEGARD	04:38	14
CHUCK SLUSARCZYK	00:00	15
DAVE HAGEN	00:00	16
CHARLES DORSETT	00:00	17
BOB NICHOLS	00:00	18

MANHATTAN CABIN JUNIOR	Best Flight	Place
DWIGHT LARKS	01:37	1
CLINT HANNESON	00:00	2

MANHATTAN CABIN SENIOR	Best Flight	Place
DON SLUSARCZYK	07:11	1
DAVE WARREN	00:00	2

MANHATTAN CABIN OPEN	Best Flight	Place
WALT VAN GORDER	10:21	1
LARRY LOUCKA	09:38	2
BOB NICHOLS	09:32	3
KEN GROVES	08:54	4
JAMES LONGSTRETH	05:26	5
STUART BENNETT	04:55	6
FUDO TAKAGI	00:00	7
CHUCK SLUSARCZYK	00:00	8
BUD ROMAK	00:00	9
RICHARD PETERSON	00:00	10
BRUCE KIMBALL	00:00	11

ORNITHOPTER COMBINED AGES	Best Flight	Place
FRANK KIESER	09:33	1
ROY WHITE	09:30	2
DON SLUSARCZYK (Sr)	08:55	3
SCOTT ROBBINS (Jr)	04:28	4
WALT ERBACH	03:15	5
PAT DESHAYE	02:38	6
GORDON POLLOCK	01:59	7
DWIGHT LARKS (Jr)	00:28	8

1990 - INDOOR SURVEY

I am interested in Indoor activity as a:

Competitor____, Enthusiast/Supporter____, Sport Flyer_____.

I am a member of: AMA____, NFFS____.
NIMAS____ SAM____ FAC____ MECA____ OTHER____.

INTERESTS:

HLG/Catapult G. ___
NPP/PP ___
Easy B ___
Ultra Lite (microfilm type)___
Bostonian/No-Cal ___
P-Nut/AMA Scale ___
Manhattan/Orn/ Helicopter ___
Intermediate STK ___
ROG (Cabin)/STK ___
Other _____
R/C Soaring _____
Other R/C _____

CONTESTS I HAVE ENTERED:

1 to 3 in 1989___ over 3___
1 to 3 in 1988___ over 3___
1 to 3 in 1987___ over 3___
1 to 3 in 1986___ over 3___

On an overall average, how much do you estimate you spent on Indoor Modeling (exclusive of travel expenses).
1989 _____ 1988 _____
1987 _____ 1986 _____

Have you traveled over 300 miles (one way) to a contest during these years? _____

How many Indoor Models of all types did you build in:
1989 _____ 1988 _____ 1987 _____ 1986 _____

AGE GROUP: JR. ___ SR. ___ OP. ___
Under 30 ___ Under 50 ___ Over 50 ___

**********PLEASE PRINT!**********

OCCUPATION: _____

REMARKS: _____

_____

_____

_____

NAME: _____

ADDRESS: _____

CITY, STATE ZIP: _____

PHONE: _____

FILL OUT & SEND ASAP TO: NFFS Survey, 1655 Revere Dr, Brookfield, WI 53005 USA

1990 - OUTDOOR SURVEY

I am interested in Outdoor activity as a:

Competitor____, Enthusiast/Supporter____, Sport Flyer_____.

I am a member of: AMA____, NFFS____.
NIMAS____ SAM____ FAC____ MECA____ OTHER____.

INTERESTS:

HLG/Catapult G. ___
Towline Gliders ___
Mulvihill/
Wakefield ___
Electric ___
CO2 ___
Cargo/Payload ___
Pee Wee 30 ___
Coupe ___
P-30 ___
Scale ___
Orni/Rub.Speed ___
1/2 A Power ___
A Power ___
B Power ___
C Power ___
D Power ___
FIC Power ___
FAI Events (only)___
R/C Soaring ___
Other R/C ___
Other ___

CONTESTS I HAVE ENTERED:

1 to 3 in 1989___ over 3___
1 to 3 in 1988___ over 3___
1 to 3 in 1987___ over 3___
1 to 3 in 1986___ over 3___

On an overall average, how much do you estimate you spent on Outdoor Modeling (exclusive of travel expenses).

Have you traveled over 500 miles (one way) to a contest during these years?

How many Outdoor Models of all types did you build in:
1989___ 1988___ 1987___ 1986___

AGE GROUP: JR.___ SR.___
Under 30__ Under 50 __Over 50__

**********PLEASE PRINT!**********

OCCUPATION: _____

REMARKS: _____

_____

_____

_____

NAME: _____

ADDRESS: _____

CITY, STATE ZIP: _____

PHONE: _____

AMA NATIONALS
combined with
NINTH UNITED STATES INDOOR CHAMPIONSHIPS

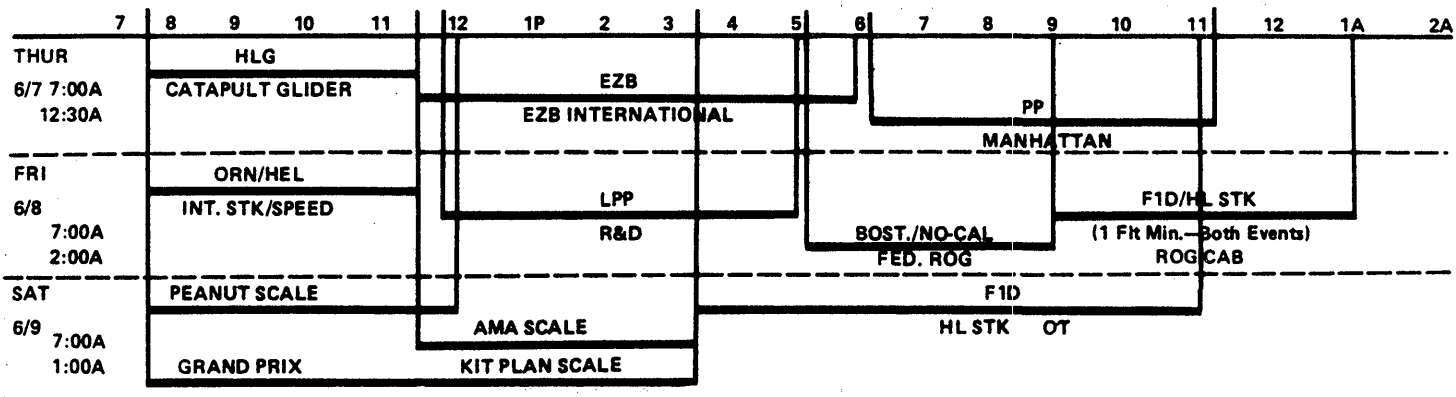
June 7, 8, 9, 1990

East Tennessee State University
"Mini-Dome"
Johnson City, TN

Sponsored by
National Free Flight Society/Academy of Model Aeronautics

Send entry payable to:
USIC, 1655 Revere Drive, Brookfield, WI 53005
(414) 782-6256 (after 7 pm Milwaukee time)

CATEGORY IV



TABLES AND CHAIRS

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

LIGHTING

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

SCALE JUDGING

Models must be submitted with documentation and contestant's name—Peanut Scale by 12:00 noon, Friday, June 8; AMA Scale by 5:00 pm, Friday, June 8. Judging will be performed by independent judges.

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

Included will be Pistachio, Coconut, and George Bush-Grumman Avenger (one design) events.

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

All 1990/1991 AMA rules apply. All rule change "proposals" DO NOT APPLY!

PRACTICE

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

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

(Ceiling—116', floor—208' x 420')

Astro-turf may not be on floor.

Helium available, bring your own balloons.
NOTE: Helium belongs to all fliers—please lend your balloon to others.

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

Entries must be postmarked by **MAY 12, 1990.** Late fee **$10.00 payable on site.**

PENNYPLANE FLIERS

The new **20" overall total length** may disqualify your present model. It is your responsibility to comply—please check **before** the contest. No model **part** shall extend beyond 20.00000 inches.

EBZ International event is only for foreign fliers with models built to the rules of their country. USA and Canadian fliers not eligible due to no weight limit.

NATS/USIC GRAND CHAMPION

If you wish to participate in the Grand Champion Award, you must select a maximum of seven events for score. Your declaration must be made **before** you fly any events whatsoever.

EVENTS ELIGIBLE: HLG, F1D, H.L. STK, ROG CAB, ORN, EZB, INT. STK, P-NUT, AMA SC, PP, LPP, MAN, HEL, BOST.

AJI OLD TIMER (OT)

STICK ONLY (Microfilm covered). Design must have been widely published between 1/1/34 and 12/31/42 (bring proof). Construction must be in accordance with plan (balsa sizes may vary). No hi-tech material will be allowed, nor "new" devices such as variable pitch or diameter propeller. Can formed propeller is permitted.

BOSTONIAN

Models must be turned in for judging by 4 pm, Friday, June 8.

AWARD LEVEL				
EVENT		JR	SR	OPEN
NATS	BOST.			6
NATS	EZB	4		8
NATS	F1D			6
NATS	HELI			3
NATS	HLG	3	3	6
NATS	HL STK	3		5
NATS	INT. STK	3		6
NATS	LPP	3	3	8
NATS	PP	3		6
NATS	MANHATTAN			6
NATS	ORNI			3
NATS	ROG CAB			3
NATS	P-NUT SCALE	3		6
NATS	AMA SCALE			4
USIC	CAT. GLIDER			6
USIC	EZB INT'L.			5
USIC	FED. ROG			4
USIC	KIT PLAN SCALE			6
USIC	NO-CAL			5
USIC	OT			3
USIC	P-NUT SPD			–
USIC	R&D			3
USIC	UNL. SPEED			–
USIC	GRAND PRIX			–

F1D AND AMA H.L. STICK

This year it is **not permitted** to have one flight apply to two events. Each event must be separately flown.

R&D

1. Span (maximum)–18".
2. Overall length (maximum)–20. NOTE: Consider a model which would fit into a box 20 x 18 x 18.
3. No area limitation.
4. Weight (minimum)–3.1 gram.
5. Single, multi or continuous surfaces are permitted.
6. No microfilm.
7. Configurations not permitted–helicopter, autogiro, ornithopter, etc.
8. Any bracing is permitted.
9. Tractor, pusher, canard, or whatever is permitted.
10. Hand launched or ROG permitted.
11. Any "gadget" permitted.
12. No dropping of parts.
13. Model must be rubber powered.
14. Any quantity of motivation devices permitted.
15. If there are any rules not covered above, then remaining **AMA 1990** published apply.
16. Models will be judged solely on a duration basis, i.e., best of three official flights.
17. Sixty seconds minimum required for an official flight (unlimited attempts).
18. Model must be presented to CD (prior to test flying) for final decision on acceptance of design for competition for reason of safety (to the CD, as well!).
19. Maximum of two essentially **identical** models permitted to complete official flights.
20. Other designs may be entered separately, but only highest time is considered for placing.
21. NOTICE: The top six places **must** provide the NFFS (free of charge, et al) with a full-size reproducible plan along with written details of the model and all of its features, 30 days from close of USIC 1990.

CATAPULT GLIDER

1. Maximum wing span–12".
2. Maximum wing chord–3".
3. Maximum launching stick length–6".
4. Nine official flights.
5. Sum of best two flights determines winner.

KIT/PLAN SCALE

Turn in plan and plane by 7:30 AM, Saturday, June 9.

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

NO-CAL PROFILE SCALE

1. A recognizable model of a full-scale aircraft, with a wing span not exceeding 16".
2. The weight of the model (excluding the rubber motor) shall be no less than 6.2 grams (two pennies).
3. No fancy gadgets permitted–plastic prop is permitted. Balsa and Jap tissue shall be the main construction materials. Use of hi-tech materials such as carbon fibre, boron, et al is not at all permitted.
4. Model must contain control surface outlines, window outline, and registration markings. Model must have full landing gear, i.e., as the full-scale aircraft (no profile gear).
5. Win based on best of five flights (20 second minimum and 2 attempts/flight).

UNLIMITED RUBBER SPEED AND PEANUT SPEED

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

FEDERATION ROG

1. Model must be rubber powered and propeller driven.
2. All flight ROG and weight at 3.1 gram minimum.
3. Molded plastic propeller–6" diameter maximum. (Bushing may be added and prop sanded but no cutouts.)
4. Projected wing area–30 square inches maximum.
5. Projected stab area–maximum of 50% of wing area.
6. Landing gear must support model with two wheels of 1/2" diameter minimum and turn freely at all times.
7. Minimum flight of 20 seconds counts–best flight of five determines winner.
8. No restrictions on covering, dimensions, or construction. All ballast must be permanently affixed.
9. One hi-time award and three places for two man by state team.

1990 USIC/NATS

DORMITORY: Air-conditioned. Room rate is $21.00 per room per night. It is your responsibility to arrange for a room mate if you want one. No linens are furnished. If you desire linens, they can be provided for $6.25 per person for the period. This includes a set of towels (no blankets). You must indicate your needs and pay USIC (not ETSU). USIC is being held responsible for the payment, so USIC must be kept informed of all plans and any change of plans. NOTE: If you lose the room key or do not turn it back in, there is a *$25.00 charge!* (A key ring might be helpful). It is your responsibility to find a room mate ETSU will have an admissions person at the dormitory. Lavatory/shower facilities are located on each floor. The Dormitory is named LUCILLE CLEMENT HALL (located at west end of Dossett Drive.).

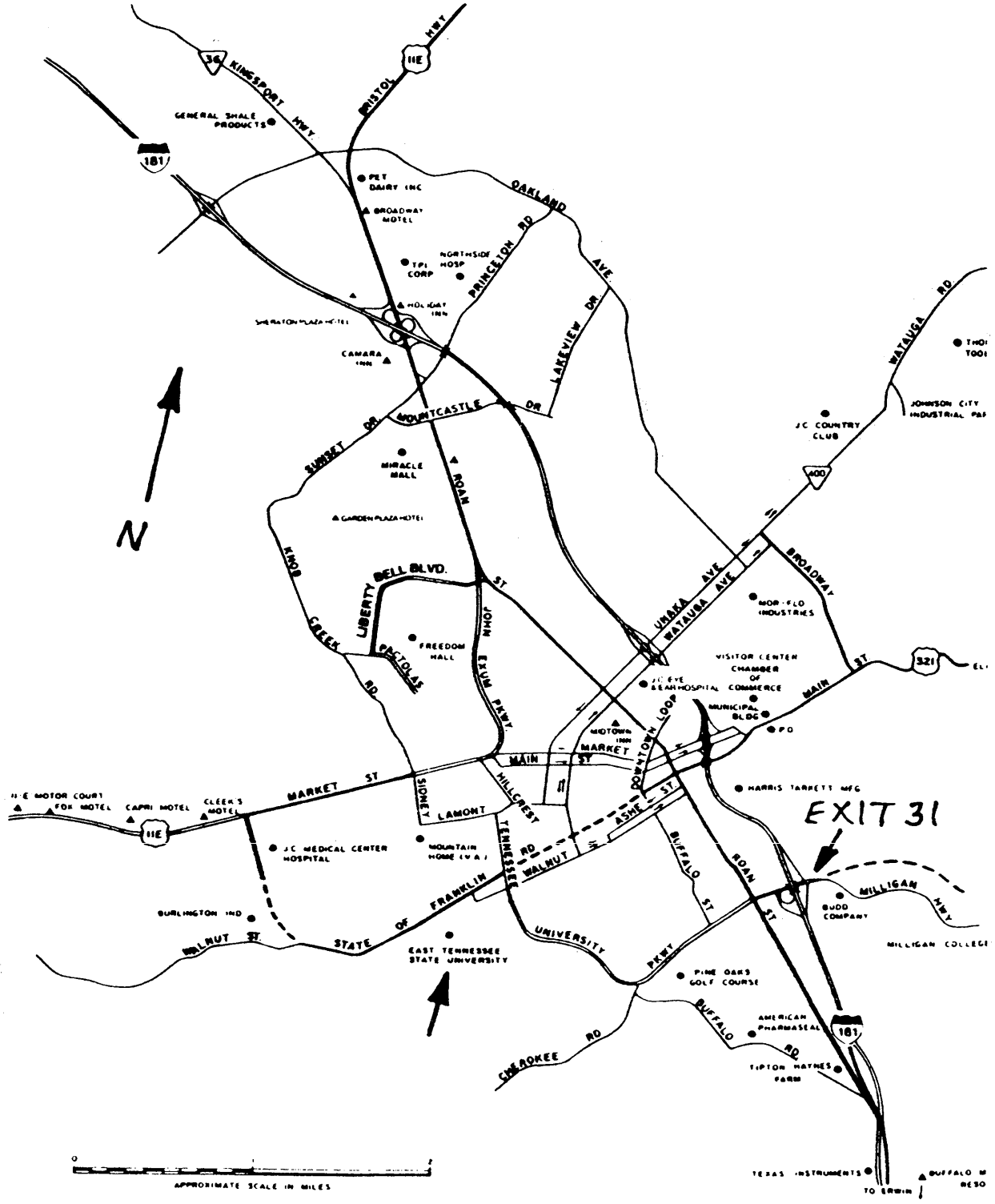
The dormitory provides special areas for married couples, so please indicate as needed.

DORMITORY CHECK-IN HOURS:
June 2 through June 8–5 to 7 pm and 8 to 11 pm.

CHECKOUT:
Turn key into Dormitory manager or slip under managers door along with slip containing your name and checkout time.

ENTRANCE DOOR to the Mini-Dome will be on the lower level and marked. The door is on the west side of the Dome directly across the street from the parking areas.

NOTICE, NOTICE: By law **NO** liquor or beer is allowed on the campus. ABSOLUTELY NOT!! If you break this rule, you will be fully disqualified from **all** events and forfeit all fees, and also be subject to any State of TN actions! PLEASE watch for and adhere to posted speed limits on campus.



LODGING

BROADWAY MOTEL, INC. P.O. Box B-CRS, 37602. 2608 N. Roan Street, 615-282-4011. 80 Units

CAPRI MOTEL P.O. Box 5114-EKS, 37603, 3008 W. Market Street, 615-926-2952. 12 Units.

CLEEK MOTEL 2700 W. Market Street, 37601, 615-926-8145. 44 Units.

COMFORT INN 1515 US 19-E By-Pass, Elizabethon, TN, 615-542-4466, 1-800-228-5150. 58 Units.

11-E MOTEL Rt. #3, Box 451, 37604, Hwy. 11-E & 321 South. 615-928-2131. 25 Units.

ECONOMY INN 106 W. Millard Street, 37601, 615-926-4131. 112 Units.

FAIRFIELD INN 207 East Mountcastle Dr., 37601. Reservations: 1-800-845-2839, 615-282-3335. 132 Rooms.

FAMILY INNS OF AMERICA At Buffalo Mountain Resort, Route 2, 100 Country Club Dr., Unicoi, TN 37692, 615-928-6531. 69 Units.

FOX MOTEL 3406 W. Market St., 37604. 615-928-0267. 22 Units with kitchen.

***GARDEN PLAZA HOTEL** 211 Mockingbird Lane, 37601, 615-929-2000. 187 Units.

HOLIDAY INN-JOHNSON CITY 2406 N. Roan Street, 37601, 615-282-2161. 197 Units.

JONESBOROUGH BED & BREAKFAST P.O. Box 722, Jonesborough, TN 37659, 615-753-9223. 8 Rooms.

ROBERTSON HOUSE 212 E. Main St., Jonesborough, TN 37659, 615-753-3039. 3 Units.

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SUPER 8 MOTEL 108 Wesley Street, 37601, 615-282-8818. 63 Units.

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NAME	SINGLE	DOUBLE
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Family Inns of America	$22.00	$27.00
Fox Motel	$30.00	$41.00
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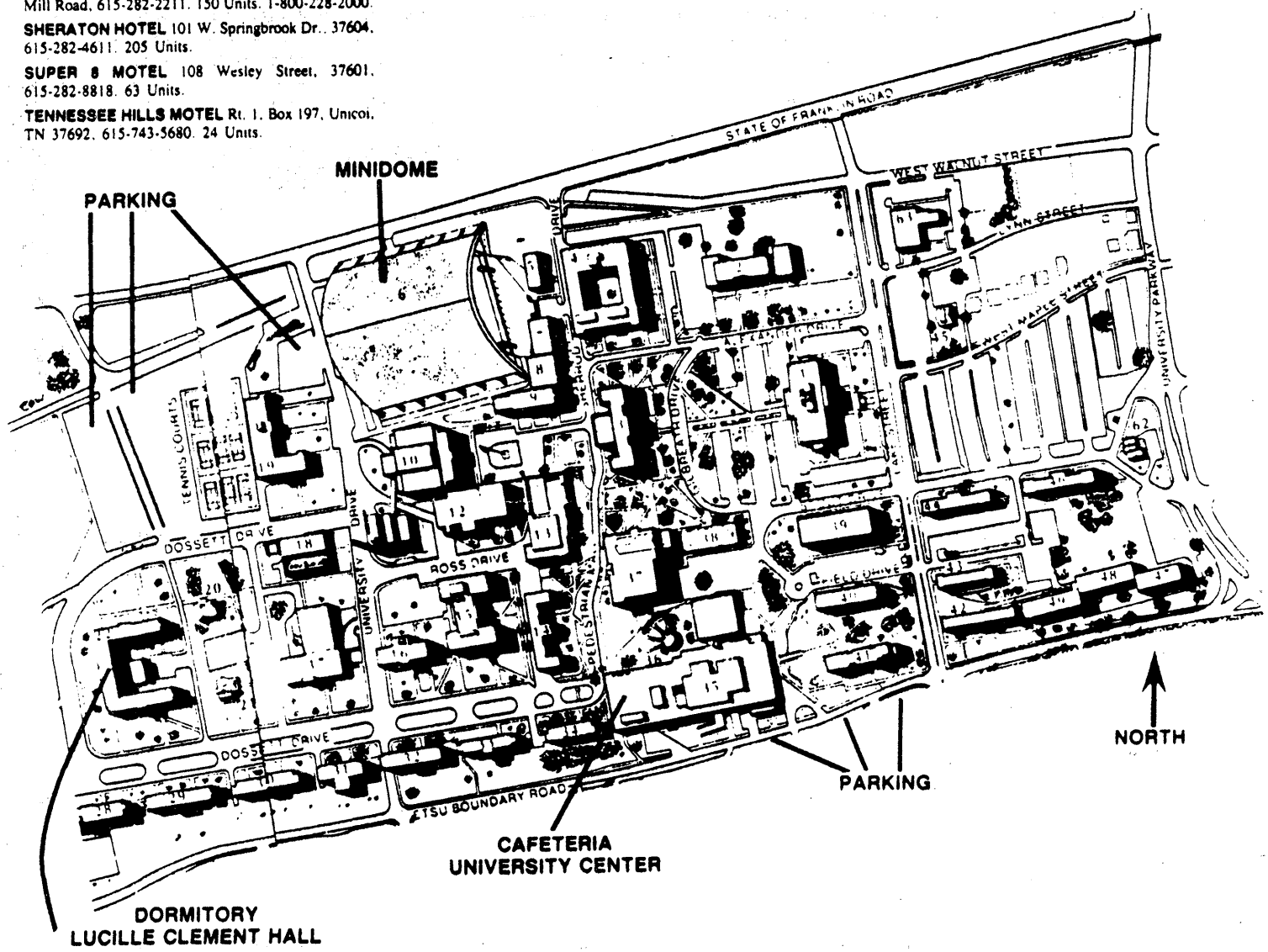
Holiday Inn	$48.00	$48.00
Sheraton Hotel	$62.00	$72.00
Super 8 Motel	$32.00	$38.00

These are 1988 rates!

When calling for reservations state you are part of USIC for possible special rate. All rates are plus tax.

*(Garden Plaza Hotel is the host hotel for USIC. Special rate is $55.00 plus tax for a very attractive room. State you are part of USIC. Suggest you make reservation by May 1, 1990.



AMA NATIONALS
combined with
NINTH UNITED STATES INDOOR CHAMPIONSHIPS

JUNE 7, 8, 9, 1990

EAST TENNESSEE STATE UNIVERSITY
"MINI-DOME"
JOHNSON CITY, TENNESSEE

NFFS

AMA

PLEASE PRINT

NAME _____ AMA NO. _____
Last First Initial

STREET _____ JUNIOR _____ SENIOR _____ OPEN _____

CITY _____ STATE _____ ZIP _____

PHONE _____

I hereby certify that I understand all of the rules under which I will compete and will diligently follow the official AMA safety code as well as any that may be established on site as well as apply the use of good accepted common sense in all my flying and affairs at the contest site.

Signature _____

FEES:

ENTRY—$20.00 Open _____
1.00 Junior and Senior

EVENTS—$5.00 each—Open _____
.50 each—Junior and Senior

BANQUET (see below) _____

DORMITORY _____

TOTAL _____

CHECK FOR TOTAL FEES ENCLOSED _____

Are you a member of NFFS ☐ Yes ☐ No

Foreign entrant must include $10.00 insurance fee

World Championships Banquet @ $20.00 (Sheraton Plaza, June 6)

Dormitory at ETSU reservation:
Daily room rate is $21.00 (2 beds). Linens (includes one set of towels) at $6.25/person. Change of linens @ $6.25.

Please indicate reservation in appropriate block:

June	2	3	4	5	6	7	8	9	10
1 Room									
2 Rooms									
Linens									

CIRCLE EVENTS ENTERED

NATS A. GRAND CHAMPION*
201 Hand Launch Stick
202 Intermediate Stick
203 F1D
204 ROG Cabin
205 Manhattan
206 EZB
207 Pennyplane
208 Limited Pennyplane
209 Helicopter
210 Ornithopter
212 Hand Launch Glider
215 Bostonian
505 Peanut Scale
507 AMA Scale

USIC
1. Catapult Glider
2. EZB International
3. Federation ROG
4. Kit/Plan Scale
5. No-Cal
6. Old Timer
7. Peanut Speed**
8. Unlimited Speed**
9. R&D
10. Grand Prix (enter on site)

*Indicate "GC" in front of 7 selected AMA events.

**Sponsored by Hardy Brodersen—$5/each mph over 6 mph to winner only ($100 maximum).

In case of emergency please contact:

NAME _____ PHONE _____

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CITY _____ STATE _____ ZIP _____

Send fees payable to: USIC
1655 Revere Drive
Brookfield, WI 53005

Must be postmarked by May 12, 1990
Late entry fee of $10.00 payable on site.

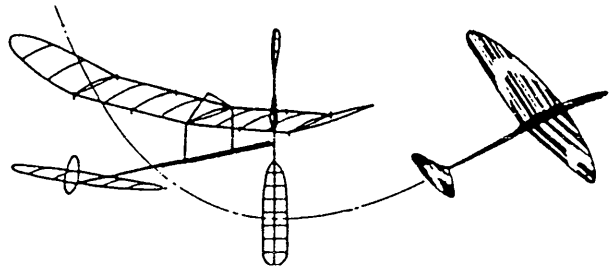
NOTE: You can join NFFS and AMA on premises.
It is best if you join NOW!

The Voice of N.I.M.A.S.

INDOOR

NEWS and VIEWS

FEBRUARY - 1991 #53 , 54 , 55



FUTURE EDITOR: Plenny Bates, 2505 White Eagle Trail, SE, Cedar Rapids, IA 52403

Editor: Frank Kieser - 2595 Whippoorwill Lane, Vero Beach. FL 32960 (407) 569-7812

CO-EDITOR: A.J. Italiano - 1655 Revere Drive, Brookfield, WI 53045

NEWSLETTER INFO

Here is my third issue of INAV. I have received many encouraging comments from our subscribers which I appreciate. I always encourage comments and suggestions and particularly welcome articles and items that I can publish. I will try to answer your letters, but I am not always prompt. You will probably notice some changes in format and mailing. These have been made with an eye towards reducing publishing and mailing costs without sacrifice in quality.

In my last mailing, I had an error due to changes I made in my mailing progam. As a program manager I worked with many years ago said, "Improvements will kill us". I think I corrected the error by mailing out additional copies but if any of you didn't receive issue #51 & 52, let me know and I will send you a copy. For that matter if you ever have a question about your subscription status, speak up! You probably know that the issue number on which your subscription expires is to the right of your mailing address and there is a box for subscription status later in this issue.

One other slip in the last issue was the omission of ROG CABIN in the USIC results. This was brought to my attention by several of my good friends. I could say that it was intentional to see if you were reading what I wrote but in reality, it got misplaced when I was rearranging the many events to best fit the space. Fortunately I found the results and they appear further on.

GOOD NEWS - 1992 USIC

You all know that at the last USIC, Tony Italiano announced that he would not be running next years event and was looking for someone to do the job. Well, Chuck Slusarczyk has come forward and volunteered his services as overall Administrator and Contest Director of the 1992 United States Indoor Championships. June 4-7, 1992. All of us who know Chuck know that he will do a splendid job. So lets all get behind Chuck and lend our support in whatever way we can. You can contact Chuck at:

Chuck Slusarczyk
4200 Royalton Road
Brecksville Ohio 44141
(216) 526-8613

LAKEHURST

The East Coast Indoor Modelers headed by Gary and Kit Underwood ran a splendid season at Lakehurst this past summer, the highlight being the the World Championship team selection over the Labor Day week-end. The results and a commentary by Cezar Banks is covered in this issue. I was unable to attend the Labor Day event, but I did get there for a flying session on Sept. 15. There was a good turn out and an excellent day of flying.

1991 FREE FLIGHT HALL OF FAME

The National Free Flight Society has announced the recipients of the Free Flight Hall of Fame for 1991. One recipient is well known to indoor modelers. He is RICHARD W. OBARSKI. The citation reads as folllows:- A versitile fellow with excelllence in both indoor and outdooor activities. An early member of the Chicago Aeronuts he worked very hard at scoring high in competitions. His list of wins is very long. As an engineer, he developed new types of product test equipment. He also developed and produced products for the model trade. - CONGRATULATIONS DICK

1992 NATS

The 1992 National Championships both indoor and outdoor will be held at Westover Air Force Base at Chicopee, MA June 20-28, 1992. The championships were last held there in 1983. The indoor site is an Air Force hanger with a 61 foot height (Cat III) at the center.

1992 F1D POSTAL CONTEST

I received a letter from Tom Vallee dated Sept 20, 1991. The following are some excerpts from that letter:

The Japanese indoor flyers are planning to evaluate a new sports complex in Izumi City. The Izumi dome has a ceiling of 45 meters and ample floor area. If available this may prove to be a world class flying site.

Have passed on Mr. Shigeyoshi Nonaka's hopes that Bob Randolph will field a team in next years Japan vs United States F1D (Indoor FAI) postal contest. Bob has accepted.

This means we should have at least 2 teams from each country. Mr. Nonaka has advised me thatnext years meet will be considered a major contest in Japan.

The rules for the contest are simple.

1. Three man teams.
2. F1D (FAI Stick) flown according to FAI rules, 6 rounds over one or two days.
3. Cat. I. No fudge factors, best time wins.

The idea of the contest is to provide more flyers a chance to engage in serious international competition. Any person wishing to field a team should contact me. We need more teams and flyers. I assume the contest would be some time after next years world championships.

Thomas Vallee, 444 Henryton So.
Laurel, MD 20724

1991 F1D FINALS TEAM SELECTION RESULTS - LAKEHURST HANGAR #1 - AUG 31 TO SEPT 2, 1991

CONTESTANT	ROUND 1	ROUND 2	ROUND 3	ROUND 4	ROUND 5	ROUND 6	ROUND 7	ROUND 8	ROUND 9	BEST FLIGHT	SECOND FLIGHT	TOTAL BEST 2
Rich Doig	00:34:14	00:40:15	00:38:19	--	00:30:17	00:40:07	00:43:28	00:24:54	00:44:06	00:44:06	00:43:28	01:27:34
Cezar Banks	00:32:12	00:36:54	00:49:00	--	--	--	--	--	--	00:49:00	00:36:54	01:25:54
Larry Loucka	--	00:18:18	00:39:27	--	--	00:28:53	00:30:07	00:35:00	att	00:39:27	00:35:00	01:14:27
Don Slusarczyk	--	00:12:57	00:35:13	00:37:38	00:06:52	00:31:33	--	00:32:40	00:33:57	00:37:38	00:35:13	01:12:51
Larry Cailliau	00:12:07	00:36:56	00:35:16	--	00:20:39	att	--	00:09:33	00:11:28	00:36:56	00:35:16	01:12:12
Bud Romak	--	00:35:24	--	--	00:12:02	00:31:27	00:26:07	00:34:31	00:29:51	00:35:24	00:34:31	01:09:55
Bill Hulbert	--	00:28:20	00:21:41	--	00:17:24	00:34:15	00:29:07	00:34:31	00:32:42	00:34:31	00:34:15	01:08:46
Chuck Slusarczyk	--	--	00:12:01	--	--	--	00:29:33	00:27:03	00:35:20	00:35:20	00:29:33	01:04:53
Jesse Shepherd, Jr.	--	00:26:38	00:35:36	00:19:04	00:28:09	00:28:45	00:24:21	00:13:37	00:12:16	00:35:36	00:28:45	01:04:21
Tom Vallee	00:15:54	--	00:00:07	--	--	00:32:41	00:31:21	att	00:01:04	0032:41:	00:31:21	01:04:02
Don Belieff	--	00:31:12	00:13:29	--	--	00:20:30	00:32:41	00:23:06	00:20:13	00:32:41	00:31:12	01:03:53
Bob Gibbs	--	00:26:46	00:27:52	--	00:29:39	00:24:42	00:28:30	00:22:21	att	00:29:39	00:28:30	00:58:09
Bob Randolph	00:10:05	att	att	--	--	att	att	00:25:17	00:22:45	00:25:17	00:22:45	00:48:02
Larry Mzik	--	--	--	--	--	--	--	--	--	00:00:00	00:00:00	00:00:00

1991 F1D FINALS TEAM SELECTION RESULTS

CONTESTANT	FINALS PLACE	FINALS POINTS	REGIONAL POINTS	LOCAL POINTS	TOTAL POINTS	TEAM PLACE
Rich Doig	1	1000.00	100.00	10.00	1110.00	1
Cezar Banks	2	980.97	100.00	10.00	1090.97	2
Larry Loucka	3	850.21	100.00	10.00	960.21	3
Don Slusarczyk	4	831.94	100.00	9.82	941.75	4
Larry Cailliau	5	824.51	100.00	10.00	934.51	5
Bud Romak	6	798.44	97.07	0.00	895.51	6
Bill Hulbert	7	785.31	96.13	10.00	891.43	7
Chuck Slusarczyk	8	740.96	77.81	8.18	826.95	9
Jesse Shepherd, Jr.	9	734.87	100.00	10.00	844.87	8
Tom Vallee	10	731.25	75.90	9.97	817.12	11
Don Belieff	11	729.54	77.92	10.00	817.45	10
Bob Gibbs	12	664.07	99.25	9.47	772.78	12
Bob Randolph	13	548.53	100.00	10.00	568.53	13
Larry Mzik	14	0.00	80.64	8.98	89.62	dnf

1991 USIC/NATS --- ROG CABIN ---
CD: CHARLIE SOTICH

CONTESTANT	BEST FLIGHT	PLACE
Ron Ganser	00:24:26	1
Larry Loucka	00:23:05	2
Anthony D'Alessandro	00:20:38	3
Joseph Krush	00:19:17	4
Dan Belief	00:17:14	5
Tom Iacobellis	00:16:11	6
Tony Sutter	00:13:43	7
John Marret	00:10:29	8

THE ABOVE RESULTS OF USIC ROG CABIN
WERE INADVERTANTLY OMITTED FROM
THE PREVIOUS ISSUE OF INAV

1992 F1D TEAM SELECTION FINALS
LAKEHURST N. J. - LABOR DAY WEEKEND
AUGUST 31, TO SEPT. 2, 1991

By Cezar Banks

First Contest Day: HOT AND MUGGY; 85% R.H. and 85-87 deg. F. Air was somewhat gusty up to 100 ft. in round one, less so in round two, and smooth in round three. Only five fliers (of 13 active contestants - down from the usual 20 finalists) posted times in round one amid much muttering about air conditions. Doig was best with a 34:14. My model got to about 100 ft. at the seven minute mark, then intersected gusty air once each flight circle and found itself down to 50 ft. at nine minutes. It did climb back up to 75 ft. but scored only 32:27. Round two gustiness was more moderate and only up to about 50 ft.. Drift above that altitude was often sever however, requiring frequent steering. Steering was sometimes challenging to say the least because of the floor layout i.e. the carrier deck, parked aircraft,myriad stores and boxes and fenced off areas with limited ingress/egress. Still, it was the same for everyone and this time ten fliers posted scores. Doig again was showing the way with an excellent 40:15 to put him first. My flight was lackluster, notable only for a lot of steering, over one minute of it with prop stopped, and scored only a modest 36:54. Nevertheless, the air was getting smoooother -- so-- on to round three. I launched a bit before 6:00 PM. After watching it the first few minutes, I was convinced I had under-motored badly based on its rate of climb and prop rpm. But to my growing surprise and delight the darned thing just kept climbing, slowly but relentlessly, topping out at about 130 ft. at 20 plus minutes. It stayed at that altitude past the 30 minute mark, now and then drifting toward the south wall and then back away again always just shy of where steering would have been mandatory. It then started a steady drift westwhere it continued in super air. A pole steer helped clear some 12 ft. high boxes and it finally hit a box at about 18 inches altitude and settled down for a new record, 49 minutes even, verified by four different watches. Oh, what a feeling! Numb? Shocked? Happy? Yes, all that and more. The best air of the meet I thought, yet I was the only one in round three to catch it. Loucka did make his presence and intent known however with a strong 39:27.

Second Contest Day: COOLER-NOT MUGGY; 75-77 deg F. & 50% R.H.. Very windy outside which made it so dratty inside that it was almost unflyable. CD Harlan extended the fourth round but still only two flyers posted scores. Nineteen year old Don Slusarczyk showed it could be done by recording a 37:38 in round four to move into third place. Round five conditions continued to be poor but now seven flyers posted scores, more out of desperation than anything esls, I think. Of these only Doig broke 30 minutes. The muttering grew. Round six conditions were much improved but still far from ideal. Doig took the round again with 40:07 to give him a stronghold on #2 spot and we were all looking at him with new eyes now. He wasn't done yet though as he continued to amaze us even more the next day. Slusarczyk and Cailliau were third and fourth with Loucka and Romak at their heels. Early team spot favorite Randolph ran into nothing but grief when his models developed a severe case of longitudinal instability at launch torque which plagued him throughout the meet. Now only one day left. What would conditions be?

Third Contest Day: BIT WARMER - NOT MUGGY - MUCH LESS WIND; More like second day than first but lesser winds from a different direction made all the difference. All in all, fair to good flying in rounds seven and eight turning to very good to excellent late in round nine. I kept two ships ready to fly "just in case" but didn't need to.to assure a team position. Doig sustained his magic with two super flights in rounds seven and nine of 43:28 and 44:06 to clinch first team spot. I held second and Loucka posted a 35:00 in round eight to gain the third spot. Five or six guys took a shot at him in round nine but came up short.
Footnote: Hangar 1 is a marvelous enclosure but it has some bad air leaks, the most serious being the west door where a six inch gap exists around its whole periphery. This makes conditions inside a virtual slave to weather outside to a higher degree than other airship hangars I have flown in. But, as bad as it can get, it can also get "super good" too. No way would I have scored 49 minutes without lots of thermal help. In fact, Bud Romak, flying around 7 PM Monday in a "just for the heck of it unofficial round ten" had a flight of 49 1/2 minutes!! Also Walt Van Gorder did 25 minutes plus for a new EZB record about the same time Bud was flying! So you can see what is possible. Nevertheless, even though I am the lucky recipient of "super air", I prefer fairer sites. Two good examples are Johnson City and Moscow, Idaho which are fairly tight and have gobs of insulation in their ceilings. This means a much smaller temperature differential between floor and ceiling which means much lower velocity vertical convection currents which means insignificant or no thermals.

VANGORDER SETS EZB RECORDS

Twice within a month, Walter Van Gorder set new EZB records. Both were at Lakehurst, N.J. the first on August 3, 1991 at 6:30 PM and both were with his model "PIECES" which was built in 1981. He published a very excellent and detailed construction article of this model in the January 1982 issue of Model Aviation. The model had been recovered replacing the original condenser paper with mylar film. The original prop which had a 13 inch diameter and was quite flexible was replaced with a stiffer 14 X 27.3 inch prop. The time for the first record was 24:15. The model weighed .755 grams and the motor which was FAI Tan rubber .040-.042 X 17-1/8 weighed.752 grams. The motor was wound to 2320 turns and landed 380 turns for an average of 80.33 RPM.

The second record of 25:58 was set on Labor Day, Sept. 2, 1991 at 5:58 PM. The wing was replaced with a lighter wing that had been braced with diagonal supports from the wing posts to the leading and trailing edge spars and the condenser paper was replaced with mylar. The same 14 inch prop was used. The model weighed .745 grams and the motor which was now 1981 Pirelli .042-.043 X 17-1/2 weighed .775 grams. The motor was wound to 2300 turns plus 8 turns hand wound. 280 turns left for an average Of 79.28 RPM. Walt tells me it won't be long before he breaks 26 minutes and I am sure he will.
CONGRATULATIONS WALT!

ENGLISH EZB RECORD

I hear that Bernard Hunt flying an EZB built to U.S. rules set a record of 26:38. I don't have any further details.
CONGRATULATIONS BERNARD!

WHY CHANGE EZB RULES?

Perhaps this is a good place to express my feelings on the proposed EZB rule change requiring a minimum weight of 1.2 grams. The only reason for the change I have heard expressed is that it will give the less experienced builders a better chance to compete. I really don't think that will happen. There are many factors involved beside the weight of a piece of wood and the smart and experienced builders will know best how to optimize them and therefore still be the winners. I believe in simplifying rules and allowing the most possible creativity in design. If we really want to give newcomers a chance to compete, do it by creating a novice class to give recognition to those who have not yet won in that event. This is done successfully in many sports such as rowing and running. Of course next year the rule change will be optional for any given event and lets hope that's as far as it will get.

TAN VS PIRELLI RUBBER

While I'm still on my soapbox, let me talk about restricting the use of Pirelli rubber because it is no longer available to everyone and constitutes an unfair advantage. Measurement of rubber performance is a very inexact thing. There is much data available but so much depends on the exact properties of the test sample and the conditions under which it was taken that it is difficult to quote energy values with much accuracy. No two pieces of pirelli are alike as are no two pieces of FAI TAN. In general, however, the data does seem to indicate that some Pirelli does have a slightly higher energy content than some FAI TAN. It is also true that beside energy content, other properties such as modulus of elasticity are different which require TAN rubber to be sized different from Pirelli. We must learn how to use TAN rubber efficiently. Many records have been set and many contests won with TAN rubber including my 17:01 cat IV ornithopter record at Lakehurst and 1990 & 1991 USIC wins in the ornithopter competition. So lets get with it and forget about restricting the use of Pirelli. Ed Whitten in his recent newsletter published a letter by John Triolo which expressed very eloquently, much the same opinions. You must have concluded by now that I am an old reactionary who resists rules and rule changes. Maybe so.

Review of the 1991 indoor flying season at Cardington - by Laurie Barr

At the end of last year, the situation at Cardington was bleak.

Very few people turned up to fly and the Airship Industry were asking numerous passenger flights at week-ends, which meant the side doors were constantly being opened, usually coinciding with windy weather! and there were numerous large crates and two or more Airships, reducing the available space.

The end of the year indoor technical comittee meeting made vital changes to the admin. team and we were fortunate to have Mike Colling as our Chairman. Laurie Barr re-joined the team which had Butch Hadland, Reg Parham Brian

Kennny and John Kirkpatrick; a formidable array of the best indoor talent!

At about the same time, Airship Industry had to close its operation at Cardington and its lease on the No. 1 hanger reverted back to its owners Holgrove Properties who were , and still are, looking for a new tenant.

Initially the hanger was left in an appauling state inside with the floor covered with "major" trash!, and we were fortunate enough to get Holgrove to agree to give us 12 meeetings on specific dates at an "affordable" rent and they also had the hanger cleared and swept.

Our lease was conditional in the event of a major "let" to a third party, we would have to give way and although this gave great organizational difficulties, it was an excellent opportunity. The well publicized advice to ring before coming is necessary due to the Give Way clause in our agreement. We were lucky that we only gave way on one occasion when a "Pop" group assembled a mobile stage in the hanger and could not work without the doors open and their work overran time.

The publicized desire {Free Flight News) to attract more sport and general flyers was quite successful and this made funding of the hire cost much easier. What it did mean was that no Microfilm flying took place before the August Indoor Nationals and team trials took place, and none of us were well enough rehearsed to be able to put up any substantial flights from the start of the day(s) film flying and this accounts for the low scores and also the hang-ups in the roof.

Our biggest disappointment was the turn out of young flyers for the practice and the Delta Dart events. In fact, only five new young faces were present but at least the flight times were very good. Next year, we will not rely on the commercial model press but try local newspaper ad's.

However, this season has been outstanding in the interest and quality of EZB model flying and the advent of our decision to try the USA model rule for one year proved a good one. To clarify this matter, I should point out that the USA rule model has only a 50% of the wing area stab (maximum allowed), no "funny" props, no microfilm covering and only wood bracing is allowed.

A number of 20 minute flights were made early in the year and when Bernard Hunt and Laurie Barr went to compete in the USA National Champs at the start of June,(*complete results in last issue - ed.*) we made a great impact, and had much better times than the misery of previous misfortunes there!

Laurie won the EZB (22 entries!) with a flight of 22:07 (A new USA record), Bernerd was 4th with 21:22. We also flew EZB for practise, in their intermediate stick class (32 entries) although it was not realistic to win against much larger models. Bernard came 12th, 22:03 and Laurie 11th with 22:16.

In limited pennyplane (68 entries), Bernard came 5th with 13:09 and Laurie 10th with 12:28. Laurie took a USA rules 4 gram Manhattan model which placed 5th without much practise and the same in Catapult Glider with a respectable 12th place out of 21 entries and was twice 3rd in Mini Stick.

We deliberately took no microfilm models, to ease the travel problem, and we hope to return there next year, better prepared, for other non-microfilm events. I can commend this as the indoor modelers mecca for quantity, quality and the excellent flying conditions, with great contest direction. The evening socializing kept the party spirit going!

Editor's note:- *We congratulate our English competitors for their fine performance at the USIC. We enjoyed having them there and look forward to their returning next year.*

The world wide "postal" contest inspired and organized by Mike Colling was very well supported with 60 entries! including large USA and Japanese support (*complete results in last issue - ed.*). Although Laurie Barr made the longest flight our own John O'Donnell won it by flying well under a low ceiling, giving him the best corrected time. This event will take place next year, and in high ceiling sites, times of over 9 minutes (Bernard Hunt) are now taking place!

For next year, as far as we can tell, Cardington will again be available for <u>any</u> indoor modeller who is a BMFA/SMAE member and we hope to see all of you there, especially a lot more Delta Dart model flyers who want to win some of the £100 prize money!!

Nationals and team trial results - Cardington 26 Aug. 1991 and 2nd trial 8 Sept. - F1D

<u>Aeromodeler Trophy & Houlberg Gold</u>
1. Bernard Hunt - 38:59 + 39:08 = 78:07
2. Laurie Barr - 35:23 + 35:29 = 70:52
3. Brian Kenny - 31:11 + 31:55 = 63:06

<u>Houlberg (Silver) Trophy</u> - for EZB
1. Bernard Hunt - 23:38 + 24:03 = 47:41
2. Bob Bailey - 22:32 + 22:41 = 45:13
3) Laurie Barr - 20:22 + 21:38 = 41:58

<u>Sweepette Trophy</u> - for catapult glider
1. Mark Benns - 1:15 + 1:12 = 2:29
2. Mike Page - 1:05 + 1:12 = 2:17
3. Derek Richards - 1:06 + 1:07 = 2:13

It has been a great year (Again!) for Bernard Hunt as he won every contest he entered in the U.K. and flying one of the USA rules EZB, he set a new world record time of 26:38!! at the end of the day during the second trials of Sept. 8th. It might have been a longer flight had not one of the security guards opened the large end door, just as the model was on final decent.

So at the end of the year of good flying in the old "shed", we look forward to next year with equal keenness and opportunity and hope to see more of you take advantage of an outstanding place to fly and we especially want to encourage new people with the promise that indoor modellers are a friendly lot, and are willing to pass on their knowledge to help newcomers achieve serendipity with "true" religion!

<u>1991 JAPAN vs. UNITED STATES F1D POSTAL</u>

The F1D postal contest between Japan and United States was organized by Mr. Shigeyoshi Nonaka of Japan and Mr. Thomas Vallee of the United States as a result of contacts made when Tom was one of the official timers for the Japanese team at the 1990 world championships in Tennessee. The contest rules were simple:
1. 3 man teams

2. Cat I flying sites - no fudge factors - best time wins
3. F1D models flown to FAI rules over 1 or 2 days

The United States team flew at the Goddard Space Flight Center auditorium on June 22, 1991 and the Japanese team flew at the National Olympic Memorial Center on July 15, 1991.

INDIVIDUAL STANDINGS

1. T. Vallee	- USA	27:18 + 27:12	= 54:30
2. H. Enomoto	- Japan	25:48 + 26:52	= 52:40
3. D. Belieff	- USA	22:40 + 23:00	= 45:40
4. P. Kleinert	- USA	21:41 + 22:40	= 44:21
5. H. Odagiri	- Japan	18:34 + 14:47	= 33:21
6. S. Nonaka	- Japan	12:11 + 16:49	= 29:00

TEAM STANDINGS

1. United States	144:31
2. Japan	115:01

The Japanese team was quite strong, consisting of their top two 1990 team members Hideyo Enemoto, Shigeyoshi Nonaka and former team member Hideharu Odigiri. Mr. Enemoto is also a former Category I world record holder.

1992 F1D WORLD CHAMPIONSHIPS

The 1992 F1D - FAI world indoor model championships will be held in Warsaw, Poland on July 6 - 12, 1992.

SCHEDULE
July 6 - arrival
July 7 - check-in, practice, opening of W/CH
July 8 - 10 - competition flights
July 11 - reserve day, sightseeing, closing & banquet
July 12 - departure

CONTEST SITE
The World Championships will be held in a 48 meter high sports hall, situated in the center of Warsaw.

CONTEST RULES
The contest will be run according to the rules of the current FAI Sporting Code, Section 4 - General and Section 4a - Aeromodels - part two.

PARTICIPATION
Every member of the FAI is allowed to enter for the W/CH a team consisting of:
not more than three senior competitors
not more than three junior competitors
one team manager
one assistant team manager
helpers, supporters, etc.
reigning World Champion
one timekeeper
every competitor must possess a Sporting License of the FAI affixed with the FAI stamp for 1991, issued by his National Aero Club.

CLASSIFICATION
Both individual and team classification, separately for seniors and juniors. Winners will be awarded with medals, diplomas and trophies.

LANGUAGE
The official languages are English and Polish.

NOTE: Frank Kieser had a stroke and can no longer operate the INAV/NIMAS newsletter. Write him.

1992 JAPANESE W/C TEAM SELECTION

DREAM ISLAND GYM - (12.5 METER HEIGHT)
SEPTEMBER 23, 1991
WEATHER - FINE, TEMP. - 31C

1. Satoshi Kinoshita	28:38 + 28:16	= 56:54
2. Hideyo Enomoto	28:25 + 25:59	= 54:24
3. Masatoshi Misawa	27:17 + 26:36	= 53:53
4. Kazumasa Kihara	26:48 + 25:01	= 51:49
5. Toshiaki Okada	24:33 + 12:05	= 36:38

NOTICE: Please submit much needed articles, model designs, helpful hints, sketches, photos, contest results, etc., in reproducible form directly to Plenny Bates.

SIMPLE ORNITHOPTER DESIGN

You may recall in the May '91 issue of INAV, I discussed the possibilities of a Simple Ornithopter Design (SOD) as suggested by Tony Italiano. I put some limited effort in a design that started as a monoplane and could later be converted to a biplane. I built one with some success but haven't had time to do much more. Warren Williams also took up the challenge with an interesting approach which is to have two similar designs, one a tractor and the other a canard pusher. They both have similar wing planforms and flapping mechanisms as shown in the accompanying plans and pictures. He also sent me an interesting description from which I have excerpted the following:

I'm happy I took the challenge and built two simple biplane ornithopters. Yes, I now have complied with your SOD rules - 16" wing, solid motor stick & weight over 3 grams. I thought I would kill two birds with one stone by using the same wing and stabilizer outlines. My original tractor and canard were under three grams and I was able to test them during a session at the armory in Los Angeles. I found the tractor flying right off the drawing board with very little adjustment needed. The canard was trouble from the start, very unstable with elevation and directional problems. I found the C.G. too far forward and had to move the elevator to the end of the stick. At the same time, I added a rudder and from then on I had no more trouble. My best time was over three minutes and I attribute this to being under weight and the design of my new efficient wing. Over 50% of the area is thrust producing. A wider chord at the tip than the inboard section works great for me.

I have built several new models from the prototype that weigh over 3.2 grams with smaller stabilizers. I also put the extra weight needed in the structure. I will do more testing at our session next month. Both models have lots of potential and should be competitive as the new trend progresses. They say my design may look complicated but it's real;ly simple to build. Look at it this way. If you build one biplane, in reality, you are building two simple single flappers. It just takes a little more time. I crank out two or three ornithopters a month just for therapy and besides it keeps me occupied and out of trouble.

Note:- The crank shaft bearing is 1/8 round balsa sliced 3/64 inch thick. Drill an .015 hole in the center and install balsa bearing in place on the crank shaft and squeeze a drop

of super glue on the back side. Dust drop with baking soda thus locking in the crank shaft and hardening the balsa bearing. Balsa push rods are drilled at the ends and painted over with thin super glue. This also leaves the wood rock hard. All my double thrust bearings are made from the top of "Planter's" .010 aluminum peanut cans.

SUBSCRIPTIONS

We plan to publish this newsletter four times a year. Subscription rates include membership in the Indoor Model Airpplane Society. The following are the rates for four issues:

$ 8.00	U.S., Canada, Mexico
$ 9.00	overseas surface mail
$11.00	Air mail - Europe & S. Amer.
$12.00	Air mail - Asia, Australia, New Zealand

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

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USA

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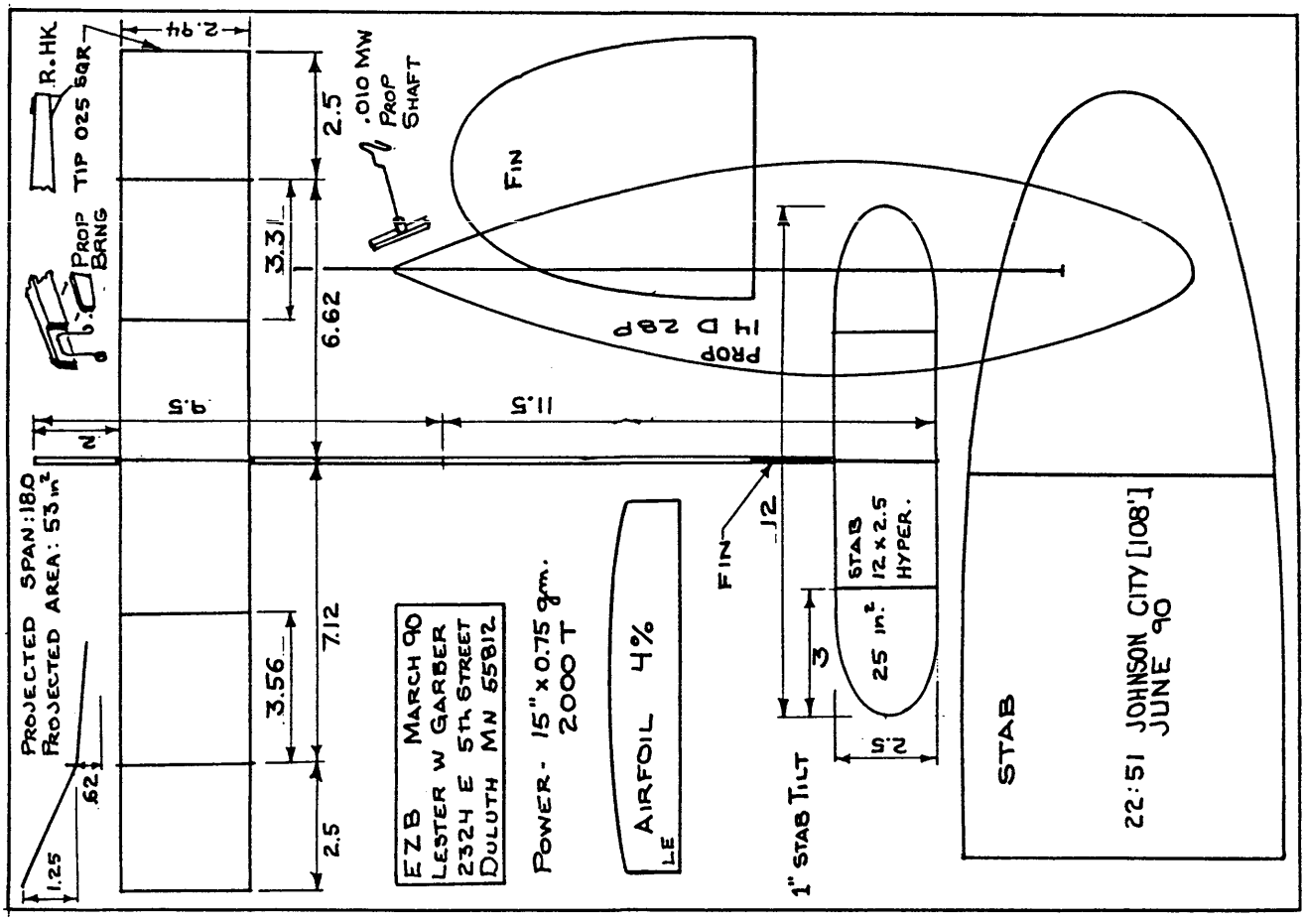
SUBSCRIPTION EXPIRES NEXT ISSUE ---X---

FOR RENEWAL - See rates above
NO X - Indicates at least one more issues

DYEING ULTRAFILM by Fred Rash

Recently I wanted colored indoor covering for improved visibility. Instructions for dyeing tissue and silk have appeared in the model literaturebut I had not seen instructions for polyester film. Two batches of Ultrafil;m polyester (from Ray Harlan) were dyed rather easily. Cut the film from the roll (and later from the edges of the framnework) with a hot wire to reduce the likelihood of rips and tears. For this, I use a crude cautery or hot wire cutter made from .009 to .010 inch diameter nichrome wire about 2 inches long, a Radio Shack battery box and two alkaline or nicad AA cells. Enough film for about 2 planes was crumpled into a small metal can with a 1:3 mix of Rit dye and water. This mix was stirred with a popsicle stick and simmered for 20 minutes over a Sterno stove outside to avoid messy spills. While we all wear dyed clothes, wise modelers minimize to dyes as well as to thinners, balsa dust and rotating power props. Once the dyed film has been rinsed well, the renaining dye is inside the film and can not rub off. My color was pleasing but not too deep. Use the more intense colors. I did not weigh the film to measure any weight gain but the dye experts I consulted said that dyeing polyester film might add 1% weight.



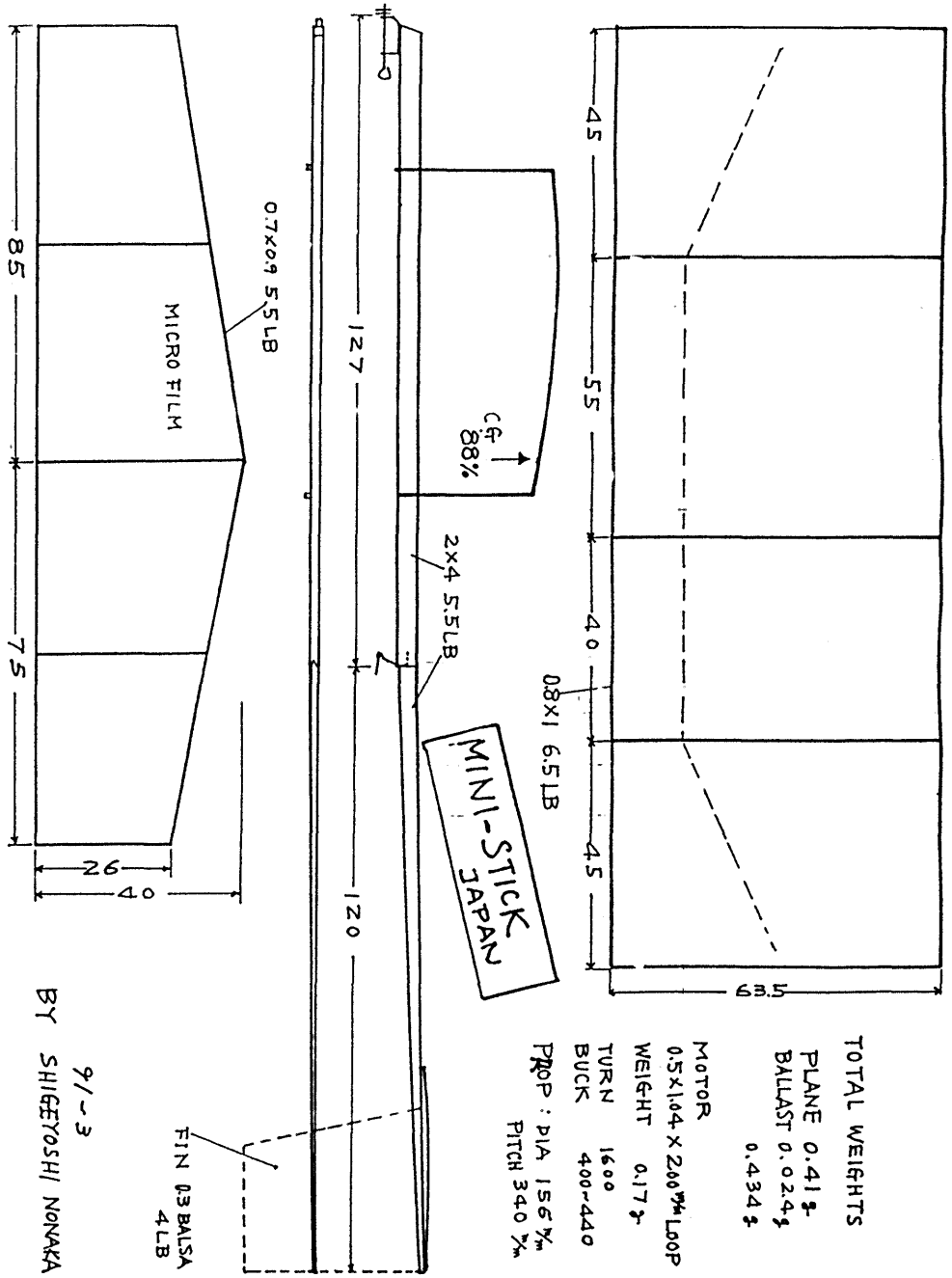
Lester W. Garber - EZB Design - March 1990

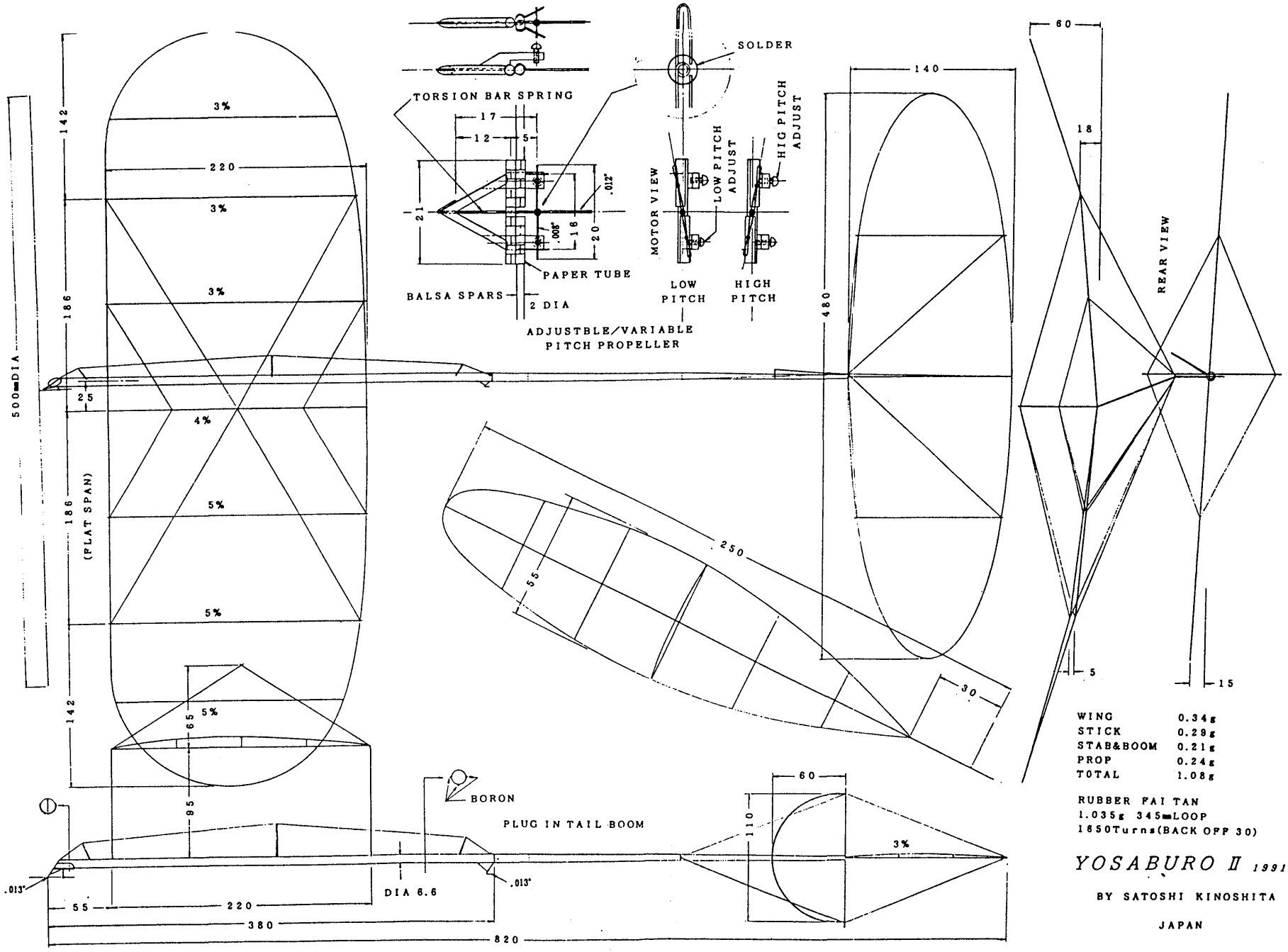
1) EZB WOOD SIZES AND DENSITIES.

Motor Stick:	Size: .160Dx.080W to .240Dx.120W to .160Dx.080W x 9.5L Density: 3.7 lb/ft³. Weight: 0.191 gm.
Tail Boom:	Size: .090Dx.075W to .045Dx.040W x 11.5L Density: 4.2 lb/ft³. Weight: 0.051 gm.
Front Wing Spars:	Size: .070Dx.030W to .035x.022 x 10L Density: 6.5 lb/ft³. Weight: .027 gm @ 10L before cutting to final length.
Rear Wing Spars:	Size: .065Dx.027W to .030x.025 x 10L Density: 4 lb/ft³. Weight: .019 gm @ 10L before cutting to final length. Note: Left rear spar is heavier (.020 gm @ 10L) than is right rear spar (.018 gm).
Wing Ribs:	Size: .030Dx.019W Density: 4 lb/ft³. Weight: 5 ribs weighed .006 gm. Note: Stab ribs .025Dx.019W
Stab Spars:	Size: .040Dx.020W to .020Dx.020W to .040Dx.020W Density: 5.5 lb/ft³.
Fin Frame:	Size: .020 x .020 Density: 5 lb/ft³.
Wing Posts:	Size: .047 Dia x 1 L Density: 5.5 lb/ft³. Weight: 2 posts, .009 gm.
Prop Spar:	Size: .028x.028 to .059Dx.052W to .028x.028 x 12L Density: Center 3 in. section 6 lb/ft³. Outer 4.5 in. sections 4 lb/ft³. Weight: 0.032 gm. Note: Prop spar+.010 prop shaft+Teflon Brng: .049 gm.
Prop Blades:	Size: .005/.006 Quarter grain (Sand to dim. on glass). Density: 4 lb/ft³, (low as possible) Weight: .045 gm finished weight. Note: Grain at 30 deg. to prop shaft. On blades, glue blade sections with .060 lap joints before cooking blade to shape.

2) WEIGHTS OF COMPONENTS.

Flat wing frame:	0.112 gm.			
Covered flat wing frame:	0.192 gm.	(Mylar + Spray = 0.080 gm)		
Covered wing w/ posts & Dih:	0.205 gm.			
Stab frame:	0.030 gm.			
Covered stab:	0.070 gm.	(Mylar + Spray = 0.040 gm)		
Fin frame:	0.003 gm.			
Covered fin:	0.009 gm.	(Mylar + Spray = 0.006 gm)		
Total Mylar + Spray:	0.126 gm.			
Nose Bearing (0.010 MW):	0.006 gm.			
Motor Stick:	0.191 gm.		**Body + Tail:**	**0.352 gm.**
MS + Brng:	0.208 gm.		**Wing + Posts:**	**0.205 gm.**
MS + Brng + R.Hk:	0.214 gm.		**Prop:**	**0.149 gm.**
MS + Brng + R.Hk + T. tubes:	0.217 gm.		**TOTAL WEIGHT:**	**0.706 gm.**
Tail Boom:	0.051 gm.			





WING	0.34g
STICK	0.29g
STAB&BOOM	0.21g
PROP	0.24g
TOTAL	1.08g

RUBBER PAI TAN
1.035g 345mmLOOP
1650Turns(BACK OFF 30)

YOSABURO II 1991

BY SATOSHI KINOSHITA

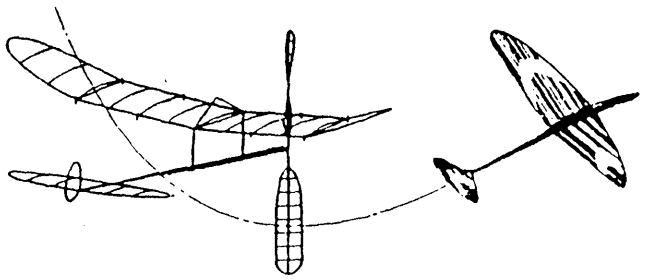
JAPAN

The Voice of N.I.M.A.S.

INDOOR

NEWS and VIEWS

MAY - 1991 #49,50



Editor: Frank Kieser - 2595 Whippoorwill Lane, Vero Beach, FL 32960 (407) 569-7812

AMA NATIONALS
combined with
TENTH UNITED STATES INDOOR CHAMPIONSHIPS

June 6, 7, 8, 9, 1991

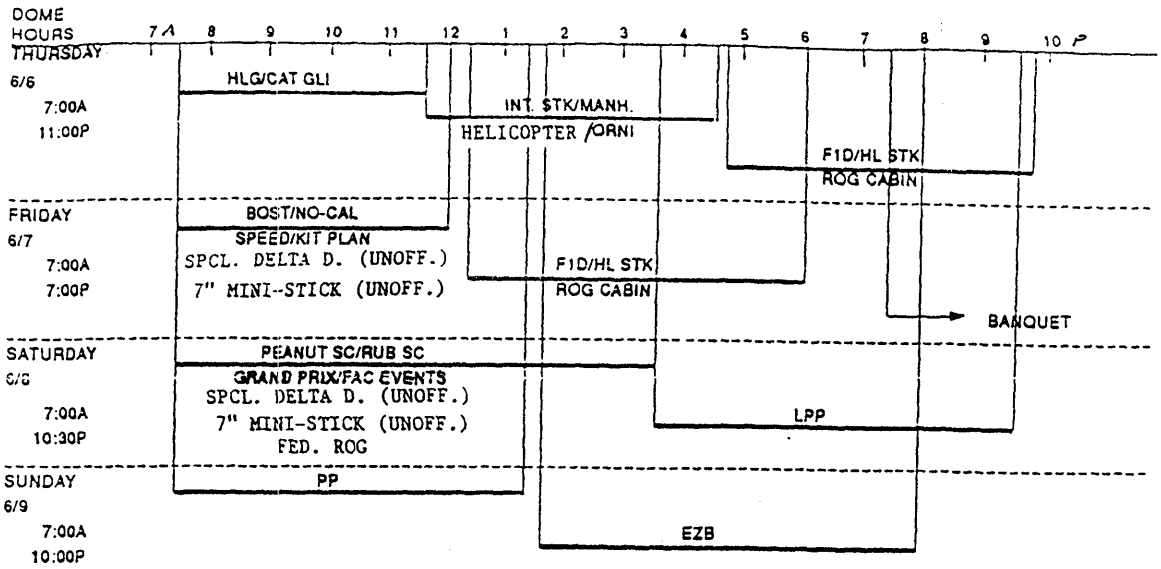
"Mini-Dome"—East Tennessee State University
Johnson City, TN

Sponsored by
National Free Flight Society/
Academy of Model Aeronautics

NFFS

AMA SINCE 1936

REVISED SCHEDULE



The tenth annual United States Indoor Championship will be held for the sixth successive year in the Mini-dome and for the second year, it will also be the AMA National Indoor Championships. As everyone knows who has been there previously, it is a marvelous site. The ceiling is 116 feet at the center of the arch and the floor is 206 feet by 420 feet. In previous years, the air has been very calm with little drift and models that have gone to the ceiling have landed in almost the spot from which they were launched.

So we are looking forward to another great contest this year and anyone that makes it will not be disappointed. There will be a total of 26 events of which 14 are National Championships. There certainly should be an event for every indoor modeler from beginner to expert. Please see the revised schedule above and lets make it the biggest turnout yet.

WHAT'S NEW

As you can see from the masthead, there has been a change in editors since the last issue. Melody and Richard Doig have asked Tony Italiano to find a new editor since their numerous personal and business committments have prevented them from devoting sufficient time to this publication. At Tony's request, I have agreed to be the new editor, although I have not had much experience at this kind of thing. We all thank Richard and Melody for the fine job they did and I hope I can keep up the high standards they set.

I thought I might give you a few words of introduction about myself. I am one of the many model builders that enjoyed the hobby in my youthful days but had little time to devote to it during the hectic days of raising a family and earning a living as a research and design engineer. As retirement approached a some years ago, I renewed my interest in the hobby and although I had not done so previously, I began competing in the indoor meets in the Cleveland area. I never felt skilled enough for the delicate work of microfilm covered models so I stuck to things like Easy B, Bostonian and the first circular speed contest at West Baden. Then one day, in an airport gift shop, I came across a plastic rubber powered bird and that was my introduction to the ornithopter.

From there, I progressed to Lew Gitlow's ornithopter kit but I had little success with it. It was about that time that Pat Deshaye broke the ornithopter record with his biplane ornithopter. I immediately grasped upon this concept as the solution to the vibration problems I was having with the monoplane design. I added my own innovation of a canard design and had a model ready for the USIC that year in Detroit. Although it was pretty crude and heavy, I placed a close third behind Walter Erbach and Roy White and I knew I was on the right track.

At about that time we decided to move to Jacksonville Beach FL where I had a couple sons living. Fortunately, I got access to the comunity center building called the Flag Pavilion to do a lot of test flying and gradually I refined the design and improved my construction techniques. I also was able to compete with "Doc" Martin's MIAMA club in some of the fine indoor sites he provided. It soon became obvious that I did have the right design and although there were others that were far better craftsmen than I was, I began winning meets and setting records. Because of my success I devoted more and more time to the ornithopter and less to other types.

So as you can see, I am not the well rounded indoor contestant but I hope I can cater to all your interests. I will be anxious for comments, criticism and suggestions. I will also be looking for technical articles, pictures and anything of interest for our readers.

For those who would be interested in subscribing to the Hangar Pilot send $12.50 to:
Dr. John Martin Jr. - Editor
2180 Tigertail Ave.
Miami FL 33133 USA

MIAMA

The glue that holds the indoor modeling world together is the model airplane club starting with the AMA and NFFS and spreading down to the many local clubs throught the country. They bring together modelers with common interests, provide information exchange, teach newcomers the hobby and sponsor contests and provide flying sites.

One of the best clubs is the MIAMA (Miami Indoor Aircraft Model Association) Club which was started over 20 years ago by Dr. John Martin of Miami, Florida. Their motto is "Indoor Isn't For Everyone". Besides his untiring leadership of the club, "Doc" edits regularly the newsletter "The Hangar Pilot" which is a very unique newsletter featuring aviation and modeling art work (a sample of which is included herein) as well as contest news, plans, technical articles and trivia of general interest. It is certainly worth the subscription price.

Although "Doc" is noted worldwide for his work in Peanut Scale, MIAMA is a club of well rounded indoor interests from intermediate stick to Easy B and Pennyplane to Bostonian to all types of scale contests and even Ornithopter. There are monthly meets in all but the summer months. One of the most notable meets is the Indoor King Orange which is usually held at the Delta Maintenance Hangar at the Tampa Airport over the Christmas to New Years holiday. There is always a good turnout from the club and visitors from the North including Walt Van Gorder, Ron Ganser, Gary Underwood, Dave Aronstein, Roy White, Gerry Nolin and many others. If you get the chance, it is a wonderful meet to attend. Other contest sites are the Mc Dill Air Force hangars, the Clearwater Coast Guard hangar and Miami Dade College.

Some of the best indoor model builders are MIAMA members. In addition to "Doc" some of the scale modelers are Millard Wells who is also one of the fine cover artists, George Nunez, Wayne Trivin, Dave Linstrum, Mike Arak, Walt Everson and Rich Mac Entee. MIAMA is also graced by one of the few expert lady builders, Nancy Beitz whose scale models are superb. Dick Obarski has long been a top contender in intermediate stick, Easy B, Pennyplane and Bostonian. Bill Criss and Walt Everson compete in Embryo Endurance and Scale and Frank Kieser has been just about the sole ornithopter competitor. Another unique builder is Charlie Slater who designs and builds scale helicopters, with a driven rear rotor, that fly very realistically.

Finally we must pay tribute to "Doc's" contest organization. Bill Criss, a retired Air Force officer, has been responsible for getting the Mc Dill hangar. There are also the large job of Contest Directors among them being Dick and Elsie Obarski, Rich Mac Entee, Dave Linstrum and "Doc" himself. Dick also secures the Delta hangar for the King Orange meet.

In closing, no one in the MIAMA Club will ever forget Tony Becker who it seems like only yesterday left us for that better place in the sky. Tony was one of the finest model builders I have known and held many records in Pennyplane and other events. He was also a great and always helpful person. We will always miss him.

SIMPLE ORNITHOPTER DESIGN

Tony Italiano has proposed a new class of ornithopter for the beginner as outlined in his letter below followed by my response to him. I would be happy to hear from anyone with ideas for this design.

Dear Frank April 14,1991

It seems to me that we need to revive the ornithopter event or at least kick it up to a higher level of participation.

The designs and technology are too complex for the average modeler. Why not create a new ornithopter event around the "KISS" principal? Create a set of rules that will result in simple designs that rank amateurs can build. Possibly limit size, weight (if needed), single set of flapping wings, tractor or canard, etc. It would also be extremely helpful if a very detailed set of instructions could be written and offered. Also, the hinge/pin design could be molded as a package and then maybe we could get Lee Campbell to produce the whole thing. A couple of simple designs could be presented in the various press vehicles.

Think about it. Maybe you could put that as a challenge in the newsletter.

Have fun, Tony

Dear Tony, April 19, 1991

I read your recent letter with interest and I agree with most of what you said. We do need a simple ornithopter design to encourage more indoor builders to give it a try. The ornithopter isn't that difficult a design, it just impresses people that way. The SOD (Simple Ornithopter Design) might have the following rules:

1. No high tech materials such as boron.
2. Minimum weight - say 3.1 gm. - like Pennyplane
3. Maximum span - say 16 inches
4. Mylar covering - OK
5. Stab area - 50 % flapping area max.
6. Solid motor stick

The design should not be restricted to a monoplane. A biplane is no more complex to build, just a few more parts and the advantages of the smoother propulsion is certainly worth it. I, for one, probably never would have continued with ornithopters if I hadn't tried a biplane design.

I am presently working on a design that looks promising. The key is in utilizing a simple tissue hinge for the wing hinges in combination with a simplified assembly proceedure. I hope to have one to demonstrate at the USIC. By copy of this letter, I am also requesting other ornithopter designers such as Roy White, Joe Krush, Les Garber and Warren Williams to consider the problem. Hopefully we can all get together at Johnsom City in June.

Sincerely, Frank

cc: Les Garber, Ken Johnson, Joe Krush, Bob Meuser, Herb Robbins, Roy White, Warren Williams

EASY B

There is to be a provisional FAI rule for Easy B which will be the same as the AMA rule except that the weight will a minimum of 1.2 gms. and it will be the best 2 of 6 flights. The Contest Board will be receiving a request for interpretation with the following choices:

1. Do not fly FAI rules in AMA competition
2. Fly both in competition
3. Have a provisional ruling to replace the AMA rule with the FAI rule

If either of the last 2 is selected, an additional decision will be made to:

1. Begin immediately
2. Start on Jan. 1, 1992

Contact your Contest Board representative to give him your opinions on this matter.

ACTIVITIES

For this first issue of mine, I am omitting this section but in future issues, I hope to have a good run-down on planned indoor competition and other activities. Please help to make this complete and informative by sending me a list of those activities you wish to have published. For the time being, see Bud Tenney's collumn in Model Aviation.

SUBSCRIPTIONS

We plan to publish this newsletter four to six times a year. Subscription rates include membership in the Indoor Model Airplane Society. The following are the rates for six issues:

$ 8.00	U.S., Canada, Mexico
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$11.00	Air mail - Europe & S. Amer.
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SUBSCRIPTION STATUS

SUBSCRIPTION EXPIRES THIS ISSUE -----

SUBSCRIPTION EXPIRES NEXT ISSUE -----

FOR RENEWAL - See rates above
NO X - Indicates at least two more issues

Bob Randolph getting ready to launch his record-breaking "Top Cat 90L" F1D. FROM F.F. DIGEST

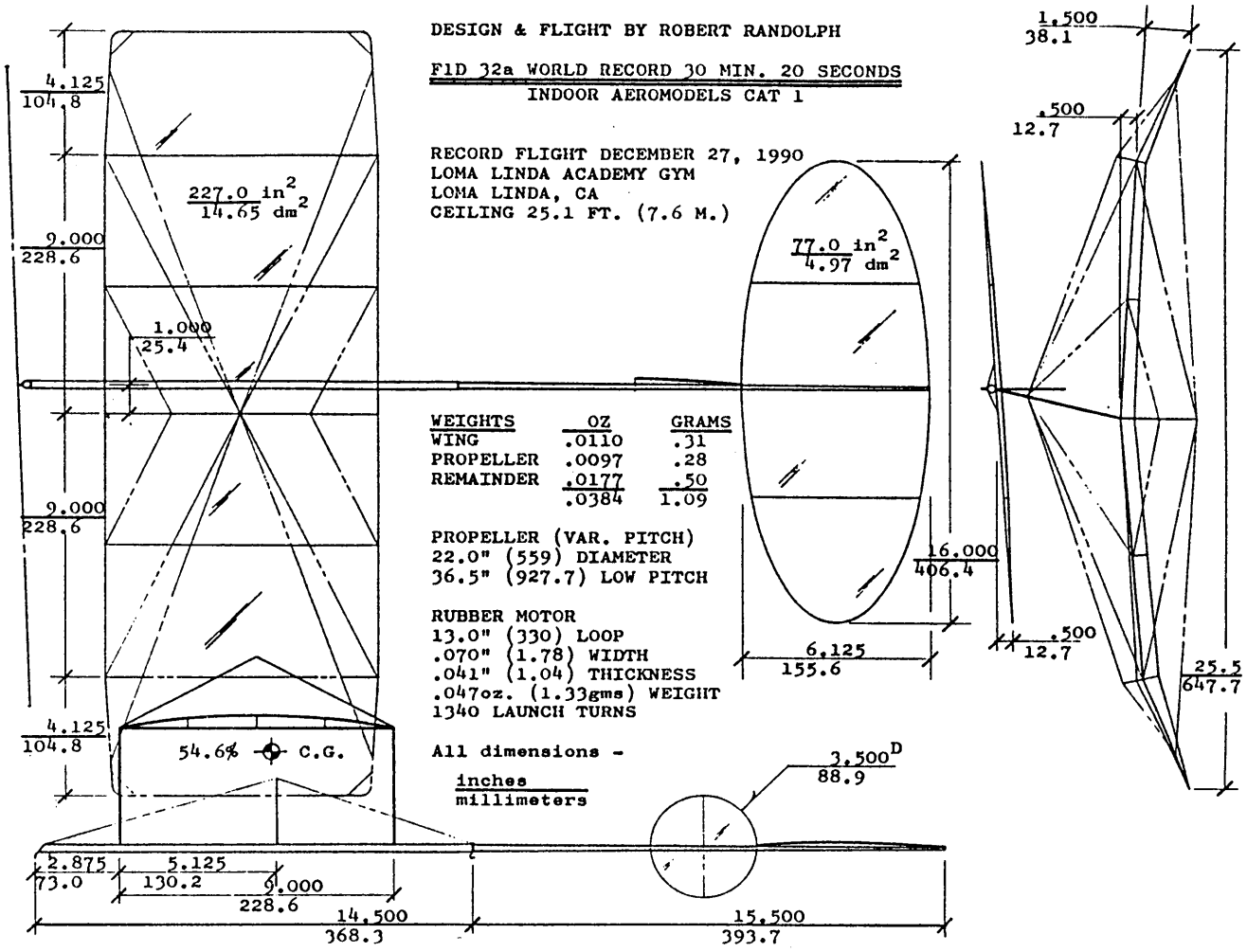
How To Cure Her Headache? Remove Bullet

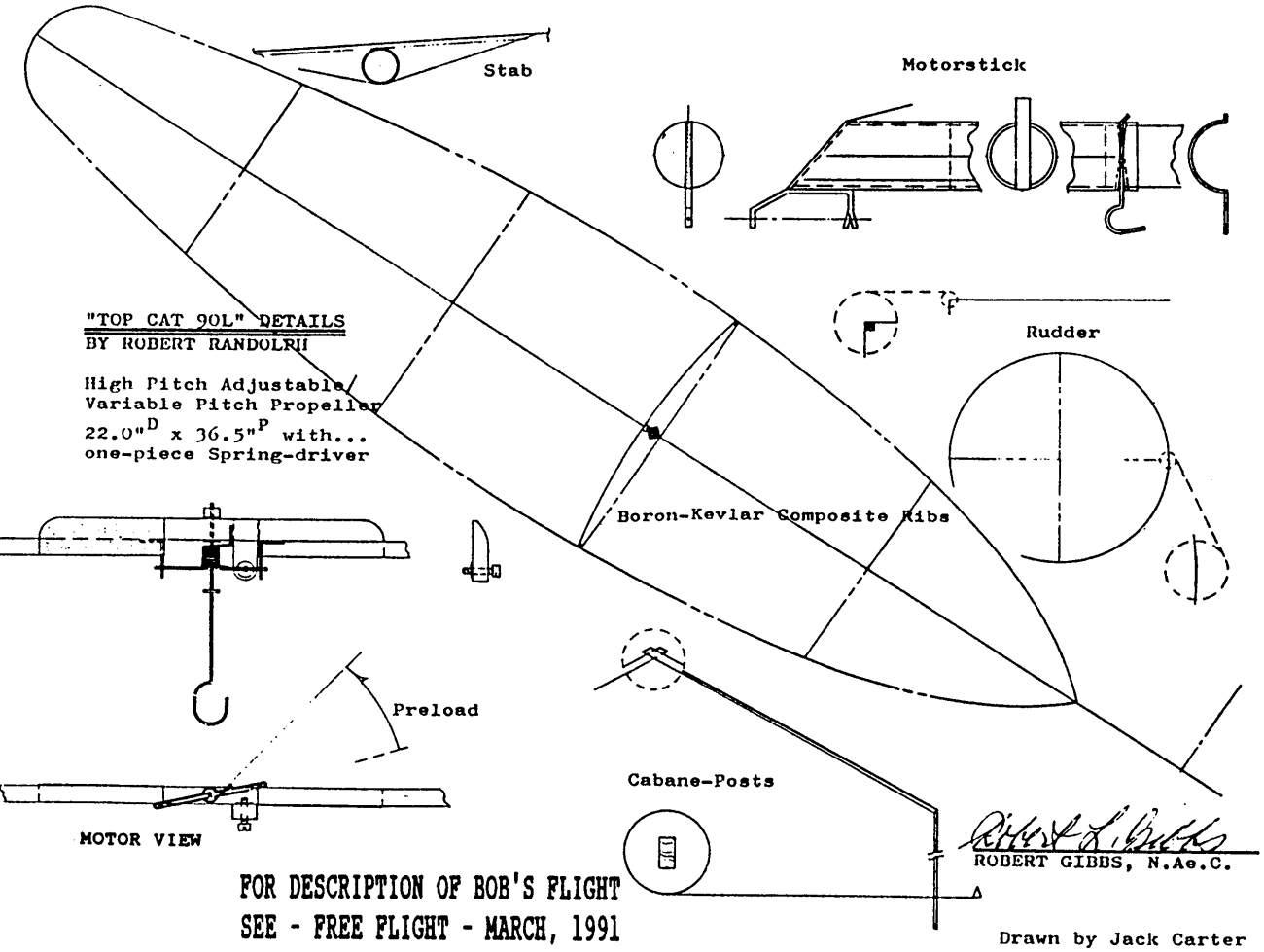
FERNANDINA BEACH (AP) — An emergency room patient with a bullet in her head denied she had been shot and accepted only pills and staples as treatment.

Three days later, after Josephine Zangla's eyes began bulging out, she went to a second hospital and was admitted. Her husband then was jailed on a charge of attempted murder.

Mrs. Zangla, 40, was in stable condition Friday at Methodist Medical Center in Jacksonville, a hospital spokeswoman said.

On May 3, when Mrs. Zangla showed up at the emergency room of Nassau General Hospital, she said she had been hit with a gun butt during an argument with her husband. Hospital officials said she refused extensive treatment, possibly because she was trying to protect her husband.





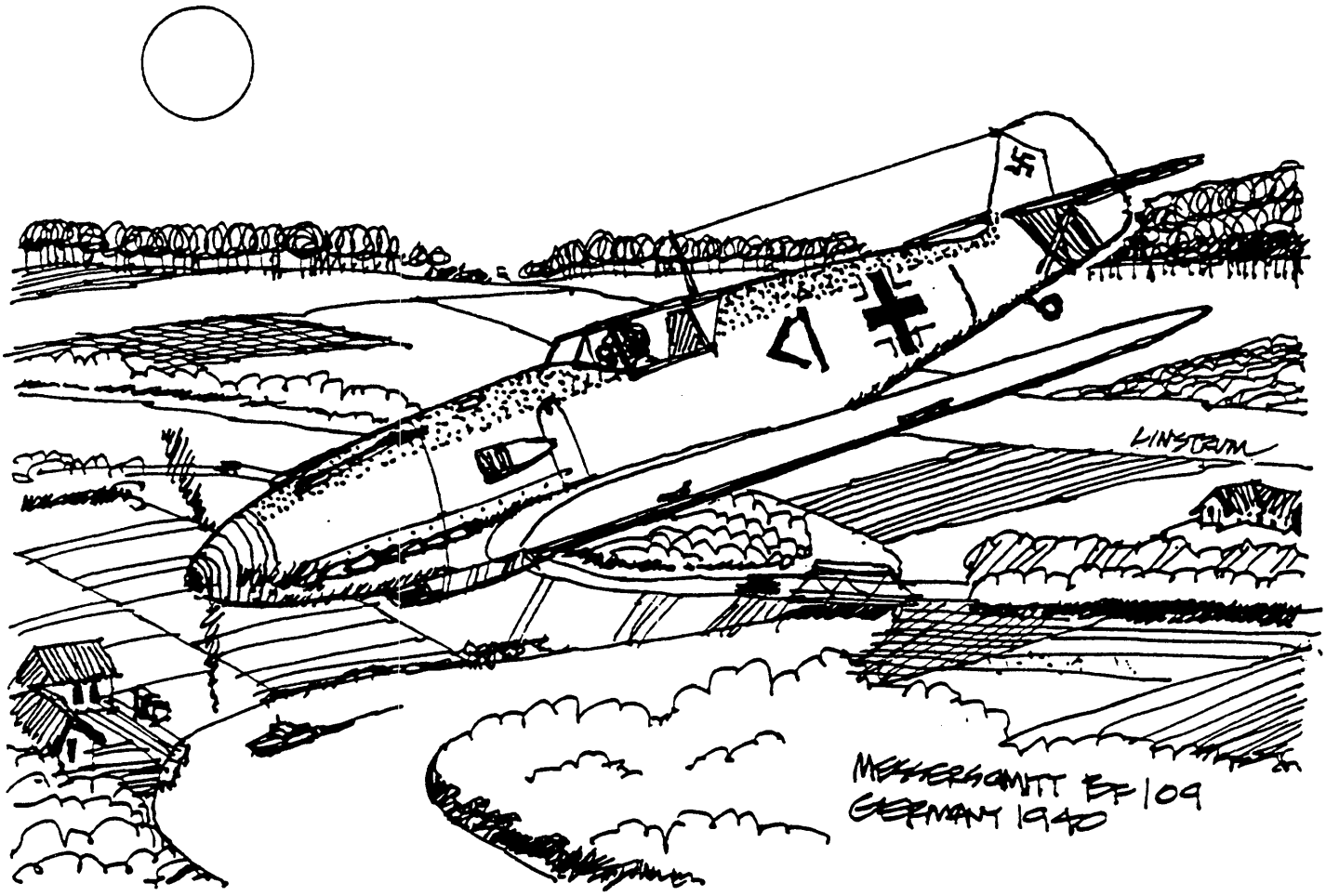
"TOP CAT 90L" DETAILS
BY ROBERT RANDOLPH

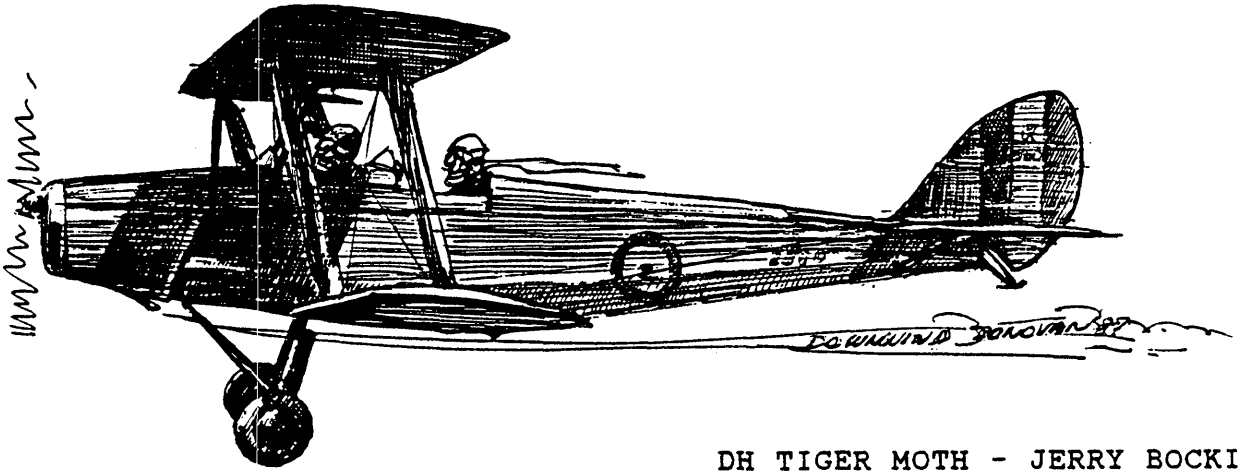
High Pitch Adjustable/
Variable Pitch Propeller
22.0"D x 36.5"P with...
one-piece Spring-driver

ROBERT GIBBS, N.Ae.C.

FOR DESCRIPTION OF BOB'S FLIGHT
SEE - FREE FLIGHT - MARCH, 1991

Drawn by Jack Carter





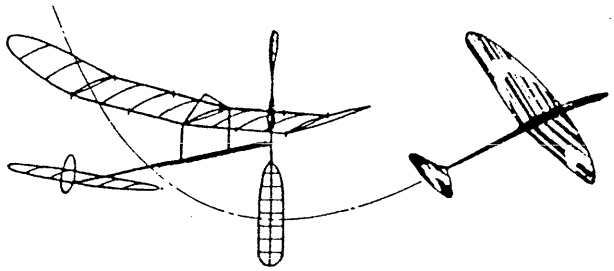
DH TIGER MOTH - JERRY BOCKIUS

COVER ART
FROM

THE HANGAR PILOT

The Voice of N.I.M.A.S.

INDOOR NEWS and VIEWS



AUGUST - 1991 #51,52

Editor: Frank Kieser - 2595 Whippoorwill Lane, Vero Beach, FL 32960 (407) 569-7812

1991 AMA NATIONAL INDOOR CHAMPIONSHIPS
UNITED STATES INDOOR CHAMPIONSHIPS
by A. J. Italiano

ANOTHER BIGGIE !!

The combined 1991 AMA Indoor Nationals and the Tenth U.S. Indoor Championships has been a resounding success (as perceived by the highly biased CD). The weather was "perfect" in the East Tennessee State University Dome. We enjoyed a count of 120 modelers making over 1,400 official flights. Having the competition spread over 4 days allowed ample time to adjust and competitively fly the darling creations.

This year we had a new event, the MINI-STICK, with both a duration event sponsored by IMARC and a mass launch sponsored by MIAMA. The times for these small models was amazing and it is one of the first times they were flown under such a high ceiling. There were a number of new names on the scene which is a good sign but conversely a number of old familiar names did not appear. Possibily as time progresses, we should think about having such a large competition on an every other year basis. Consider that with the availability of the Lakehurst hangar, we may not be able to support all of the indoor activities by the same modelers.

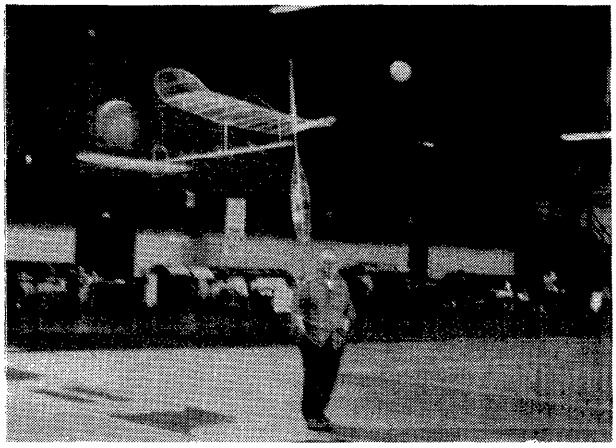
Maybe at a future year, we should run a Johnson City city-wide Delta Dart program. Any volunteers?

The main disappointment was that we only enjoyed the entry of 2 juniors and 2 seniors. On the other hand, we had Messrs. Laurie Barr and Bernard Hunt from England as well as 7 Canadian competitors to compete with the USA crowd. We enjoyed this attempt at infiltrating our activity and they performed exceedingly well. In fact, Jack McGillivray from Canada was the USIC Grand Champion.

During the banquet at the Sheraton Inn, Richard Obarski was inducted into the NFFS Free Flight Hall of Fame.

The downside of the whole proceedings was the announcement that Tony Italiano will be retiring from the active execution of the NFFS USIC. A very great urgency now exists for some aggressive soul or souls to step forward and assume the reigns. A team of 2 or 3 movers could do the job with ease and all it takes is for each of you to assess your priorities --- do you want to have a USIC or have the hobby die an unnatural death?

Step up and be counted, indoor activity needs you.



Joe Krush - Indoor Stick

Laurie Barr & Tom Green - Manhattan Cabin

"Doc" Martin - Mini - Stick

Photos by Frank Kieser

1991 ACADEMY OF MODEL AERONAUTICS NATIONAL CHAMPIONSHIPS
UNITED STATES INDOOR CHAMPIONSHIPS
CONTEST DIRECTOR:---A. J. Italiano

HAND LAUNCHED GLIDER----------CD: Doug Barber

PLACE/CONTESTANT	BEST FLIGHT	SECOND BEST	TOTAL BEST 2
JUNIOR			
1 Chris Sydor	42.0	41.0	83.0
2 Kris Forward	15.4	15.2	30.6
OPEN			
1 Bernie Boehm	67.5	67.5	135.0
2 Bruce Kimball	65.1	63.3	128.4
3 Randy Kleinert	58.6	58.3	116.9
4 Don Slusarczyk	57.7	54.5	112.2
5 Jerry Plassman	55.3	54.1	109.4
6 Wayne Trivin	55.3	51.7	107.0
7 Moe Whittemore	52.3	52.1	104.4
8 Vito Gagliano	51.2	50.8	102.0

PLACE/CONTESTANT	BEST TIME	SECOND BEST	TOTAL BEST 2
SENIOR			
1 Jim Buxton	67.5	67.0	134.5
2 Don Deloach	45.3	42.3	87.6
OPEN			
9 Chuck Slusarczyk	49.5	49.2	98.7
10 Mark Vancil	51.9	44.4	96.3
11 Dan Belieff	44.1	43.8	87.9
12 Mathew Gagliano	47.0	40.7	87.7
13 Bill Schlarb	43.0	42.4	85.4
14 Phillip Hartman	41.8	41.1	82.9
15 Abram Van Dover	19.0	18.0	37.0
16 Tobias Feuer	16.9	16.0	32.9

CATAPULT GLIDER------COMBINED AGES------CD: Doug Barber

1 Chuck Markos	80.0	78.4	158.4	15 Bob Champine	60.9	57.2	118.1
2 Wayne Trivin	78.4	75.6	154.0	16 Dan Marek	59.8	57.5	117.3
3 Ralph Schlarb	77.1	74.6	151.7	17 Fred Rash	57.8	56.3	114.1
4 Bill Schlarb	76.0	74.5	150.5	18 Gordon Wisniewski	57.0	56.9	113.9
5 Vito Garofalo	75.3	75.0	150.3	19 Jerry Plassman	57.0	56.2	113.2
6 Phil Klintworth	74.0	73.2	147.2	20 John Triolo	55.3	54.6	109.9
7 Bruce Kimball	73.4	73.3	146.7	21 Jess Shepherd Jr.	51.2	49.8	101.0
8 Don Deloach (SR)	71.3	67.1	138.4	22 Emanuel Radoff	49.1	48.4	97.5
9 Jerry Nolin	67.6	67.2	134.8	23 Stuart Weckerly	49.1	42.2	91.3
10 Ed Konefes	65.1	63.9	129.0	24 Anthony D'Alessandro	46.2	41.7	87.9
11 Ed Deloach	63.4	63.1	126.5	25 John Voorhees	45.3	40.3	85.6
12 Laurie Barr	62.0	59.8	121.8	26 Walter Eggert	44.7	37.6	82.3
13 Richard Doig	60.6	59.8	120.4	27 Tobias Feuer	34.0	31.3	65.3
14 Dan Belieff	60.7	57.7	118.4	28 Moe Whittemore	27.2	10.0	37.2

FAI INDOOR (F1D)----COMBINED AGES----CD: Charlie Sotich

1 Larry Cailliau	40:48	38:31	01:19:19	8 Chuck Slusarczyk	31:11	30:32	01:01:43
2 Jack McGillivray	35:43	34:34	01:10:17	9 Jess Shepherd Jr.	32.02	26:39	00:58:41
3 Don Slusarczyk	34:45	33:42	01:08:27	10 Tom Iacobellis	30:12	23:32	00:53:44
4 Bill Hulbert	34:15	34:07	01:08:22	11 Randy Kleinert	27:01	24:45	00:51:46
5 Stan Chilton	33:19	32:09	01:05:28	12 Gilbert Graunke	26:16	25:10	00:51:26
6 Richard Doig	32:51	30:29	01:03:20	13 Edward Burke	15:05	14:49	00:29:54
7 Dan Belieff	32:52	28:56	01:01:48	14 John Chizmadia	14:00	00.00	00:14:00

INTERMEDIATE STICK----------CD: Del Ogren

PLACE/CONTESTANT	BEST FLIGHT
JUNIOR/SENIOR	
1 Don Deloach	17:34
2 Jim Buxton	16:49
OPEN	
1 Dan Belieff	28:23
2 Dick Obarski	28:05
3 Stan Chilton	27:45
4 John Triolo	26:54
5 Jack McGillivray	26:26
6 Larry Loucka	26:26
7 Don Slusarczyk	25:43
8 Chuck Slusarczyk	25:02

PLACE/CONTESTANT	BEST FLIGHT
OPEN	
9 Ron Ganser	24:47
10 James Grant	24:14
11 John Marett	22:56
12 Laurie Barr	22:16
13 Bernard Hunt	22:03
14 Douglas Barber	21:48
15 Lew Gitlow	21:16
16 Tom Iacobellis	20:24
17 Chuck Markos	20:09
18 Walter Eggert	19:39
19 Tom Vallee	19:37
20 Wally Simmers	19:11

PLACE/CONTESTANT	BEST FLIGHT
OPEN	
21 Gordon Wisniewski	18:52
22 Joseph Krush	18:31
23 Dan Marek	18:07
24 Walter Van Gorder	17:52
25 Tony Sutter	16:37
26 W. Hewitt Phillips	16:01
27 Jess Shepherd Jr.	14:43
28 John Voorhees	14:05
29 Phillip Hartman	11:50
30 Randy Kleinert	10:38
31 David Raymond-Jones	05:15
32 John Chizmadia	01:04

HAND LAUNCHED STICK----------CD: Charlie Sotich

JUNIOR/SENIOR		OPEN		OPEN	
1 Don Deloach	17:07	4 Stan Chilton	33:08	10 Tom Vallee	19:34
		5 James Grant	31:54	11 Dan Belieff	16:44
OPEN		6 Jess Shepherd Jr.	28:54	12 Edward Burke	13:03
1 Don Slusarczyk	38:36	7 Larry Loucka	22:21	13 Chuck Slusarczyk	07:27
2 Larry Cailliau	37:54	8 Joseph Krush	20:21		
3 Richard Doig	37:24	9 Wally Simmers	20:09		

1991 ACADEMY OF MODEL AERONAUTICS NATIONAL CHAMPIONSHIPS (cont.)
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LIMITED PENNYPLANE----------CD: Walter Erbach

PLACE/CONTESTANT JUNIOR/SENIOR	BEST FLIGHT	PLACE/CONTESTANT OPEN	BEST FLIGHT	PLACE/CONTESTANT OPEN	BEST FLIGHT
JUNIOR		OPEN			
1 Kris Forward	09:36	19 William Clarke	11:57	44 Del Ogren	09:57
2 Chris Sydor	05:35	20 Larry Loucka	11:47	45 Burr Stanton	09:55
		21 Dan O'Grady	11:45	46 John Barker	09:48
SENIOR		22 Emanual Radoff	11:40	47 James Grant	09:44
1 Don Deloach	12:35	23 Wally Simmers	11:37	48 Jerry Plassman	09:41
2 Jim Buxton	11:04	24 Tom Vallee	11:34	49 Louis Leifer	09:40
		25 Ed Konefes	11:32	50 Peter Brocks	09:37
OPEN		26 Chuck Slusarczyk	11:23	51 Chester Wrzos	09:27
1 Jerry Nolin	13:42	27 Dan Marek	11:18	52 Abran Van Dover	09:22
2 Walter Van Gorder	13:22	28 Fred Rash	11:16	53 Jack McGillivray	09:19
3 Tom Green	13:17	29 John Ganser	11:11	54 Stan Fink	09:05
4 Wayne Trivin	13:11	30 John Voorhees	11:09	55 James Zufelt	08:56
5 Bernard Hunt	13:09	31 Lew Gitlow	11:08	56 Moe Whittemore	08:49
6 Jim Clem	12:53	32 Larry Mizk	11:00	57 John Fellin	08:48
7 Richard Miller	12:47	33 Walter Eggert	10:55	58 Jim Jones	08:45
8 Bruce Kimball	12:44	34 Paul Avery	10:48	59 W. Hewitt Phillips	08:42
9 Bob Champine	12:39	35 Don Slusarczyk	10:44	60 Harry Geyer	08:34
10 Laurie Barr	12:28	36 Anthony D'Alessandro	10:42	61 Mark Vancil	08:18
11 Gordon Wisniewski	12:25	37 Dan Belieff	10:41	62 Billie Landrum	08:17
12 Tom Iacobellis	12:16	38 Chuck Markos	10:36	63 John Blair	08:02
13 John Marett	12:13	39 Douglas Barry	10:08	64 Richard Doig	07:31
14 Douglas Barber	12:08	40 Lester Garber	10:06	65 Stuart Weckerly	06:36
15 Ron Ganser	12:07	41 Joseph Krush	10:00	66 Tobias Feuer	04:06
16 Phillip Hartman	12:07	42 Dick Obarski	09:59	67 Lou Black	03:42
17 Tony Sutter	11:57	43 David Raymond-Jones	09:57	68 Bill Bigge	03:30
18 Randy Kleinert	11:57				

PENNYPLANE----------CD: Phil Klintworth

JUNIOR/SENIOR		OPEN		OPEN	
1 Jim Buxton (SR)	11:27	9 John Voorhees	13:43	23 David Raymond-Jones	11:01
2 Don Deloach (SR)	11:14	10 Emanuel Radoff	13:39	24 Tony Sutter	10:39
3 Kris Forward (JR)	09:00	11 Bernard Hunt	13:14	25 Joseph Krush	10:33
4 Chris Sydor (JR)	05:17	12 Phillip Hartman	12:43	26 Bob Champine	10:38
		13 Tom Green	12:34	27 Bruce Kimball	10:13
OPEN		14 John Marett	12:33	28 Abram Van Dover	10:09
1 Lester Garber	15:31	15 Jerry Nolin	12:20	29 Peter Brocks	10:08
2 Gordon Wisniewski	15:11	16 Ron Ganser	12:15	30 Wally Simmers	09:57
3 Douglas Barber	14:51	17 Ed Konefes	11:43	31 Larry Mzik	09:43
4 Larry Louka	14:47	18 Jack McGillivray	11:39	32 John Fellin	09:40
5 Don Slusarczyk	14:26	19 Fred Rash	11:38	33 James Zufelt	08:02
6 Tom Vallee	14:26	20 Walter Eggert	11:37	34 Billie Landrum	06:29
7 Chuck Slusarczyk	14:20	21 Randy Kleinert	11:19	35 Mark Vancil	04:42
8 Tom Iacobellis	13:54	22 Jim Clem	11:15	36 Jess Shepherd Jr.	03:30

MANHATTAN CABIN------COMBINED AGES------CD: Abram Van Dover

1 John Marett	11:51	6 Joseph Krush	10:40	11 Moe Whittemore	07:35
2 Walter Van Gorder	11:50	7 Chuck Markos	10:29	12 Stuart Wackerly	07:24
3 James Grant	11:43	8 Ron Ganser	10:26	13 Paul Avery	06:00
4 Anthony D'Alessand	11:29	9 John Triolo	09:02		
5 Laurie Barr	11:12	10 Randy Kleinert	07:51		

NO-CAL----------COMBINED AGES----------CD: Jerry Nolin

1 Chuck Slusarczyk	06:15	9 Daniel Baird	03:44	17 Douglas Barry	01:48
2 David Aronstein	05:26	10 Richard Stonecipher	03:25	18 Abram Van Dover	01:41
3 Lester Garber	05:01	11 Moe Whittemore	03:22	19 Randy Kleinert	02:01
4 John Marett	04:47	12 Dick Obarski	03:17	20 William Clarke	01:35
5 John Voorhees	04:27	13 Ed Konefes	02:53	21 Vito Gagliano	00:41
6 John Ganser	04:01	14 Stuart Weckerly	02:43	22 Burr Stanton	00:03
7 David Aronstein	03:55	15 Walter Eggert	02:26		
8 Jim Buxton (SR)	03:52	16 Bob Champine	02:07		

1991 ACADEMY OF MODEL AERONAUTICS NATIONAL CHAMPIONSHIPS (cont.)
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CONTEST DIRECTOR:---A. J. Italiano

EZB----------CD: Cliff Culpepper

PLACE/CONTESTANT	BEST FLIGHT
JUNIOR/SENIOR	
1 Don Deloach (SR)	19:18
2 Jim Buxton (SR)	07:03
3 Chris Sydor (JR)	06:47
OPEN	
1 Laurie Barr	22:07
2 Don Slusarczyk	22:02
3 Lester Garber	22:02
4 Bernard Hunt	21:22
5 Stan Chilton	21:22
6 Chuck Slusarczyk	21:15
7 Jerry Nolin	21:11
8 Chuck Markos	20:59
9 Jack McGillivray	20:51
10 Dan Belieff	20:47
11 Walter Van Gorder	20:45
12 John Marett	20:18
13 Bruce Kimball	20:11
14 Andrew Tagliafico	19:45
15 Lew Gitlow	19:15

PLACE/CONTESTANT	BEST FLIGHT
OPEN	
16 Dick Obarski	18:56
17 Gordon Wisniewski	18:37
18 Randy Kleinert	18:17
19 Louis Leifer	17:49
20 James Grant	17:46
21 Richard Miller	17:46
22 Stuart Weckerly	17:36
23 Wally Simmers	17:36
24 Larry Mzik	17:17
25 Dan O'Grady	17:08
26 Mark Vancil	17:07
27 Gary Underwood	17:06
28 Tom Iacobellis	17:08
29 Ron Ganser	16:52
30 Jim Clem	16:30
31 Emanuel Radoff	16:29
32 Richard Doig	16:21
33 Gilbert Graunke	15:13
32 John Barker	15:13
35 Dan Marek	15:13

PLACE/CONTESTANT	BEST FLIGHT
OPEN	
36 Dan Baird	15:10
37 Stan Fink	14:15
38 James Zufelt	14:09
39 David Aronstein	14:06
40 Jess Shepherd Jr.	13:48
41 Tom Vallee	13:42
42 John Voorhees	13:32
43 Fred Rash	12:57
44 Douglas Barber	12:16
45 Jerry Plassman	11:44
46 John Ganser	11:38
47 Bob Champine	10:58
48 John Fellin	10:56
49 David Raymond-Jones	09:48
50 Chester Wrzos	08:41
51 Moe Whittemore	08:38
52 John Chizmadia	07:12
53 Tony Sutter	05:14

ORNITHOPTER----------COMBINED AGES----------CD: Burr Stanton

1 Frank Kieser	14:09	2 Joseph Krush	08:37

HELICOPTER----------COMBINED AGES----------CD: Burr Stanton

1 Tom Vallee	11:17	3 John Marett	05:54
2 Ron Ganser	08:57	4 Larry Loucka	02:02

PEANUT SPEED--------COMBINED AGES--------CD: Larry Mzik

1 Chuck Markos	14.07 MPH

UNLIMITED SPEED-------COMBINED AGES-------CD: Larry Mzik

1 Chuck Markos	14.21	2 Richard Doig	12.17 MPH	3 Jerry Plassman	8.47 MPH

BOSTONIAN--------COMBINED AGES--------CD: Gordy Wisniewski

PLACE/CONTESTANT	BEST FLT	SECND BEST	TOTAL BEST 2	CHARISMA	TOTAL
1 David Aronstein	5:02	4:46	9:48	1.20	705.60
2 Richard Miller	4:20	4:14	8:34	1.16	596.24
3 Wayne Trivin	4:16	3:59	8:15	1.19	589.05
4 Red Boyles #1	4:19	3:54	8:13	1.17	576.81
5 John Marett	3:41	3:36	7:17	1.18	515.66
6 Stuart Weckerly	3:40	3:26	7:06	1.20	511.20
7 Ron Ganser	3:29	3:13	6:42	1.20	482.40
8 Judy Boyles	3:45	3:01	6:46	1.14	462.84
9 Jim Miller	3:22	3:18	6:40	1.12	448.00
10 Dick Obarski	3:16	3:09	6:25	1.14	438.90
11 Don Lindley	3:06	2:36	5:42	1.14	389.88
12 Chuck Markos	2:51	2:44	3:35	1.15	385.25
13 Paul Avery	2:46	2:32	5:18	1.16	368.88
14 John Barker	2:35	2:33	5:08	1.19	366.52
15 C. David Smith	2:39	2:34	5:13	1.00	313.00
16 Ed Konefes	2:14	2:09	4:23	1.15	302.45

PLACE/CONTESTANT	BEST FLT	SECND BEST	TOTAL BEST 2	CHARISMA	TOTAL
17 Hewitt Phillips	2:13	1:59	4:12	1.18	297.36
18 Sidney Gilbert	2:10	2:10	4:20	1.13	293.80
19 Stan Fink	2:04	2:02	4:06	1.19	292.74
20 Phillip Hartman	2:04	1:52	3:56	1.18	278.48
21 Fred Rash	1:45	1:43	3:28	1.12	232.96
22 Jim Pollard	1:52	1:48	3:40	1.00	220.00
23 Aaron Gower	1:49	1:48	3:37	1.00	217.00
24 Kenneth Crump	1:42	1:41	3:23	1.00	203.00
25 John Blair	1:50	0:58	2:48	1.15	193.20
26 Tom Iacobellis	2:41	0:00	2:41	1.16	186.76
27 Bob Champine	1:19	1:17	2:36	1.12	174.72
28 John Fellin	1:13	1:07	2:20	1.14	159.60
29 C. Wojtkiewicz	1:07	1:02	2:09	1.14	147.06
30 Edward Sullivan	0:50	0:43	1:33	1.12	104.16
31 William Clarke	0:51	0:29	1:20	1.20	96.00
32 John Ganser	0:31	0:28	0:59	1.13	66.67

AMA SCALE---------COMBINED AGES--------CD: Phil Klintworth

PLACE/CONTESTANT	SUBJECT	BEST FLT	SECND BEST	AVER BE 2	SCALE PTS	TOT
1 Jack McGillivray	SE5	90	95	90	87	177
2 Wayne Trivin	?	90	91	90	84	174
3 Jim Miller	?	90	93	90	82	172
4 Stuart Wackerly	?	90	109	90	62	152
5 George Nunez	Aeronca K	84	75	80	61	141
6 George Nunez	Rumpler	61	60	61	78	139

PLACE/CONTESTANT JUNIOR/SENIOR	SUBJECT	BEST FLT	SECND BEST	AVER BE 2	SCALE PTS	TOT
7 Ed Deloach	Fokker D-7	69	66	68	67	135
8 Don Deloach(S)	DH6	67	65	65	63	129
9 John Blair	?	40	37	39	90	129
10 James Pollard	?	55	49	52	72	124
11 Dave Rees	?	61	0	31	70	101
12 Don Deloach(SR)	BD4	0	0	0	67	0

1991 ACADEMY OF MODEL AERONAUTICS NATIONAL CHAMPIONSHIPS (cont.)
UNITED STATES INDOOR CHAMPIONSHIPS
CONTEST DIRECTOR:---A. J. Italiano

PEANUT SCALE--------COMBINED AGES--------CD: Phil Klintworth

PLACE/CONTESTANT JUNIOR/SENIOR	SUBJECT	BEST FLT	SECND BEST	AVER BE 2	SCALE PTS	TOT
1 Don Deloach(SR)	Voisin Hyd.	111	111	111	110.7	221
OPEN						
1 Don Slusarczyk	Voisin Hyd.	127	127	127	127.	254
2 Jim Miller #1	Voisin Hyd.	103	102	103	114.8	217
3 Jack McGillivray	Isaacs Fury	104	104	104	103.5	207
4 Wayne Trivin	Dumont 14bis	88	84	86	117.6	204
5 Walter Eggert	SE5	89	88	89	92.9	181
6 James Grant	CLA3	79	76	78	90.6	168
7 George Nunez #1	Sop. Tripe	54	52	53	99.0	152
8 C. Wojtkiewicz	Wright WP-1	67	67	67	78.8	146
9 Tom Nied	Bat Baboon	43	41	42	94.0	136
10 George Nenez #2	Turbo Beaver	67	67	67	67.2	134
11 Stan Fink #2	Fokker D-8	46	45	46	88.8	134
12 James Pollard	Tigermoth	63	62	63	71.4	134
13 Dr. John Martin	Waco Cabin (on floats)	66	66	66	65.6	131
14 Les Garber	Hergt Mono.	65	65	65	64.5	129
15 Dave Rees	Colibri	41	38	40	87.0	126
16 Jerry Plassman	Piper J-3	63	63	63	63.0	126
17 Stan Fink #1	Gee Bee 4	43	26	35	78.2	113
18 Ed Deloach	Dumont 14bis	68	0	34	68.3	102
19 Joe Mason	Cougar	34	34	34	34.4	69

KIT PLAN--------COMBINED AGES--------CD: Cliff Cullpepper

PLACE/CONTESTANT	SUBJECT	BEST FLT	SECND BEST	FIDEL PTS	CRAFT PTS	TOT
1 Paul Avery	Piper Vag.	90	90	55	30	270
2 John Blair	Piper Cub	85	85	50	35	255
3 Walter Eggert	Pussmoth	80	80	50	30	240
4 Dave Linstrum	Daphne	78	78	48	30	234
5 Chuck Markos	Comet Piper	73	73	48	25	219
6 Dr. John Martin	Piper Cub	74	70	45	30	219
7 Ed Deloach	Fokker D-8	67	66	49	32	214
8 Stuart Wackerly	Found	63	63	40	23	189

PLACE/CONTESTANT JUNIOR/SENIOR	SUBJECT	BEST FLT	SECND BEST	AVER BE 2	SCALE PTS	TOT
9 Tony Sutter	Porter PC-6	60	60	40	20	180
10 Ed Konefes	Found	60	60	40	20	180
11 Judy Nunez	Daphne	55	55	40	15	165
12 Tom Nied	Porter PC-6	69	0	45	30	144
13 Richard Miller	Howard DGA	0	0	50	30	80
14 Don Deloach(SR)	BD-4	0	0	48	30	78
15 Burr Stanton	Curtis Robin	0	0	45	25	70

FEDERATION ROG----------CD: Jesse Shepherd

1 Jim Clem	08:48	7 Dick Obarski	06:04	13 Anthony D'Alessandro	04:31
2 Andrew Tagliafico	08:03	8 Fred Rash	05:59	14 Stan Fink	03:35
3 David Aronstein	07:22	9 Douglas Barber	05:42	15 John Ganser	03:21
4 Wayne Trivin	07:03	10 Doc Martin	05:09	16 Tobias Feuer	02:29
5 Moe Whittemore	06:46	11 Daniel Baird	04:40		
6 Lester Garber	06:17	12 Tony Sutter	04:31		

----------1991 FEDERATION R.O.G. TEAM----------

PLACE/TEAM	MEMBERS	BEST FLIGHT	TOTAL
1 Washington	Tagliafico	08:03	15:23
	Aronstein	07:22	
2 Texas	Clem	08:48	13:19
	Sutter	04:31	
3 Florida	Trivin	07:03	13:07
	Obarski	06:04	
	Martin	05:09	
4 Tennessee	Rash	04:40	10:39
	Baird	05:59	
5 New Jersey	Barber	05:42	09:03
	J. Ganser	03:21	
6 Pennsylvania	D'Alessandro	04:31	08:06
	Fink	03:35	
7 Indiana	Whittemore	06:46	06:46
8 Minnesota	Garber	06:17	06:17
9 New York	Feuer	02:29	02:29

MINI STICK----------INMARC DURATION

1 Tom Vallee	09:07	7 Doug Barry	06:16	13 Dr. John Martin	05:23
2 Tony D'Alessandro	08:55	8 Dan O'Grady	05:54	(Shillelaghi I Noir)	
3 Laurie Barr	08:26	9 Dr. John Martin	05:41	14 Jerry Plassman	05:05
4 Wayne Trivin	07:57	(Shillelaghi II Rouge)		15 Jim Buxtin	04:34
5 Dan Belieff	07:32	10 John Ganser	05:37	16 Bill Bigge	03:56
6 Vern Hacker	06:27	11 John Blair	05:36	17 Burr Stanton	03:24
		12 Stan Fink	05:34	18 Larry Staples	03:17

MINI-STICK----------MIAMA MASS LAUNCH

LAUNCH #1 1 Tom Vallee 2 Dan Belieff 3 Laurie Barr LAUNCH #2 John Triolo

PARTICIPANTS-Daniel Baird, Laurie Barr, Doug Barry, Dan Belieff, Bill Bigge, John Blair
John Blair, Jim Buxtin, Tony D'Alessandro, Richard Ennis, John Fellin, Vern Hack
Jorgen Korsgard, Joe Krush, Richard Miller, Judi Nunez, Chuck Schultz, John Triolo
Tom Tileston, Wayne Trivin, Mark Vancil, Dr. John Martin, Team Stanton, Alice & Burr

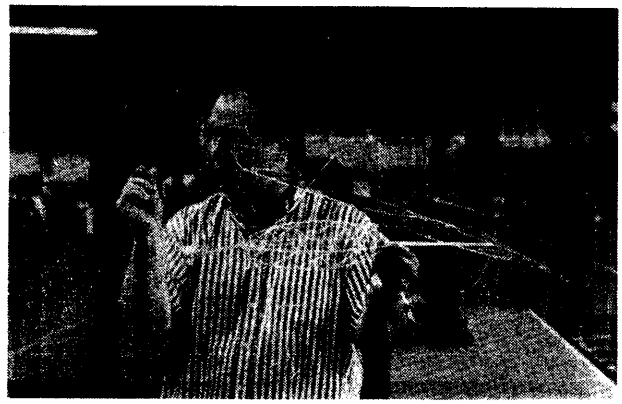
1991 UNITED STATES INDOOR CHAMPIONSHIPS - GRAND CHAMPION

PLACE/CONTESTANT	1	2	3	4	5	6	7	TOTAL
1 Jack McGillivray	93.1	88.6	81.5	100.0	68.0	75.1	94.3	600.6
2 Ron Ganser	87.3	67.5	68.3	100.0	88.4	88.0	78.9	578.4
3 Don Slusarczyk	90.5	100.0	86.3	--	100.0	93.0	99.6	569.4
4 John Marett	80.8	52.3	73.0	89.2	100.0	80.9	91.8	568.0
5 Chuck Slusarczyk	90.5	77.8	83.1	--	92.4	73.1	96.1	513.0
6 Joe Krush	65.2	51.5	52.7	78.9	73.0	90.0	68.0	479.3
7 Tom Iacobellis	71.9	67.7	--	66.2	89.5	89.6	77.1	462.0
8 Tom Vallee	69.1	100.0	--	50.7	--	84.4	93.0	397.2
9 Don Deloach (SR)	64.9	--	87.0	72.9	91.8	72.9	--	389.5
10 Larry Loucka	93.1	--	57.9	94.5	--	95.3	0.0	340.8
11 Walter Eggert	70.3	71.3	79.7	--	74.9	--	--	296.2
12 Jesse Shepherd Jr.	--	51.8	61.8	74.9	--	22.5	62.4	273.4
13 Stan Chilton	97.8	82.5	85.8	--	--	--	--	266.1
14 Tony D'Alessandro	--	70.8	78.1	96.9	--	--	--	245.8
15 Chris Forward (JR)	22.7	70.1	58.0	--	--	--	--	150.8

The Grand Champion is determined by the total points of seven events selected by the competitor from the following events:-

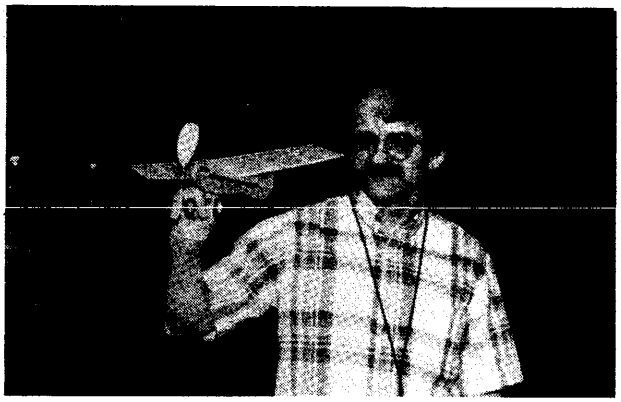
1. Hand Launched Glider
2. F1D
3. Hand Launched Stick
4. R.O.G. Cabin
5. Ornithopter
6. EZB
7. Intermediate Stick
8. Peanut Scale
9. AMA Scale
10. Pennyplane
11. Limited Pennyplane

First place is awarded 100 points and other places points equal to the percentage of winning time.

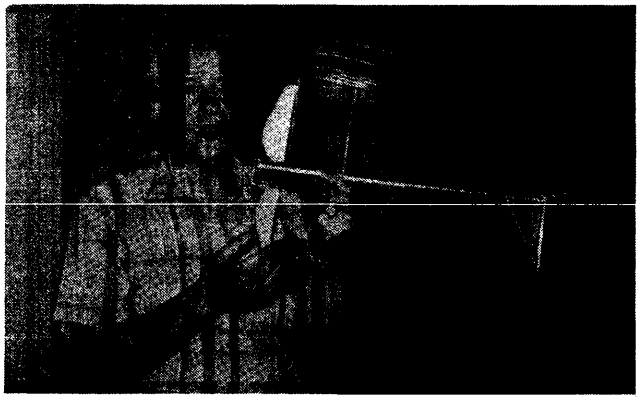


Tom Iacobellis - R.O.G. Cabin

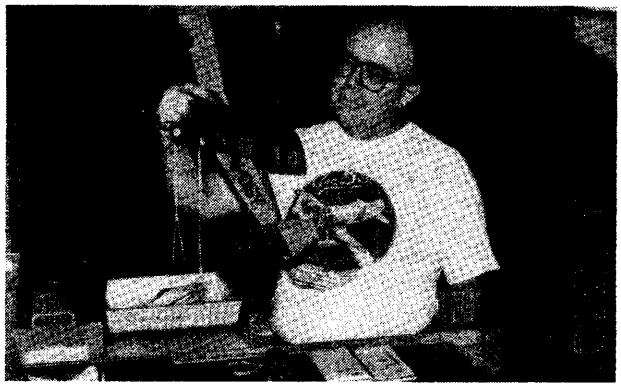
Dick Obarski - Intermediate Stick



Les Garber - Hergt Monoplane



Manny Radoff - Pennyplane
Note Unique Propellor Design



Dave Linstrum - Kit Plan - Daphne
Kit by Indoor Model Supply

Joe Krush & Frank Kieser - Ornithopters

Photos by Frank Kieser

FROM THE EDITOR

Since publishing our first newsletter in over a year, I have received encouraging notes and comments from many of our readers which I deeply appreciate. I have also received a number of inputs for publication. Since the Johnson City meet occupies most of this issue, I have saved some of the inputs for subsequent issues and I will still welcome any further inputs you think will be of interest to our readers.

I have also received a fair number of renewals but due to the expenses of starting up again, our balance is low and I would appreciate prompt renewal when it is due. Your renewal status is included in your copy.

ACTIVITIES

LAKEHURST NJ - Aug. 3,4,18,31 Sept. 1,2,15,29 Oct. 6,20 This is the 60th aniversary of indoor flying at Lakehurst. You must get on Guards' list to get in. Contact:-
Gary W. Underwood President
East Coast Indoor Modelers
9 Treelawn Terrace
Mercerville NJ 08619 - TEL 609-586-4441
Send SASE and .52c stamp ECIM Lakehurst rules

FLORIDA - Sept. 21,22 Tampa FL First meet of MIAMA season - "Doc" Martin 305-858-6363

NOTTINGHAM ENGLAND - Sept. 21,22
Interscale '91 Indoor scale meet

GREENBELT MD - GFSC Bldg. 8 Auditorium
Aug. 10,24 Sept. 14,28 Oct. 12,26 Nov. 9
Tom Vallee 444 Henryton So.
Laurel MD 20724 301-498-0790

MOSCOW ID - Kibby Dome - Cat IV Aug. 8-11
Andy Tagliafico 650-B Taybin Rd. NW
Salem OR 97304 503-371-0492

SUBSCRIPTIONS

We plan to publish this newsletter four times a year. Subscription rates include membership in the National Indoor Model Airplane Society. The following are the rates for four issues:

$ 8.00	U.S., Canada, Mexico
$ 9.00	overseas surface mail
$11.00	Air mail - Europe & S. Amer.
$12.00	Air mail - Asia, Australia, New Zealand

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

Send to: Frank Kieser
2595 Whippoorwill Ln.
Vero Beach, FL 32960
U.S.A.

SUBSCRIPTION STATUS

SUBSCRIPTION EXPIRES THIS ISSUE -----

SUBSCRIPTION EXPIRES NEXT ISSUE -----

FOR RENEWAL - See rates above
NO X - Indicates at least one more issue

GODDARD INDOOR GROUP

The Goddard Indoor Group is a small informal club of indoor fliers made up of Tom Vallee, Tex Baird, Dan Belieff, Randy Kleinert, Pete Staehling, Bill Bigge, Bill Clark, Warren Baker and Kevin Sharabonda. They fly in the Goddard Space Flight Center auditorium (Cat I) and run about about six record trials a year. Judging from their large turnout and performance at the recent USIC (see results in this issue), they are a first rate group of indoor flyers.

Over the years, the group has set a number of records at the auditorium and members have won prizes at major meets. Tom held the Cat I FAI world record from 1975 thru 1980 He also held the national records for F1D and AMA Stick almost continuously from 1975 thru 1990 when they were shattered by a great performance by Bob Randolph. Dan Belieff set records for Paper Stick, Intermediate Stick and Cabin R.O.G.. Most recently, Pete Steahling set Cat I national records for Pennyplane and Limited Pennyplane. The Pennyplane record still stands.

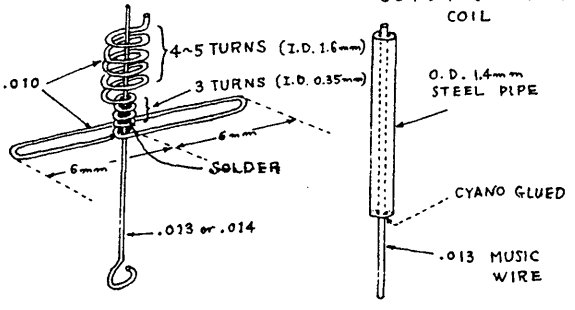
One of the Goddard Indoor Group's claim to fame is the Mini- Stick, AKA Living Room Stick. The rules for this event which are now quite widely available were created about two years ago primarily by Pete Staehling and Tom Vallee and I won't repeat them here. The first contest was held in Tom's living room. There were six contestants with a winning time around three minutes. Since then the best Cat I time is 6:24 by Tom Vallee at the NASA auditorium. Tom also had a time of 7:28 at Lakehurst.

After some discussions between Tom and Mike Colling of England at the 1990 USIC Mike set up an international Mini-Stick postal contest which had over 60 entries (results elsewhere in this issue). So you can see the tremendous popularity of this event and rightly so. The specifications seem to be just right for limited flying space and still there is real competition in the higher sites. The event is simple enough for beginners and is also a challenge to the experts. Certainly there should be consideration to making this a new AMA category. In my opinion it is better to create a completely unique category such as this rather than subdividing an existing category as has been done so often.

So congratulations to the Goddard Indoor Group and keep up the good work.

VARIABLE PITCH SPRING

Below is a variable pitch spring design by M. Misawa of Japan.



From Mike Colling - 403 Mossy Lea Road Wrightington Wigan Lancs. England WN6 9SB

Dear Competitor - First of all, Thank you for entering the first Living Room Stick Postal Contest. I hope you all had FUN in flying this little model. Please let me know if you wish another event to be run next winter.

Editor's Note -To correct for ceiling height,it appears that a height of 116 feet is given a correction factor 1.00. The correction factor for any other ceiling height is equal to the square root of (116/ceiling height).

LIVING ROOM STICK (MINI-STICK) POSTAL CONTEST 91

	PLACE/CONTESTANT	COUNTRY	CEILING HGT-FT	ACT TIME SECONDS	CORRCTD TIME
1	J. O'Donnell - O'all Ch	U.K.	7.82	295	1136
2	P. Steahling - 1 Int.	U.S.A.	18.75	370	920
3	T. Vallee - 2 Int.	U.S.A.	18.75	362	900
4	J. O'Donnell	U.K.	20.75	351	830
5	C. Hutchinson - 1 U.K.	U.K.	11.08	256	828
6	C. Hutchinson	U.K.	9.00	227	815
7	J. Godden - 2 U.K.	U.K.	20.50	337	802
8	P. Steahling	U.S.A.	18.75	313	779
9	J. O'Donnell	U.K.	22.00	335	769
10	C. Hutchinson	U.K.	13.50	259	759
11	D. Yates - 3 U.K.	U.K.	19.75	305	739
12	J. Godden	U.K.	25.00	341	735
13	R. Haywood	U.K.	22.25	309	706
14	R. Haywood	U.K.	18.50	276	691
15	J. O'Donnell	U.K.	24.80	319	689
16	D. Belieff - 3 Int.	U.S.A.	18.75	263	654
17	J. Godden	U.K.	25.00	303	653
18	J. Barker	U.K.	25.00	303	653
19	D. Belieff	U.S.A.	18.75	261	649
20	T. Faulkner	U.K.	20.50	270	642
21	E. J. Baker	U.K.	25.00	297	640
22	S. Nonaka	Japan	9.60	181	629
23	E. J. Baker	U.K.	19.75	259	628
24	M. Aoshima	Japan	9.60	180	626
25	D. Richards	U.K.	18.50	241	603
26	L. Minoru	Japan	9.60	173	601
27	M. Misawa	Japan	9.60	172	598
28	T. Faulkner	U.K.	25.00	277	597
29	B. Roberts	U.K.	18.50	235	588
30	L. G. Barr	U.K.	48.00	378	588
31	S. Kinoshita	Japan	9.60	169	587
32	R. Haywood	U.K.	14.50	207	585
33	R. T. Parham	U.K.	18.50	226	566
34	C. Hadland	U.K.	48.00	360	560
35	B. Roberts	U.K.	22.50	241	550
36	B. Roberts	U.K.	14.50	193	546
37	W. Bigge	U.S.A.	18.75	215	535
38	Y. Tanaka	Japan	9.60	152	528
39	B. Roberts	U.K.	11.80	168	526
40	S. Finch	U.K.	13.50	179	525
41	F. Ikegami	Japan	9.60	148	514
42	G. Axbey	U.K.	7.75	138	511
43	P. Lee	U.K.	17.00	191	499
44	R. Haywood	U.K.	11.80	156	488
45	R. Kleinert	U.S.A.	18.75	187	465
46	Y. Sugi	Japan	9.60	132	459
47	S. Finch	U.K.	11.08	135	385
48	T. Yatabi	Japan	9.60	110	382
49	C. J. Coolen	U.K.	30.00	187	368
50	S. Finch	U.K.	9.00	100	359
51	K. Hashimoto	Japan	9.60	103	358
52	Y. Takeuchi	Japan	9.60	102	355
53	O. Hayashin	Japan	9.60	99	344
54	K. Sharbonda	U.S.A.	18.75	136	338
55	M. Colling	U.K.	25.00	154	332
56	R. Harada	Japan	9.60	92	320
57	R. Boor	U.K.	8.50	84	310
58	M. Jakaji	Japan	9.60	86	299
59	T. Searle	U.K.	30.00	127	250
60	M. Rodkin	U.K.	11.08	60	194

From the Hangar Pilot - "Doc" Martin, Editor

RECORD BREAKING VS. CONTEST WINNING
by Jim Richmond

After Doc asked me to write about the difference between a contest model and a record trial model I was surprised to recall that I had only built two models in my whole life that were strictly intended for record trials - the big "D" Starwalker and the AROG Atrium Insect (the large and the small of it).

Asside from the fact that these models were most rewarding fliers, I also found them to be a lot of fun to build. You can give vent to your creative urges with record trials models mainly because it's no big deal if you fail to break a record right away. Also, the designs don't have to be as forgiving or reliable for you can keep trying as often as you like. The Atrium Insect was a real devil to get off the ground, with repeated flop-overs and stall-outs. Definitely not the sort of plane you would want for contest work. But it flew really nice once it was up. The Star Walker is so fragile that it can't take a tail slide or very rough air and always comes out a loser in a collision with another plane - but its super-light structure is just the ticket for record trials.

Contest models on the other hand have more stringent requirements. They must be strong and super reliable as well as being very good performers. It's that super reliable part that separates the contest model from the record type. If you can't take your contest plane out of the box and go for it without testing - you haven't arrived yet. Reliability also requires extremely fail-proof construction. That is, the tail hook shouldn't rip out, the motor stick shouldn't break, the wing post shouldn't slip in the tube, the bracing wires shouldn't slip and the tail boom shouldn't break in a tail slide.

If all such things are well taken care of, then your plane can survive to a ripe old age while you learn to get the most out of it. Mostly, the way you insure against structural failure is to pay attention when something does fail and make sure you change that feature so that it can't fail again. Some contest fliers I know would be a much greater threat if they were to heed this advice. I won't name any names but you can hold up your hand if you are guilty: broken "O" rings, ripped out front bearings, slipped plug-in tail booms and collapsed motor sticks.

So there you have it. Vive la difference.

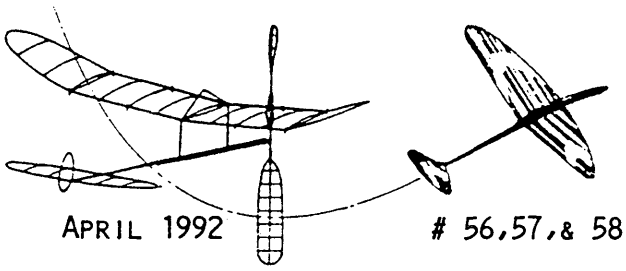
****

We can all take these words by Jim Richmond to heart and be better indoor fliers. - Editor

CONTRIBUTORS:- Richard Doig, Anthony Italiano
Dr. John Martin, Tom Vallee

THATS ALL FOR NOW - UNTIL NEXT ISSUE HAVE FUN FLYING

INDOOR
NEWS and VIEWS



APRIL 1992 # 56,57,& 58

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

Burr Stanton: A Requiem

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

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

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

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

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

Don Lindley

NEWSLETTER INFO

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

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

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

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

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

The Bean Machine

A serious Bostonian for non-serious modellers

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

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

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

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

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

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

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

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

ELEVENTH UNITED STATES INDOOR CHAMPIONSHIPS

"MINI-DOME"—East Tennessee State University

JUNE 4, 5, 6, 7, 1992

Johnson City, TN

Send entry payable to:
USIC, 4200 Royalton Road, Brecksville, OH 44141

Sponsored by
National Free Flight Society

NAME _____

STREET _____ JUNIOR ☐ SENIOR ☐ OPEN ☐

CITY _____ STATE _____ ZIP _____

PHONE _____

I hereby certify that I understand all of the rules which I will complete and will diligently follow the official AMA Safety Code as well as any that may be established on site as well as apply the use of good accepted common sense in all my flying and affairs at the contest site.

Signature _____

FEES:

Basic Entry Fee includes one event

USIC Entry—Open	$20.00	_____
Junior and Senior	1.00	_____
Additional USIC Events—Open	$5.00 each	_____
Junior and Senior	.50 each	_____

FAC ENTRY FEE FOR 1991

Open—		
$4.00/Event		_____
Banquet Friday Night	$17.50 per person	_____
* Dormitory		_____
TOTAL FEES		_____

Are you a member of NFFS ☐ Yes ☐ No

Some foreign entrants must include $10.00 insurance fee

Championships Banquest @ $17.50 per person
(Sheraton Plaza, June 5)

Dormitory at ETSU reservation:
1 person in a room/night @ $21.00
2 persons in a room/night @ 23.00
Linens per person @ $6.00

(Extra towel set @ $2.00 payable directly to dormitory custodian.) **NOTE:** You are responsible for locating a roomate. You must include full room rate or name of roomate. Include any full day rates not covered by roomate. Rebate will be made as appropriate.

CHECK FOR TOTAL FEES ENCLOSED

_____

☐ **EVENTS ENTERED** ⊗ **GRAND CHAMPION SELECTIONS**

USIC

- ☐ 201 Hand Launch Stick
- ☐ 202 Intermediate Stick
- ☐ 203 F 1 D
- ☐ 204 ROG Cabin
- ☐ 205 Manhattan
- ☐ 206 EZB
- ☐ 207 Penny Plane
- ☐ 208 Novice Penny Plane
- ☐ 209 Helicopter
- ☐ 210 Ornithopter
- ☐ 211 Autogyro
- ☐ 212 Hand Launch Glider
- ☐ 214 A-ROG
- ☐ 215 Bostonian
- ☐ 505 *Peanut Scale*
- ☐ 507 AMA Scale
  - ☐ 1 Catapult Glider
  - ☐ 2 USIC Fed. ROG
  - ☐ 3 Kit/Plan Scale
  - ☐ 4 No-Cal
  - ☐ 5 Peanut Speed*
  - ☐ 6 Unlimited Speed*
  - ☐ 7 Old Timer
  - ☐ 8 Mini-Stick & Mini Mass Launch
  - ☐ Gran-Prix (Enter on Site)

FAC.

- ☐ 1 Hi-Wing Monoplane
- ☐ 2 Biplane
- ☐ 3 WWI Combat
- ☐ 4 Golden Age

* Sponsored by Hardy Brodersen

* Please indicate reservation in approriate block:

June	2	3	4	5	6	7
1 Room						
2 Rooms						
Linens						

In case of emergency please contact:

NAME _____ PHONE _____

STREET _____

CITY _____ STATE _____ ZIP _____

Send fees to: USIC
4200 Royalton Rd.
Brecksville, Ohio 44141

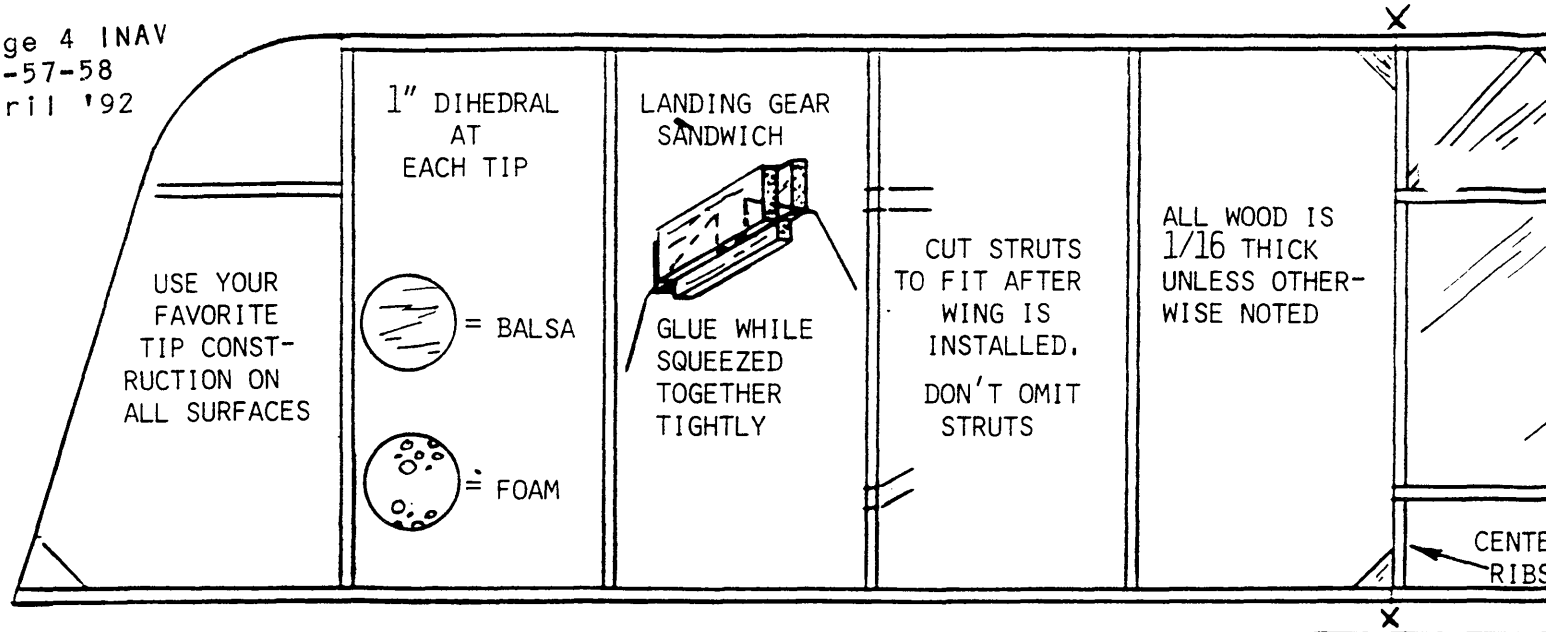
Must be postmarked by May 10, 1992
Late entry fee of $10.00 payable on site.

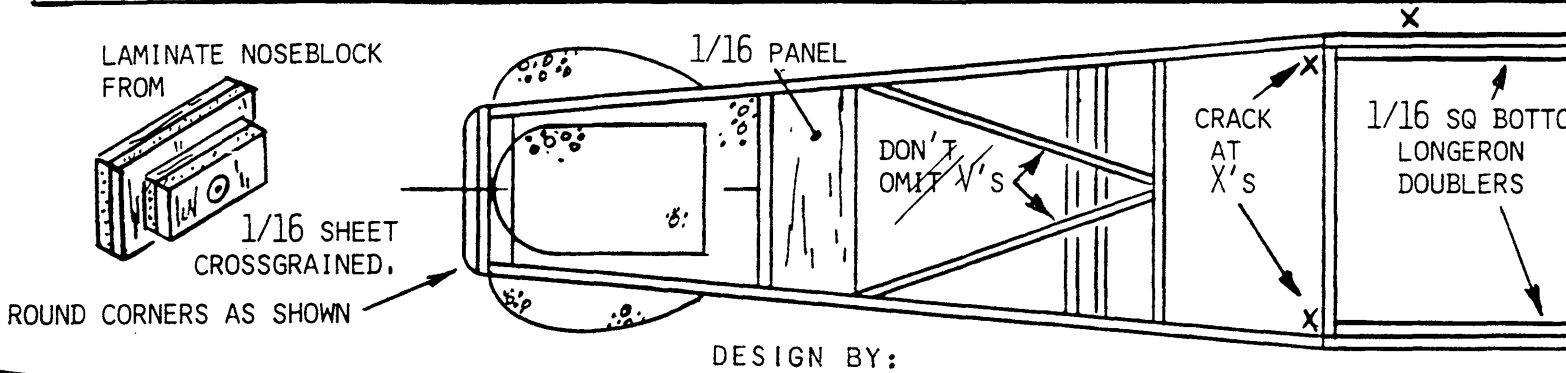
Note: You can join NFFS and AMA on premises.
It is best if you join NOW!!

DOME HOURS	7 8 9 10 11 12 1 2 3 4 5 6 7 8 9 10 11 12
THURSDAY 6/4 7:00 AM MIDNIGHT	H.L. GLIDER/ CAT. GLI. — NOVICE P.P. — INTERMEDIATE AUTOGYRO HELICOPTER OR NITHOPTER
FRIDAY 6/5 7:00 AM 6:00 PM	BOSTONIAN · NO-CAL SPEED UNLIMITED USIC FROG PEANUT SPEED — MANHATTEN PENNYPLANE — BANQUET
SATURDAY 6/6 7:00 AM MIDNIGHT	PEANUT SCALE AMA SCALE MIAMI GRAND PRIX KIT PLAN, SCALE, FAC SCALE MINI STICK MINI STICK MASS LAUNCH — FID, CABIN HAND LAUNCHED STICK OLD TIMER
SUNDAY 6/7 7:00 AM 9:00 PM	E.Z.B. — FID H.L. STICK A-ROG.

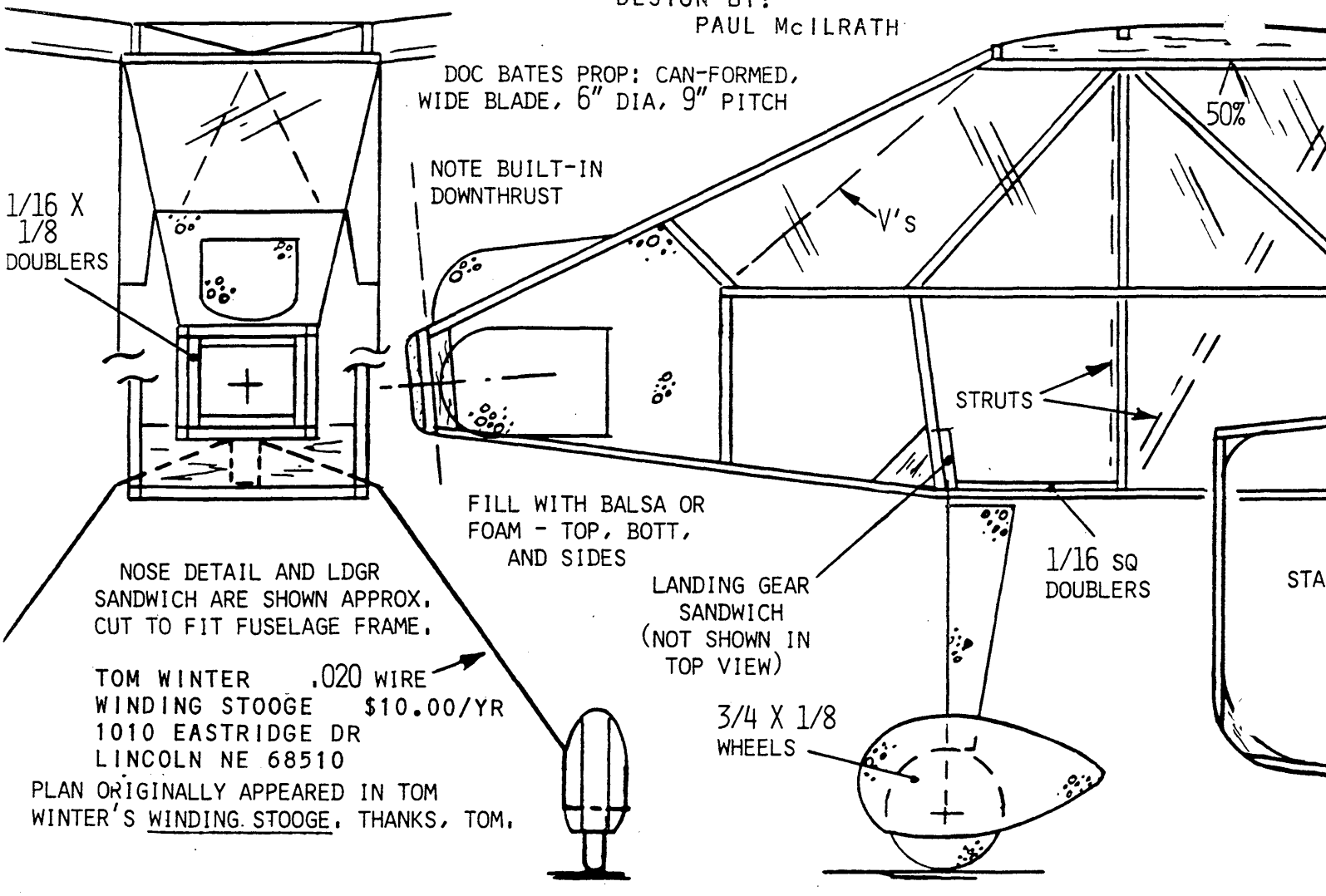
Two hotels :
Garden Plaza (very nice - near host hotel) 1-4 occ. $60.89 w tax.
1-800-3GARDEN or 1-615-929-2000 mention NFFS-U.S. Indoor Champs.
Sheraton is host hotel (banquet) sp.rate 2-3 occ. $62.01 w tax.

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





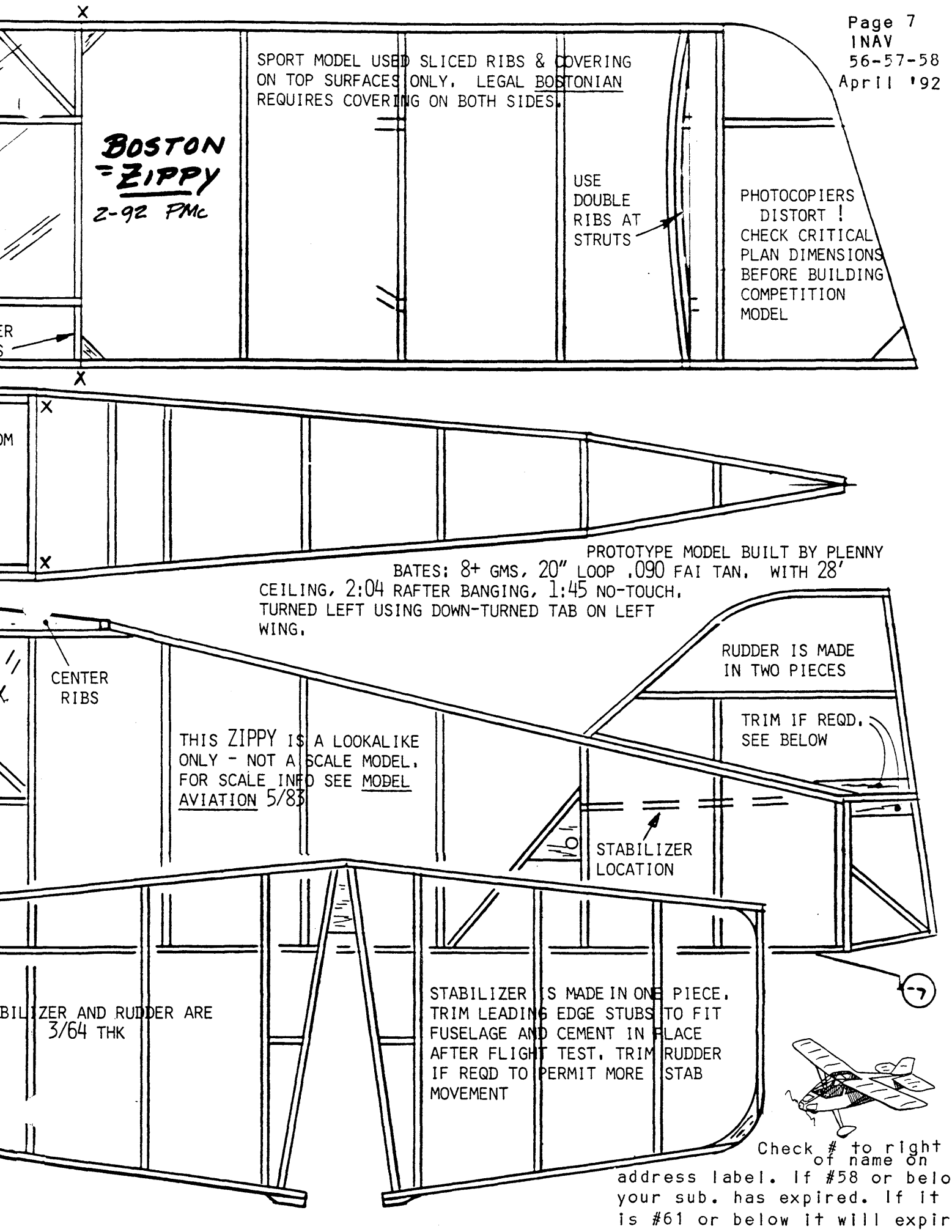
DESIGN BY:
PAUL McILRATH



NOSE DETAIL AND LDGR SANDWICH ARE SHOWN APPROX. CUT TO FIT FUSELAGE FRAME.

TOM WINTER .020 WIRE
WINDING STOOGE $10.00/YR
1010 EASTRIDGE DR
LINCOLN NE 68510

PLAN ORIGINALLY APPEARED IN TOM WINTER'S WINDING STOOGE. THANKS, TOM.



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ELEVENTH UNITED STATES INDOOR CHAMPIONSHIPS
JUNE 4, 5, 6, 7, 1992
"MINI-DOME"—East Tennessee State University
Johnson City, TN

CONTINUED FROM PAGE 5

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

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

SCALE JUDGING
Models must be submitted with documentation and contestant's name—FAC, P-Nut and Rubber Scale by 12 noon on Friday, June 5. Bostonian and KIT Plan by 7:00P on Thursday, June 4. Turn-in room located at northeast end of dome. NOTICE: Photos en mass only permitted between 12:00 to 12:30P and 7:00 to 7:30A.
NOTE: For details of the Miami Grand Prix, send a large SASE to Dr. J. Martin, 2180 Tigertail Avenue, Miami, FL 33133.

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

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

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

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

(Ceiling—116', floor—208' x 420')

Astro-turf may not be on floor.

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

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

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

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

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

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

RULES FOR FAC EVENTS

1. Two different models may be entered in each HI-wing Monoplane and Biplane event.
2. Any model entered in Hi-wing and Biplane is not eligible for WWI Combat and Golden Age.
3. No bonus points awarded in the Biplane event.
4. WWI models must have guns, rigging, and struts. Forty minimum scale points.
5. Golden Age models are of any aircraft produced from 1920–1940. Retract gear planes must have gear in down position. No race plane. Forty minimum scale points. Twenty-four inch wing span maximum.
6. Scale points awarded as follows:
   a. Construction and Details
      A maximum of 30 points will be given for general accuracy and the extent of detail, such as struts, rigging, engine cowl, exhausts, armament, etc. No cockpit or cabin interiors will be considered, except for the windscreen and instrument panel, unless a full panel is impossible due to a high thrust line.

Not much	Some of it	Most of it	All there
0–10	11–20	21–25	30

   b. Coloring and Markings
      A maximum of 20 points will be given for accuracy and extent of coloring and markings. Judging will consider items such as insignia, numbering, striping, etc., and correct coloring or serial number for a particular subject modeled. Where a model is built of a proposed design, the full scale prototype never having been built, then its color and markings should reflect its designed purpose and era of its creation. Silver colored tissue may be used to represent polished aluminum. There will not be any difference in scoring between the proper colored tissue and painted surfaces.
   c. Workmanship
      A maximum of 12-1/2 points will be given for workmanship: good covering, alignment, neatness, etc.
7. Flight Points
   A maximum of 82-1/2 flight points will be awarded for each flight as follows:
   0 to 60 seconds: one point per second
   61 to 90 seconds: 1/2 point per second
   91 to 120 seconds: 1/4 point per second
   Over 120 seconds: no points
   Three officials flights. Best flight counts. Twenty seconds is considered official.
8. Hi-wing Monoplane, Biplane, and WWI Combat have a maximum wingspan of 13".
9. WWI Combat and Golden Age are mass launched.

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

F1D AND AMA H.L. STICK

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

CATAPULT GLIDER

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

MINI STICK RULES

- Wing span 7" max.
- Wing chord 2-1/2" max
- Length, front bearing to rear most point 10" max
- Motor stick front bearing to rear hook 5"
- Stab area max 50% of wing
- All wood prop.
- Any covering except micro-film
- No exotic materials
- .43 gms/.015 oz min. wt. less rubber

- Best flight of 5 officials. 20 sec. min. 2 attempts / flight.

- Mass launch. One flight. Last one down wins.

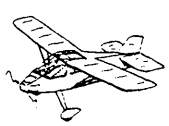
* Note: A perpetual Burr Stanton memorial trophy will be presented in Mini Stick by the I.M.A.R.C. (Indoor Model Association of River City)

NO-CAL PROFILE SCALE

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

UNLIMITED RUBBER SPEED AND PEANUT SPEED

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



KIT/PLAN SCALE

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

USIC FEDERATION ROG

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

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

SUBSCRIPTIONS

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

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

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

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

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FOR RENEWAL - See rates above

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

"WHY FOR - FOUR ?"

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

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

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

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

Limited Penny P.(18)

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

Mini Stick (14)

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

Peanut Scale (4)

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

Kit/Plan Scale (7)

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

* Bean Machine

H-L & Cat.Glider(11)

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

No-Cal Scale (11)

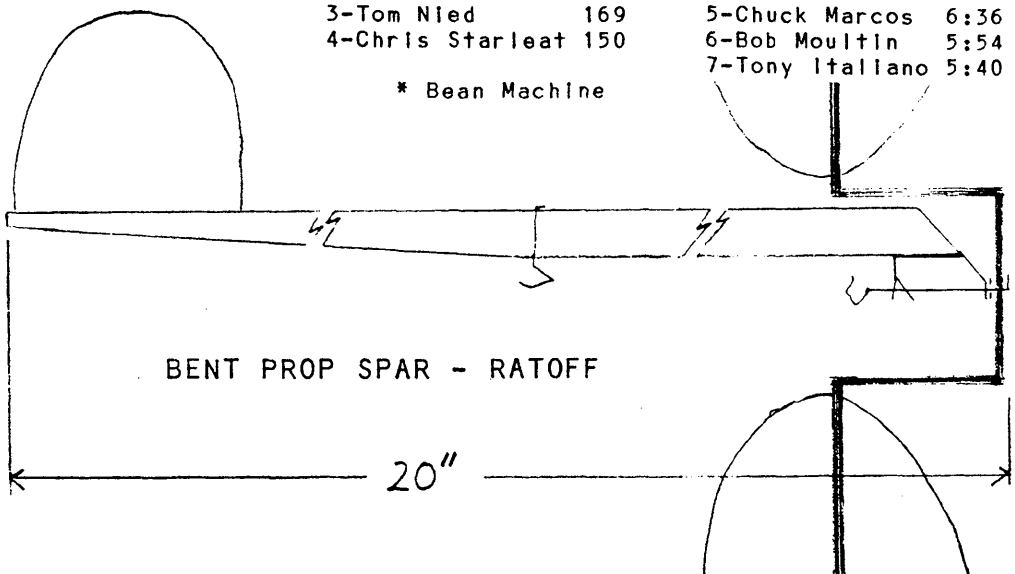
1-Terry Hreno	2:41
2-Ed Konefes	2:33
3-C. Sotich	2:12
4-Tom Nied	2:03
5-Bob Warmann	1:22
6-Joe Konefes	1:19

Bostonian (10)

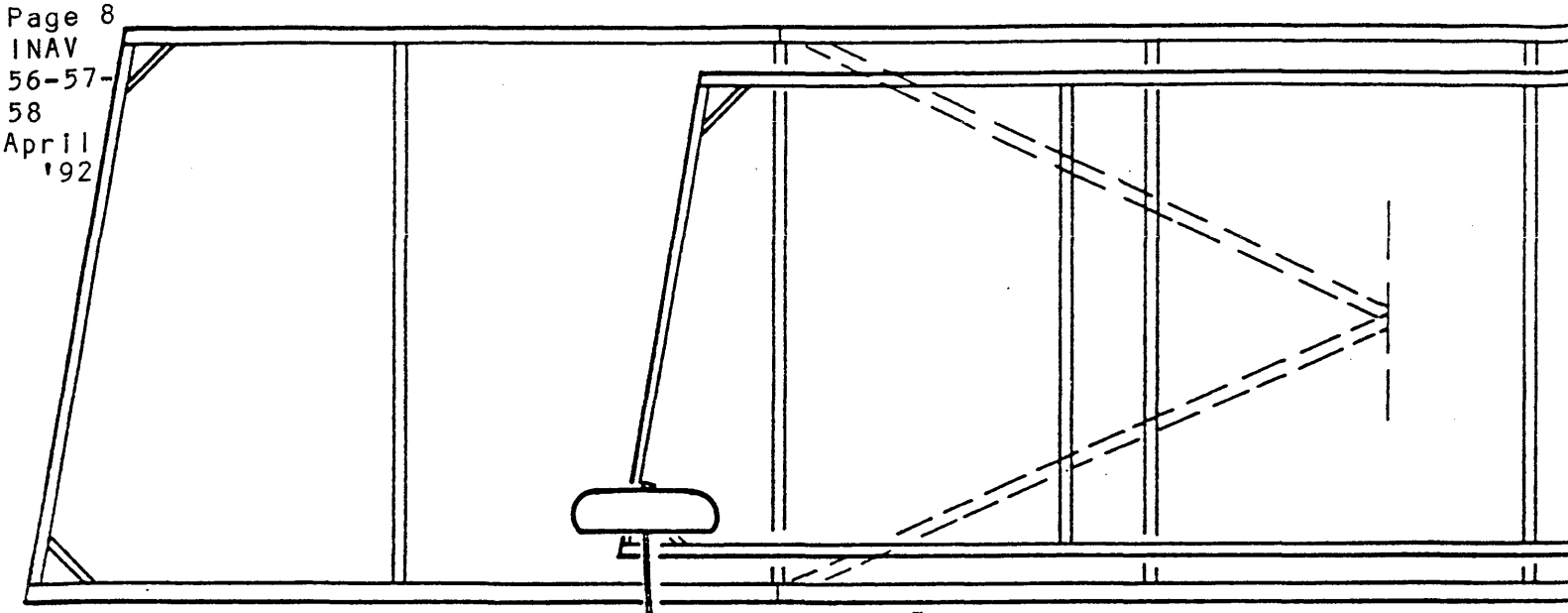
1-Chuck Marcos	310.2
2-Ken Krempetz*	187.2
3-Grant Lovett*	169.4
4-Terry Hreno	160.1
5-Joe Konefes	141.8

"Easy" B (12)

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

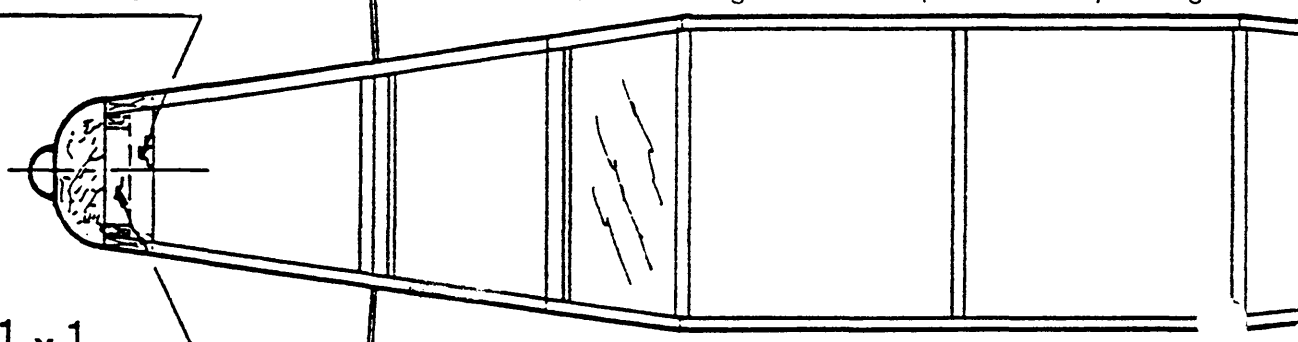


BENT PROP SPAR - RATOFF



For 7 gm plane use 7.5- 8 lb/ft^3 longerons & spars everything else

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



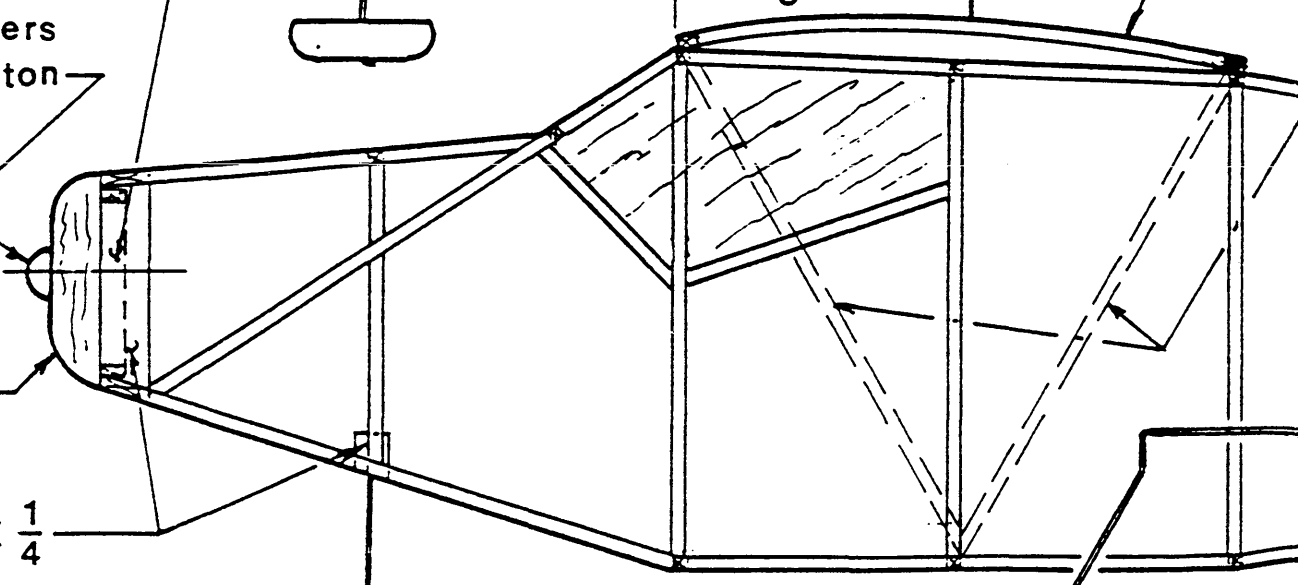
$\frac{1}{16} \times \frac{1}{8}$

Balance Point

$1\frac{5}{8}$

slice

Peck Polymers
nose button



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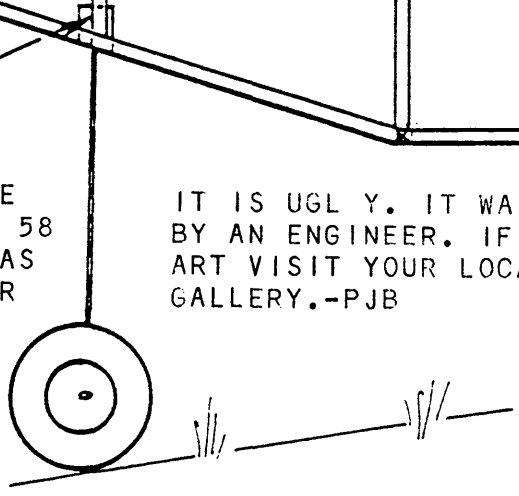
$\frac{1}{16} \times \frac{1}{4}$



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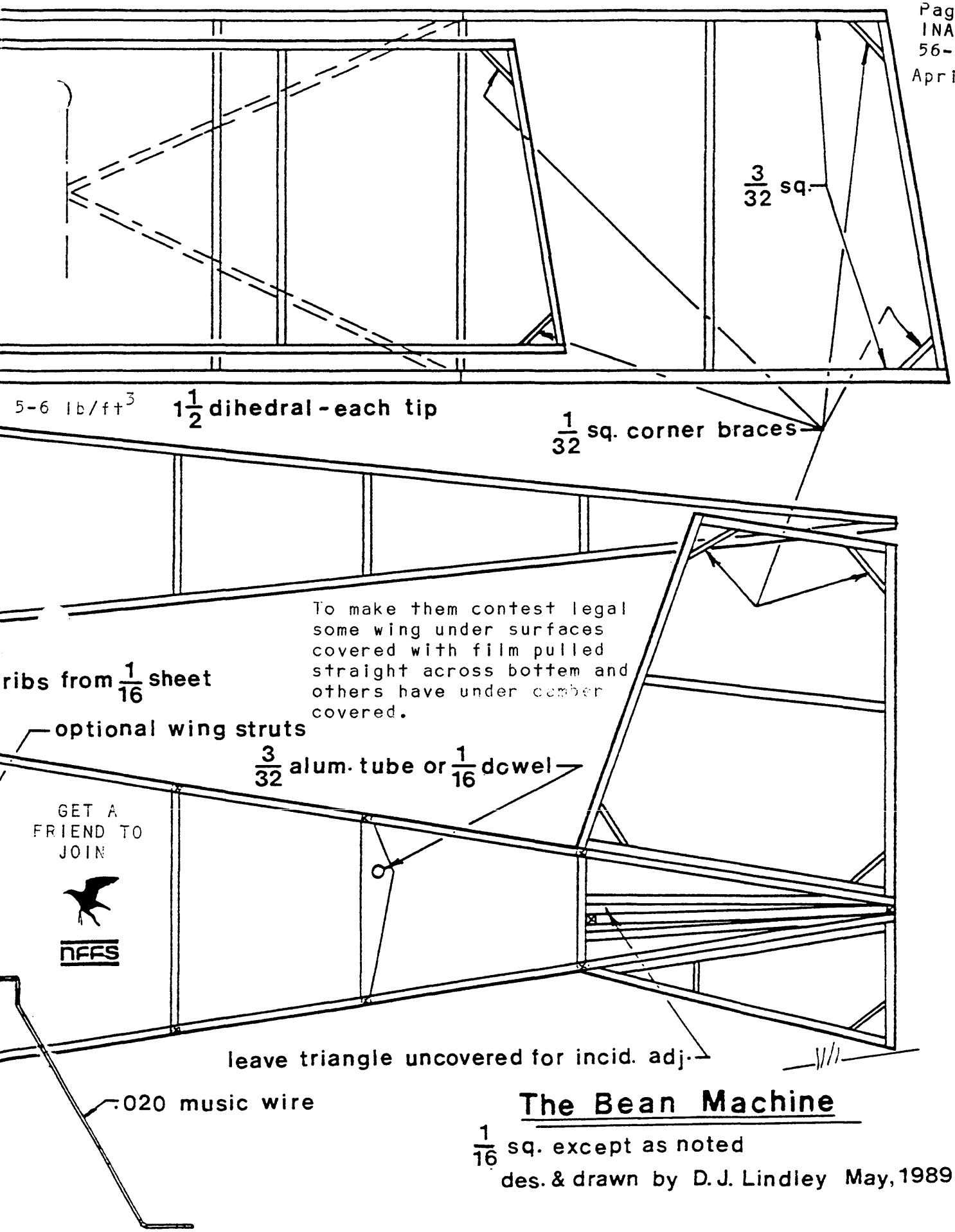


The Bean Machine

1/16 sq. except as noted

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

NATS SCHEDULE FOR INDOOR FREE FLIGHT EVENTS

By Gary Underwood

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

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

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

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

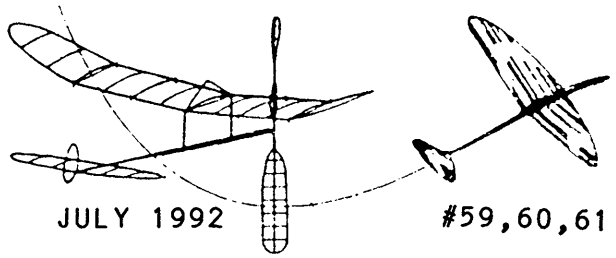
The following is the schedule submitted to AMA based on the building being open at 7 am to 9 pm. Model processing will begin at 7:30 am. The last flights for competition will be launched at 8 pm.

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

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

For further information contact AMA Headquarters.

INDOOR NEWS and VIEWS



JULY 1992 #59,60,61

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

****

FREE FLIGHT NEEDS YOU

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

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

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

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

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

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

Step forward now !!

Contact: Tony Italiano at

(414) 782-6256

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

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

****

NFFS MEMBERSHIP AND RENEWAL APPLICATION

Mail to:
NFFS
12324 Percival Street
Chester, VA 23831

Make checks payable to the National Free Flight Society

Subscription rates include annual fee of $.50 for membership in the National Free Flight Society. The balance of the fee in each category is for Subscription to FREE FLIGHT, the NFFS Digest. Subscriptions are not available without membership.

MEMERSHIP FEES AND SUBSCRIPTION RATES (1 and 2 yr.)

Age 19 & over and residents of foreign countries.	1 yr. $15.00 ($.50 membership fee plus $14.50 subscription)	
	2 yr. $27.00 ($1.00 membership fee plus $26.00 subscription)	
Age 18 & under.	1 yr. $7.50 ($.50 membership fee plus $7.00 subscription)	
	2 yr. $13.50 ($1.00 membership fee plus $12.50 subscription)	

Subscriptions are not available without membership.

Ages are as of July 1 of the current year. Please circle applicable fees.

New member ☐ Renewal ☐ Address change ☐

Current expiration date: Mo. Yr.

AMA#

Name

Address

City, State Zip

Just do it ! Join the NFFS

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

SUBSCRIPTION STATUS

SUBSCRIPTION EXPIRES THIS ISSUE ☐

SUBSCRIPTION EXPIRES NEXT ISSUE ☐

FOR RENEWAL - See rates above

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

BONUS ISSUE BONUS ISSUE

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

EAST EUROPE

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

CHECK ON THE EDITOR

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

PEANUT SCALE - OPEN-

CD:P.KLINTWORTH

	SUBJECT	BEST MAX	2ND MAX	AVERAG BEST	SCALE POINTS	TOTAL POINTS
1 Don Slusarczyk	1911 Voison Hydroplane	142.8	132.0	137.4	148.32	285.72
2 Jack McGillivray	Isaac's Fury	136.7	135.0	135.9	136.71	272.57
3 Jim Miller	1911 Voisin	84.3	82.6	83.4	144.90	228.35
4 Bill Henderson	Bleriot VII	105.6	105.6	105.6	105.60	211.20
5 Roy Bourke	Farman	85.8	79.5	82.7	125.93	208.58
6 Dr. John Martin	Astra Kampferer 1908	85.4	81.2	83.3	121.00	204.30
7 Wayne Trivin	Santos Dumont 14 bis	65.0	64.0	64.5	137.76	202.26
8 Juegen Kortenbach	Curtiss P40 Kittyhawk	85.0	80.6	82.8	112.70	195.50
9 Randy Kleinert	Lacey M10	88.0	85.5	86.8	100.80	187.55
10 Dave Rees	Corona Cougar	67.0	59.2	63.1	116.13	179.28
11 Michael Thompson	Lacey M10	88.4	88.4	88.4	88.40	176.80
12 Stan Fink	Fokker D VIII	52.5	41.1	46.8	116.16	162.96
13 George Nunez	Blackburn Bluebird III	68.0	0.0	34.0	128.16	162.16
14 George Nunez	Sopwith Triplane	40.8	0.0	20.4	136.71	157.11
15 Jerry Plassman	Piper J3 Cub	79.0	64.1	71.5	78.96	150.49
16 Stuart Weckerly	Stout 2AT transport	67.2	67.2	67.2	67.20	134.40
17 Joseph Coles	Pietenpol Air Camper	33.0	29.0	31.0	95.89	126.89
18 Mason Plank	Waco Sre Bipe	0.0	0.0	0.0	98.70	0.00
19 Al Backstrom	Payen AP 10 V2	0.0	0.0	0.0	100.32	0.00
20 Carl Hedley	Taylor Cub	0.0	0.0	0.0	107.55	0.00
21 Keith Fulmer	Lacey M10	0.0	0.0	0.0	104.85	0.00
22 Bob Platt	Bristol Scout "D"	0.0	0.0	0.0	93.28	0.00
23 Jim Grant	DNP	0.0	0.0	0.0	-	0.00

PEANUT SCALE - JR-SR-

1 Chris Sydor	Bebe Jodel	47.0	46.0	46.5	64.75	111.25

- AMA SCALE----------

CD:PHIL KLINTWORTH

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

- FAI RUBBER---------

CD: A. TAGLIAFICO

	BEST FLIGHT	SECOND FLIGHT	TOTAL BEST 2
1 Richard Doig	00:38:02	00:37:13	01:15:15
2 Gary Underwood	00:32:29	00:32:17	01:04:46
3 Larry Loucka	00:32:23	00:31:23	01:03:46
4 Laurie Barr	00:31:27	00:31:16	01:02:43
5 Bill Hulbert	00:30:17	00:28:56	00:59:13
6 Jack McGillivray	00:29:49	00:29:15	00:59:04
7 Tom Vallee	00:29:09	00:26:29	00:55:38
8 Jess Shepherd, Jr.	00:28:40	00:26:26	00:55:06
9 Jim Grant	00:27:13	00:23:09	00:50:22
10 Paul Couture	00:23:05	00:20:10	00:43:15
11 Vern Hacker	00:26:32	00:16:32	00:43:04
12 Randy Kleinert	00:18:41	00:14:33	00:33:14
13 Dan Belieff	00:28:57	00:00:00	00:28:57
14 Stan Chilton	00:28:31	00:00:00	00:28:31
15 Edward Burke	00:14:10	00:13:44	00:27:54
16 Bob Platt	00:00:00	00:00:00	00:00:00
17 Billie Landrum	00:00:00	00:00:00	00:00:00
18 Joseph Krush	00:00:00	00:00:00	00:00:00
19 Bernard Hunt	00:00:00	00:00:00	00:00:00
20 Terry Cowgill	00:00:00	00:00:00	00:00:00

- R.O.G. STICK---

CD: ?

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

KIT/PLAN SCALE HANDLAUNCH & CATAPULT GLIDER SEE PAGE 4

INTERMEDIATE STICK

CD: MIKE THOMPSON

	1
1 Lawrence Coslick	29:34
2 Don Slusarczyk	29:32
3 Stan Chilton	29:28
4 Robin Bailey	27:58
5 Dan Belieff	27:19
6 Gary Underwood	26:57
7 Dick Obarski	25:47
8 Bernard Hunt	25:42
9 Laurie Barr	25:12
10 Jim Grant	24:20
11 Jack McGillivray	23:29
12 Bill Henderson	22:18
13 Dan O'Grady	21:45
14 Ron Ganser	21:39
15 Randy Kleinert	21:36
16 Joseph Krush	21:35
17 Howard Henderson	20:06
18 Larry Loucka	20:03
19 Jess Shepherd, Jr.	19:12
20 Joseph Nuszer	18:47
21 Chuck Markos	18:45
22 Tom Vallee	18:20
23 Andrew Tagliafico	17:57
24 John Barker	16:26
25 John Marett	16:20
26 Walter Van Gorder	14:46
27 David Raymond-Jones	09:45
28 Edward Burke	07:48
29 Vernon Hacker	04:35
30 Chester Wrzos	00:00
31 John Voorhees	00:00
32 Chuck Slusarczyk	00:00
33 Wally Simmers	00:00
34 Phillip Hartman	00:00
35 Lew Gitlow	00:00
36 Jim Forward	00:00
37 Douglas Barber	00:00

-JR-SR---

1 Peter Kearney (SR)	11:20
2 Chris Sydor (JR)	07:45
3 Kris Forward (JR)	00:03

- BOSTONIAN----

CD: DAN BELIEFF

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

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

CD: G. WISNIEWSKI

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

NO-CAL SCALE------

CD: JERRY NOLIN

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

- OLDTIMER STICK--

CD: TONY ITALIANO

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

- HELICOPTER-

CD: DON LINDLEY

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

FEDERATION ROG--

CD: ED BURKE

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

-STATE TEAMS-

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

- EASY B - OPEN-----

CD: CLIF CLUPEPPER

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

JR-SR

1	Peter Kearney	(SR)	16:43
2	Erick Sears	(JR)	13:35
3	Chris Sydor	(JR)	10:53
4	Kris Forward	(JR)	05:03

-- UNLIMITED SPEED--

CD: TOM VALLEE

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

PEANUT SPEED---

CD: TOM VALLEE

		MPH
1	Chuck Markos	13.28
2	Mike Thompson	9.35
3	Randy Kleinert	0.00
4	Dr. John Martin	0.00
5	Bill Henderson	0.00
6	Millard Wells	0.00

- MINI STICK---

CD: MASON PLANK

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

HAND LAUNCH STICK -OPEN

CD: A. TAGLIAPICO

1	Richard Doig	39:13
2	Bernard Hunt	39:10
3	Don Slusarczyk	37:16
4	Dan Belieff	33:32
5	Stan Chilton	30:55
6	Tom Vallee	29:52
7	Jess Shepherd, Jr.	29:19
8	Jim Grant	28:32
9	Gary Underwood	27:17
10	Vern Hacker	16:19
11	Edward Burke	14:45
12	Manny Radoff	13:12
13	Joe Krush	07:36
14	Bob Platt	00:00
15	Larry Loucka	00:00
16	Billie Landrum	00:00
17	Terry Cowgill	00:00

JR-SR

1	Peter Kearney	(SR)	16:32
2	Chris Sydor	(JR)	00:00

PENNYPLANE - OPEN-

CD: PHIL KLINTWORTH

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

-JR-SR------

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

AUTOGYRO-----

CD: DON LINDLEY

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

MANHATTAN CABIN--

CD: ABRAM VAN DOVER

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

LIMITED PENNYPLANE - OPEN

CD: WALT ERBACH

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

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

- ORNITHOPTER--

CD: DON LINDLEY

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

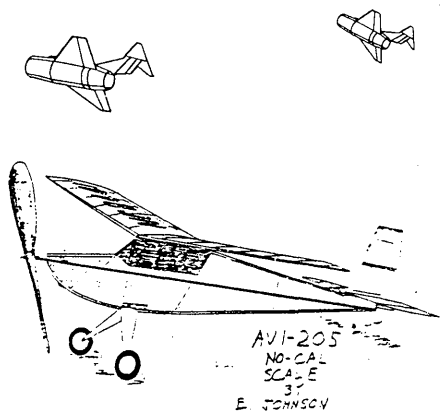
RESULTS USIC '92

KIT/PLAN SCALE-
CD: S.FINK & R.GANSER

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

HAND LAUNCH GLIDER - OPEN

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



HAND LAUNCH GLIDER - JR

		BEST FLIGHT	SECOND FLIGHT	TOTAL BEST 2
1	Chris Sydor	52.1	49.7	101.8
2	Kris Forward	16.0	7.0	23.0

HAND LAUNCH GLIDER -SR--

1	Peter Kearney	45.6	44.8	90.4
2	Benjamin Knight	38.3	37.5	75.8

RESULTS USIC '92

CATAPULT GLIDER---
CD: DOUG BARBER

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

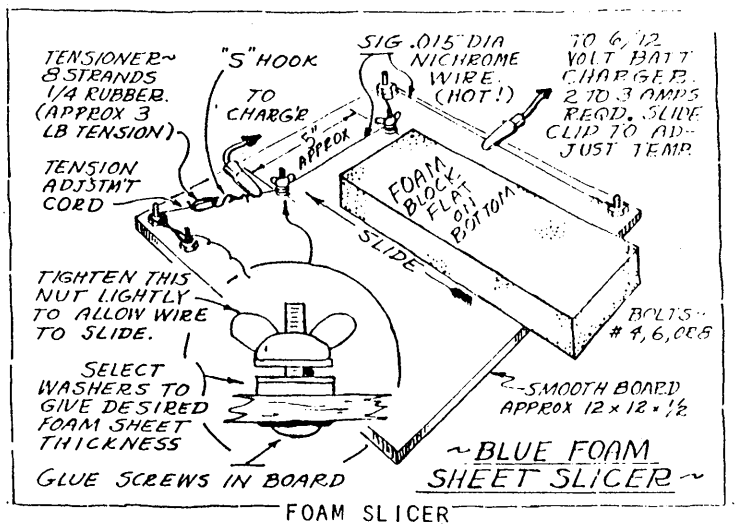
USIC Grand Champion
Don Slusarczyk

LITTLE KNOWN PLANS SOURCE

FLYING START
10460 AMBASSADOR DRIVE
RANCHO CORDOVA CA 95670

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

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



FOAM SLICER
from: the Winding Stooge ed. Tom Winter
1010 Eastridge DR, Lincoln, NE, 68510

by Paul McIlrath

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

PHOTOS TAKEN AT USIC 1992

Page 7

1 Dave Rees - Zippy Sport - Cocoanut Scale Winner of mass launch.

2 Dave Rees - Corona Couger - Peanut Scale All of the tissue trim details do not show

3 Dave Linstrum - Dornier Komet as built by Kawasaki - Kit-Plan-Scale - Doc Martin plan - Krylon silver spray on condenser paper per plan. "Brrm Brrm" don't laugh you do it too

4 Jack Boone - Taylorcraft - Kit-Plan-Scale - Joe Konefes plan for Comet kit

5 Paul Avery - (L) Wright Type "L" biplane (R) waterman Gosling - Pistachio Scale - Ken Johnson plans

6 Paul Avery - Huntington H-12 - Kit-Plan-Scale - Walt Mooney plan

7 Joe Coles - Corbin Super Ace - Kit-Plan-Scale - Megow plan

8 Paul Avery - With a Manhattan but they all look the same so cut that out - He looks happy, why not ? - Won or did well in everything he entered - Student of Ken Johnson, Richard Miller and other top modelers

9 Jim Miller - Scale judge - Big Job

Page 8

10 Dr. John Martin - Messerschmitt M 20 B - Pistachio - Time one minute

11 Wayne Trivin - Santos Dumont 14 Bis - a photo cannot do it justice

12 Jim Clem - Limited Penny Plane - own design

13 Phil Hartman - "Boston Robin"

14 Larry Coslick - Unlimited ROG Speed - winner Rolled tube fuse., Symetrical wing set 0/0 with stab., 13.5 inch loop 0.180 inch rubber, Peck 6" plastic prop cut to 5.5 inches

15 Millard Wells - Ford 2 AT - "Miss Grand Rapids" - Cocoanut Scale

16 Goerge Nenuz (I hope, PJB) - Potez (French from 1930's)-Cocoanut Scale - # 2 mass launch

17 John Barker - Scimitar - Bostonian - Lives close to G. Perryman - Just going through Smyrna GA you can catch the Scimitar virus

18 Bruce Kimbell and Friend - Sorry this was first picture on roll # 1 and I failed to get name. Write a letter and a correction will be in next issue

Page 11

19 Laurie Barr - Manhattan - from Great Britain

20 Les Garber - Open Penny Plane

21 Ed Konefes - "Red Wing"- Pree WW II build on the plan - First generation Delta Dart

22 Richard Miller - Flounder Type Bostonian of Aronstein type - 4:30 & 4:24 on 57 inch loop of 0.093 inch FAI Tan

23 Jim Miller - PAMA - Golden Age

24 Ferrell Papic - Morane-Saulnier (N ?) - as built for Royal Air Force - Electric

25 Jim Forward and his well organized bench

26 Stan Chilton checking prop pitch with well thought out and unique pitch gauge

27 Gil Coughlin - P. Payret R. Mauboussin

28 Norman Reece - Monocoupe Series 90

Page 12

29 Tom Vallee - Two Mini-Sticks - Happy just did 9:19 Next flight lost in the beams forever - could not see it from any angle - International Mini-Stick postal will have 11 countries participating - Tom developed the mini-stick that was promoted so well by the late Burr Stanton - He is very happy to see the continued high level of interest in the class

30 Bill Henderson - Manhattan - Canada

31 Dr. Walter Erbach Limited Penny Plane Contest Director checking wing span on one of the entries

32 Stan Fink - Fokker D VIII - Peanut - Get a load of that tissue coloring

33 Artie Jessup - "Blue Fin" - Bostonian - Richard Miller design "Flounder" type - see # 22 for Miller's credit statement

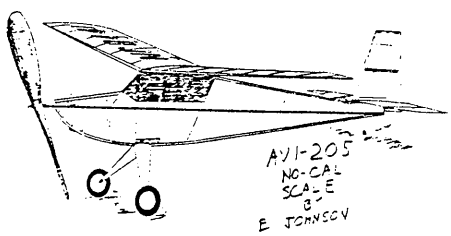
34 Wayne Trivin - Manhattan - see # 11 for some of his scale work

35 Stan Chilton - Mini-Stick - first in mass launch - Note web below wing

36 Al Backstrom - Payen AP 10 - Peanut - Al had a number of unusal types and all looked good

37 Stuart Weckerly - Stout 2 AT Transport - Peanut

38 Stuart Weckerly - Found Centennial on Floats - Good flyer have report it flew even better outside at the FAC NATS



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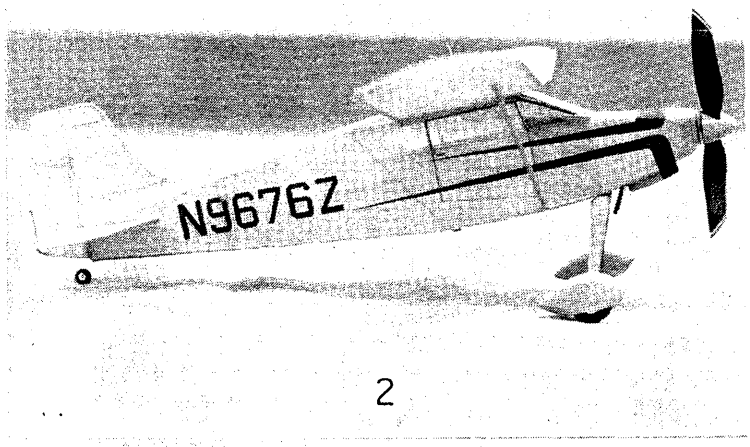

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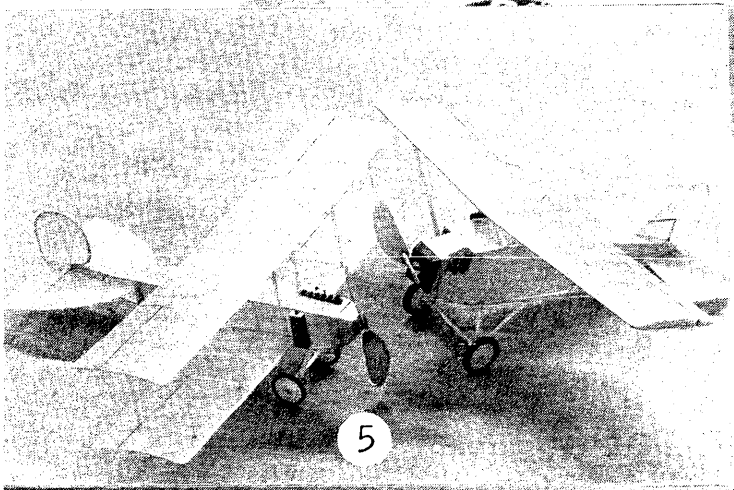

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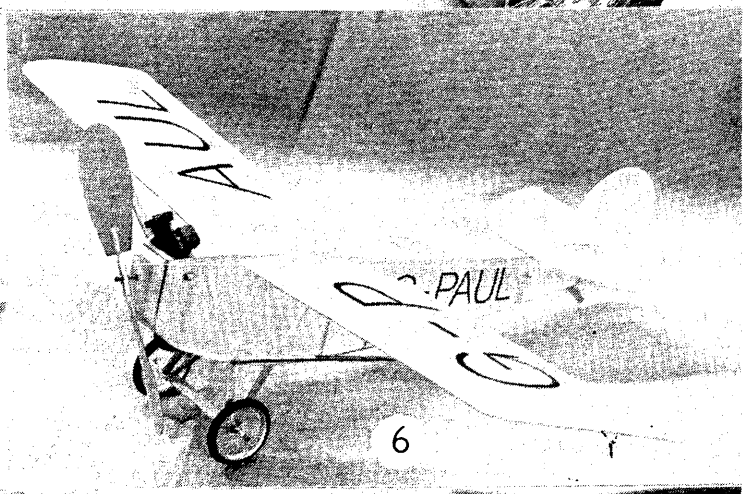

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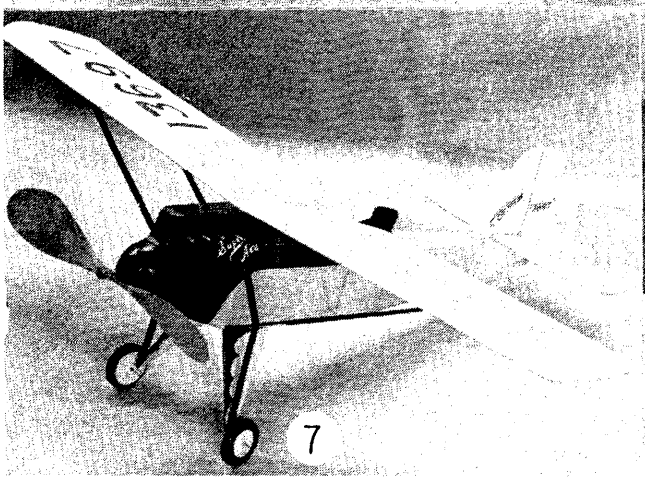

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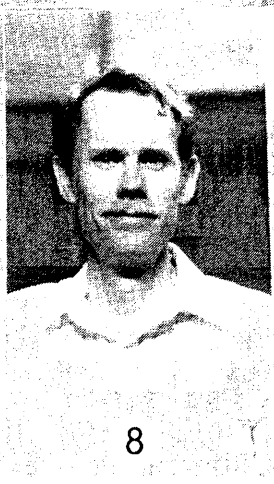

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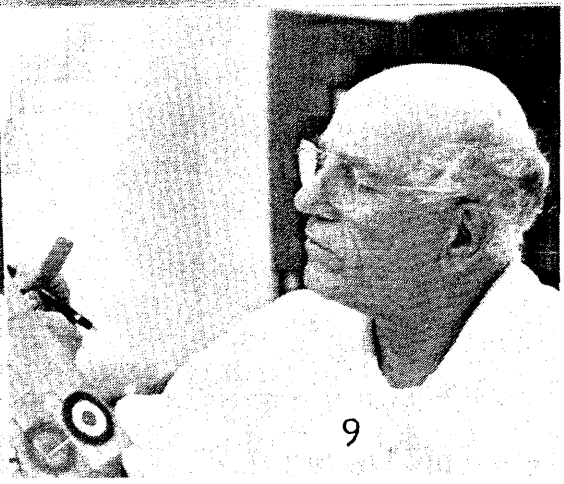

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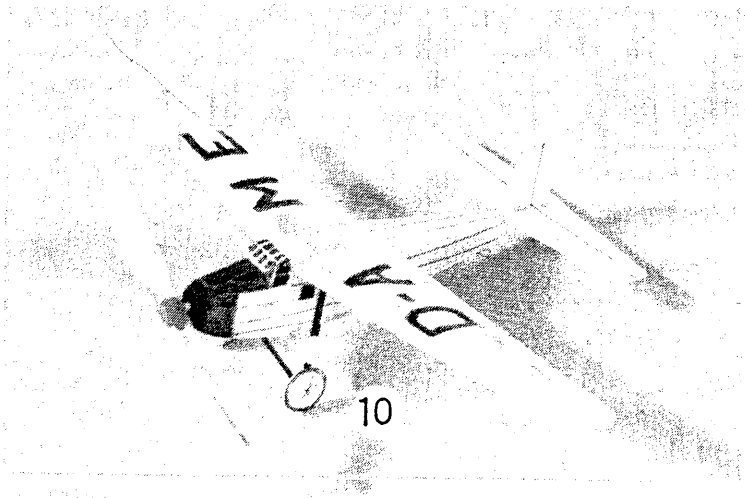

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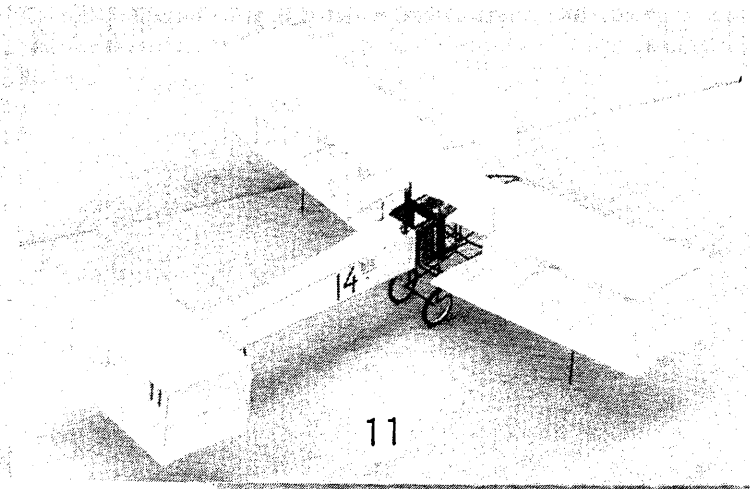

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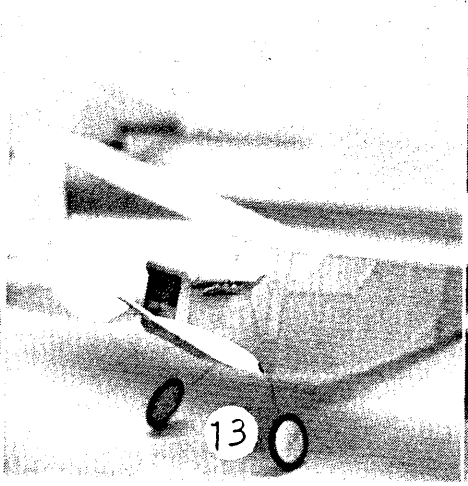
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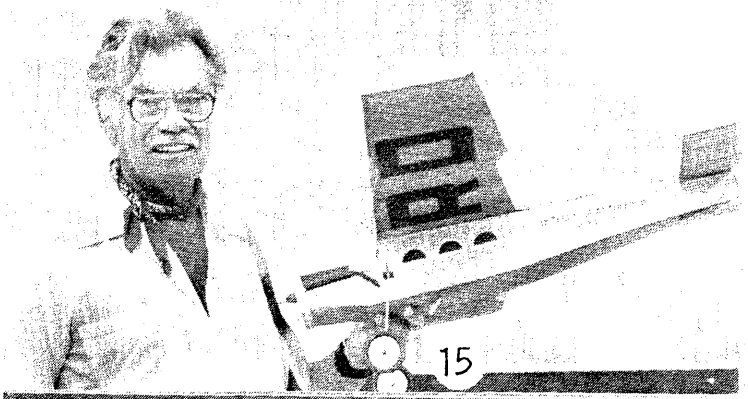
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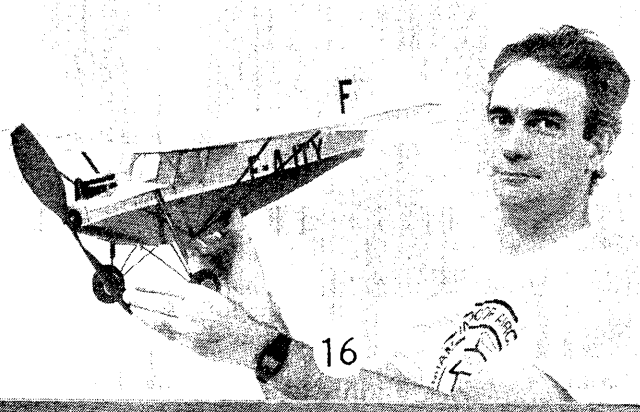

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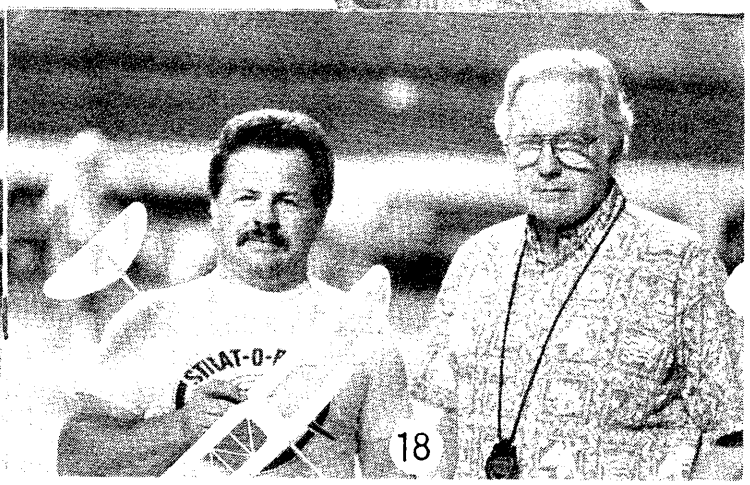
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The heart of the model is the duct and fan assembly. The challenge is to make the duct light, truly round, and clean on the inside. Note that I did *not* say "strong". This model was built using the "zero-strength, zero-weight" structural concept.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

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

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

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

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

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

The duct is covered on the outside only,

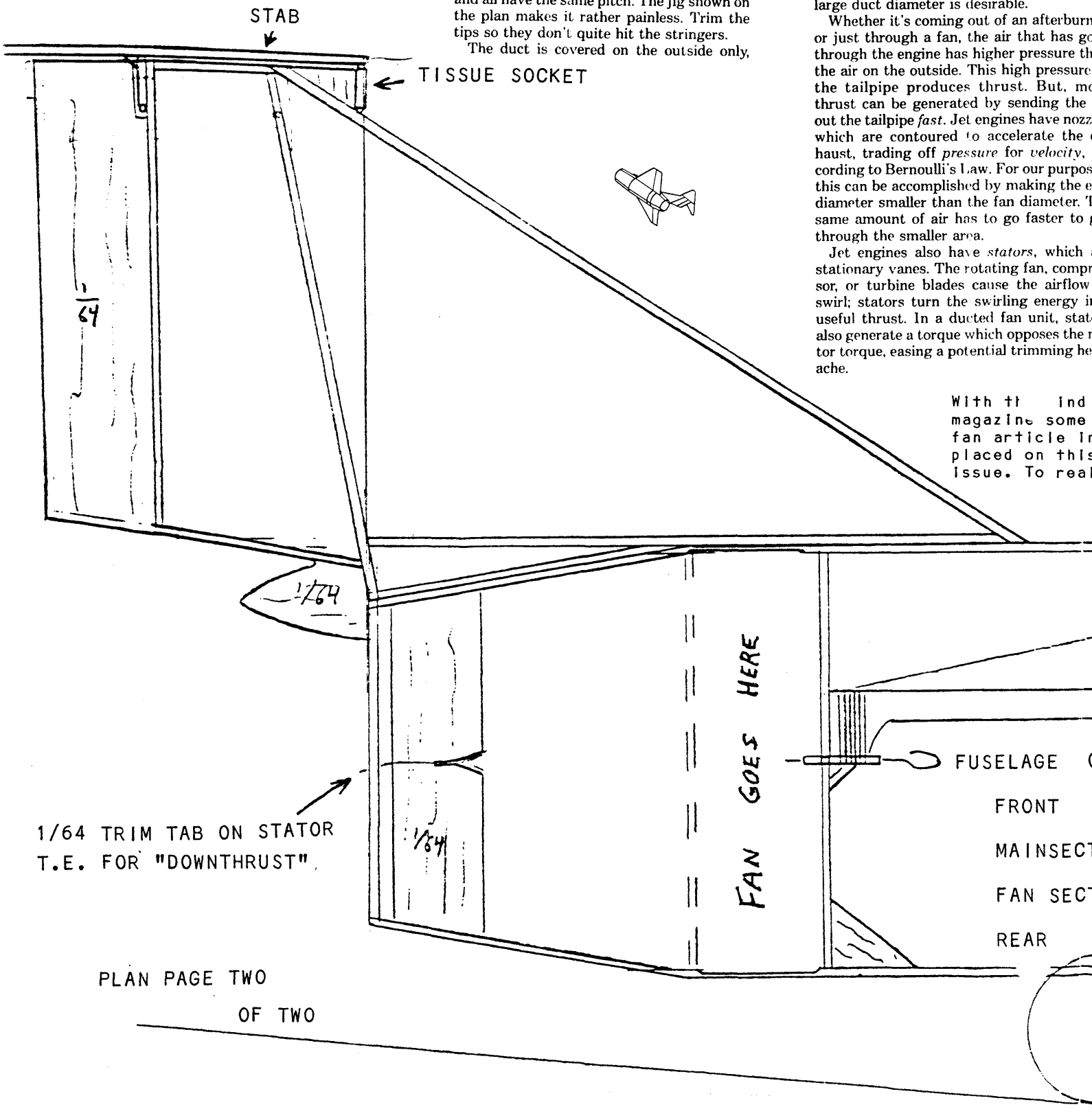
what are the best inlet/fan/exit area ratio An article in the 1953 *Frank Zaic Yearbo* suggests the following: exit area 50% to 90 of fan area, inlet area 120% to of e area (but presumably no larger than the f area). I tried to calculate the optimum ex to-fan area ratio, but this proved to be "nc trivial". Non-trivial is a word used by mat maticians, and it can mean anything fr very difficult, to "I could solve it with a s percomputer", to impossible.

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

Whether it's coming out of an afterburn or just through a fan, the air that has go through the engine has higher pressure th the air on the outside. This high pressure the tailpipe produces thrust. But, mo thrust can be generated by sending the out the tailpipe *fast*. Jet engines have nozz which are contoured to accelerate the haust, trading off *pressure* for *velocity*, cording to Bernoulli's Law. For our purpos this can be accomplished by making the e diameter smaller than the fan diameter. T same amount of air has to go faster to g through the smaller area.

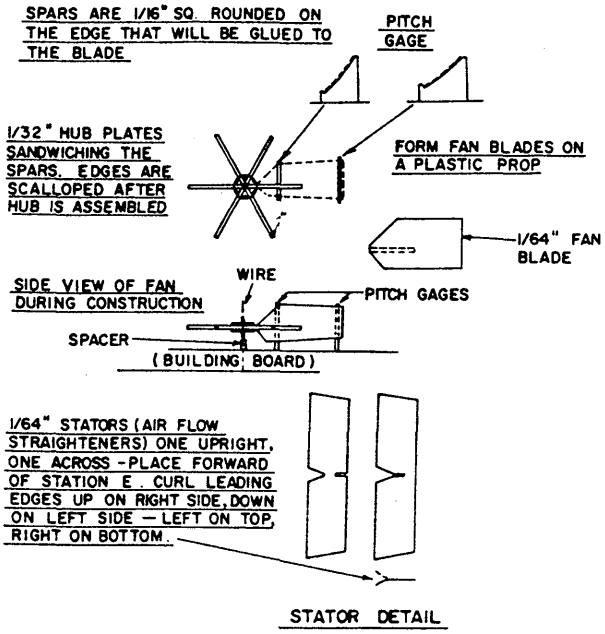
Jet engines also have *stators*, which stationary vanes. The rotating fan, compr sor, or turbine blades cause the airflow swirl; stators turn the swirling energy i useful thrust. In a ducted fan unit, stat also generate a torque which opposes the r tor torque, easing a potential trimming he ache.

With th ind magazine some fan article ir placed on this issue. To real



PLAN PAGE TWO

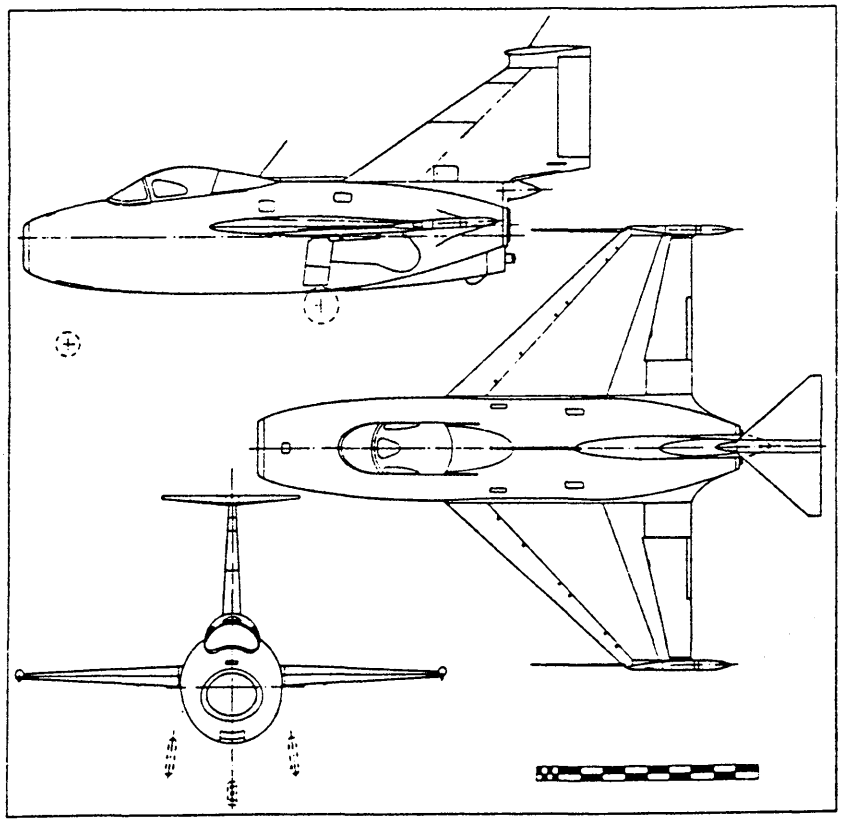
OF TWO



DELTA ONE

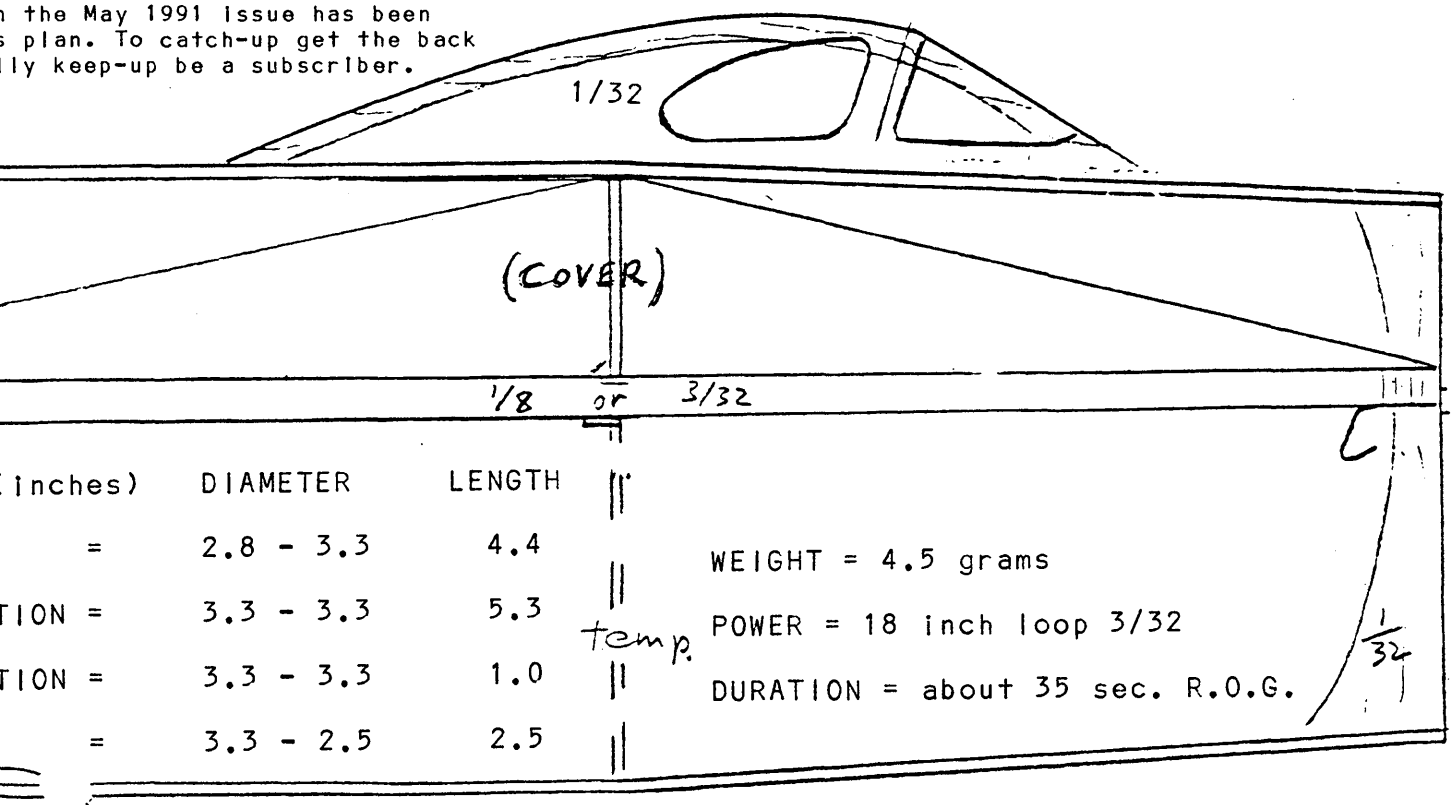
by

DAVID ARONSTEIN



Delta One

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



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

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

FLYING MODELS is a great general interest model magazine. Lots of gum band stuff.
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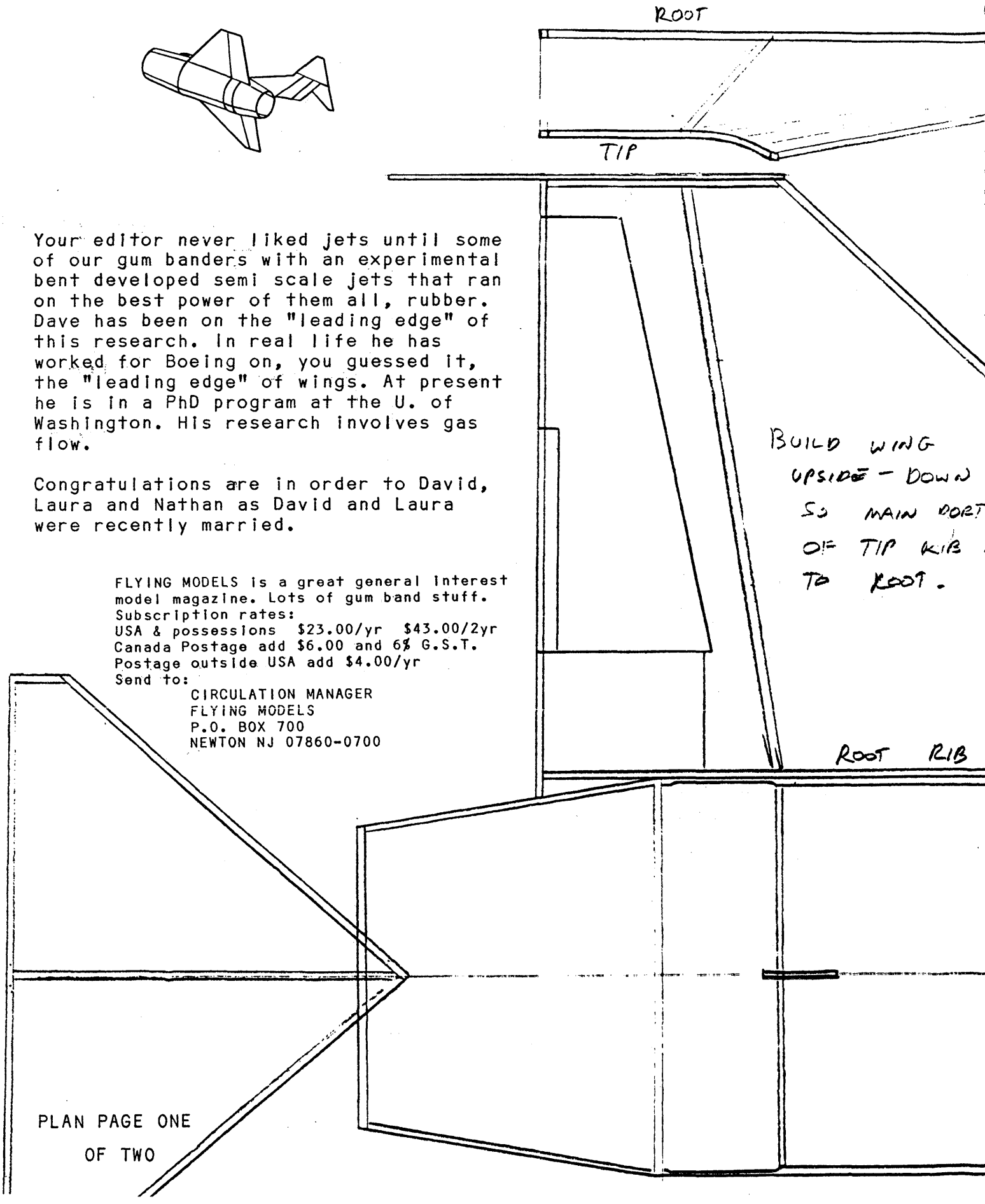
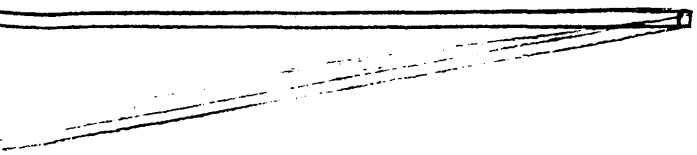
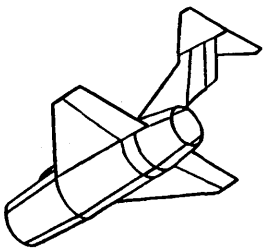
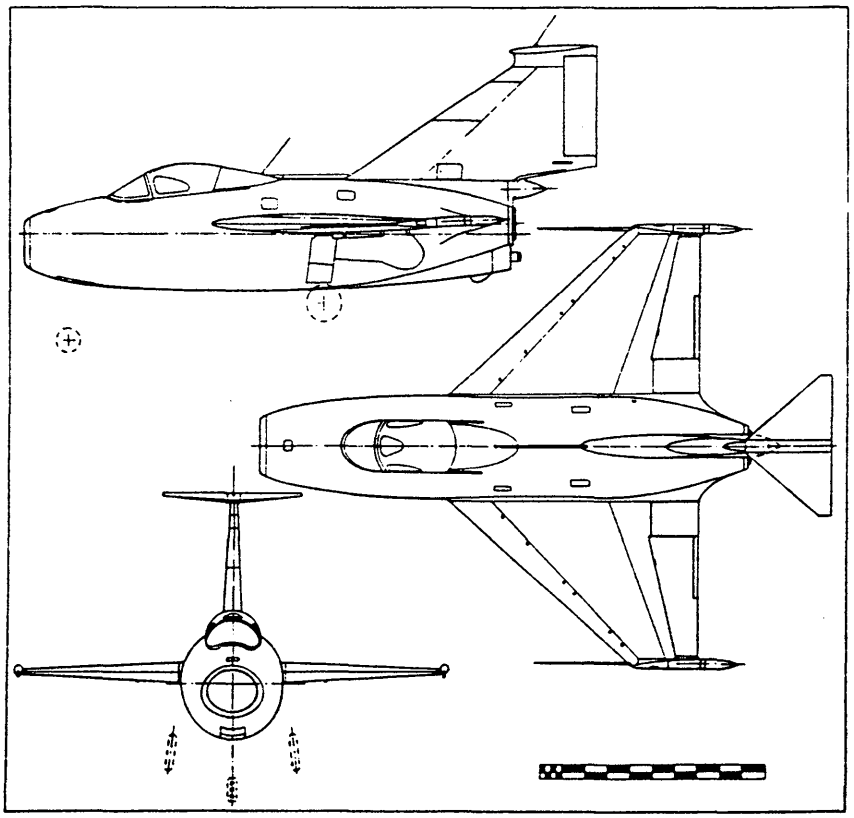


PLAN PAGE ONE
OF TWO







Delta One

DELTA ONE by DAVID ARONSTEIN

PLAN PAGE ONE

OF TWO

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

Indoor Site List

CREDITS: NFFS DIGEST
K. JOHNSON FIRST IN BOEING HAWKS

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

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

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

Addendum

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

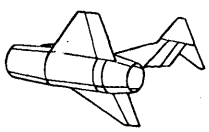
If you have any to add or changes please send to Garry Underwood , 9 Treelawn Terrace, Mercerville NJ 08619 and to INAV. Garry keeps the master list. For the full print out send $3.00 to INAV. Garry does not have time to reproduce and mail the list.

NEW ADDRESS - JIM JONES

Address:

Jim Jones
36631 Ledgestone DR
Clinton TWP MI 48035

Phone: 313-791-0651



SEND NEW ADDRESS TO INAV MOVING ?

SUPER-FINE TISSUE AGAIN AVAILABLE

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

AIKO'S ART MATERIALS IMPORT
3347 NORTH CLARK STREET
CHICAGO IL 60657
Phone 312-404-5600 Closed Sunday and Monday

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

Shipping and Handling $1.75 + UPS. (In USA expect shipping, handling and UPS to run about $4.00 to $5.00)
Payment: Checks (US $ on US bank). NO VISA

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

INDOOR NEWS CONTINUED

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

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

Holland	HFL	20,-
Europe	HFL	30,-
Airmail	USD	20,-

ULTRA FILM CUTTERS

SMALL SCALPELS

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

Vernon D. Hacker, M.D.
25599 Breckenridge Drive
Euclid OH 44117

US $ drawn on US bank or postal money order in $

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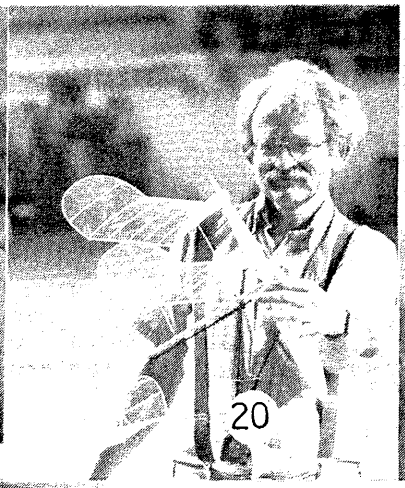
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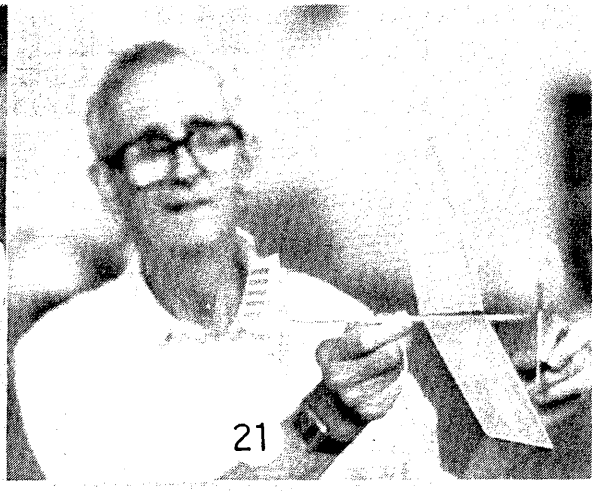
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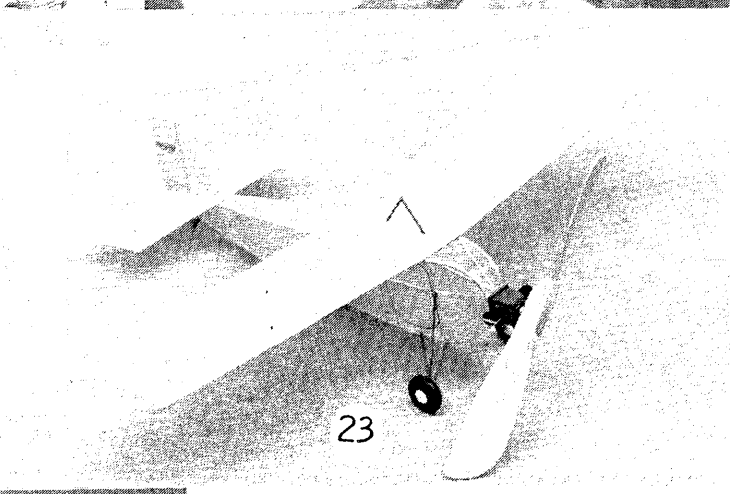
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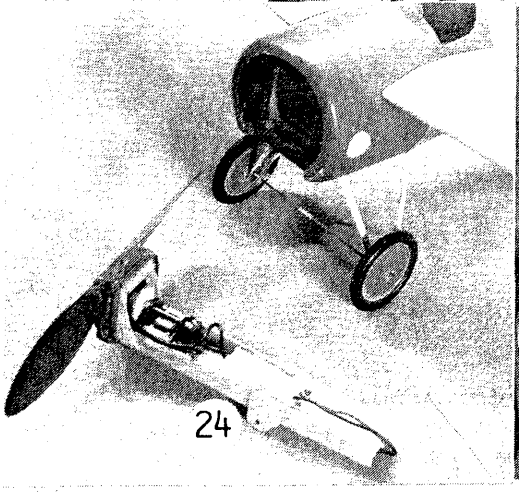
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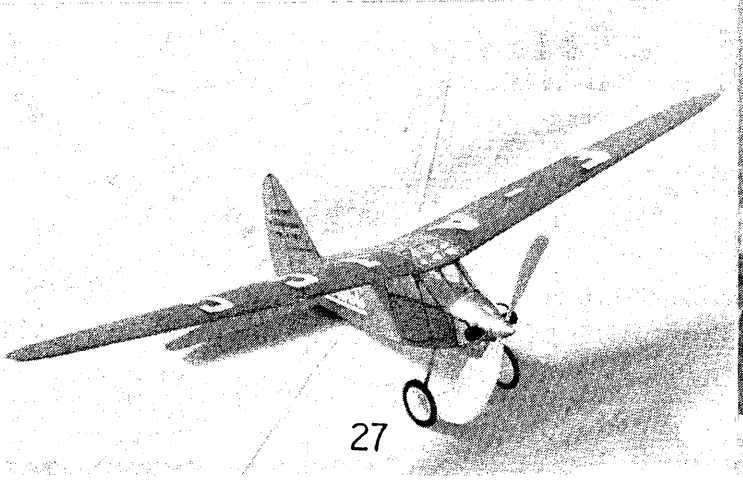
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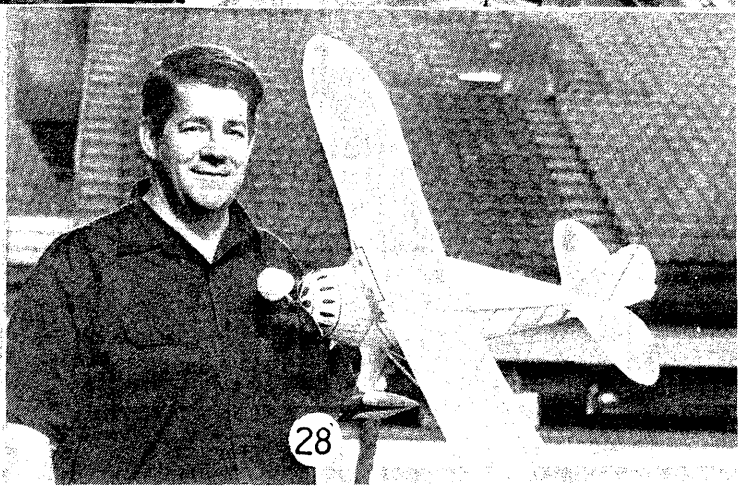
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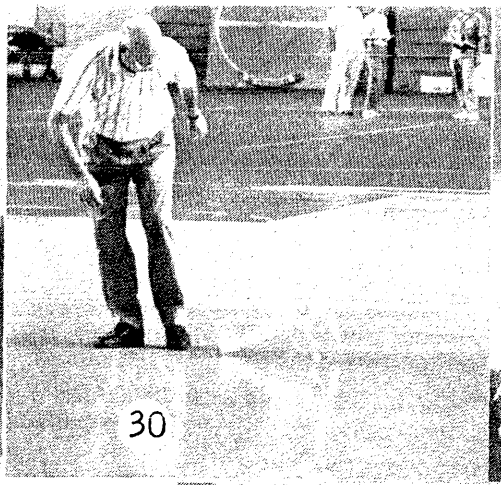
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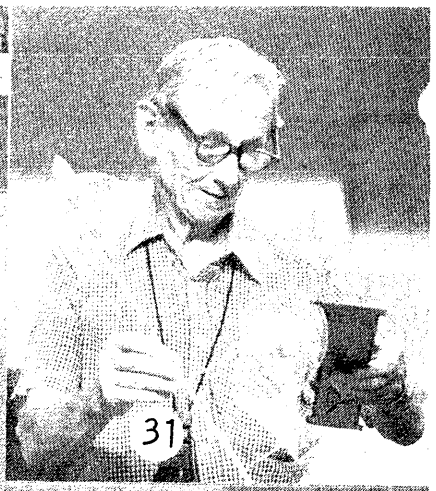
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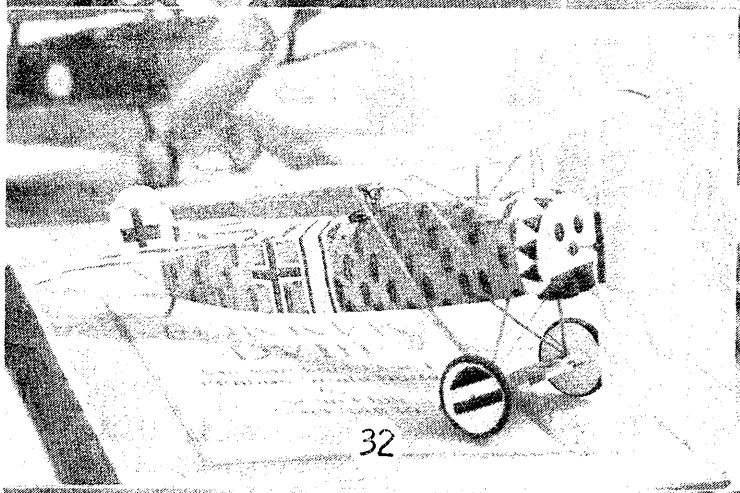
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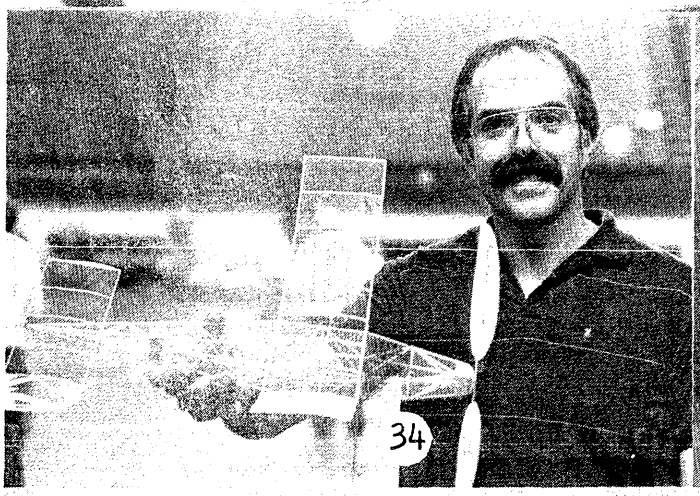
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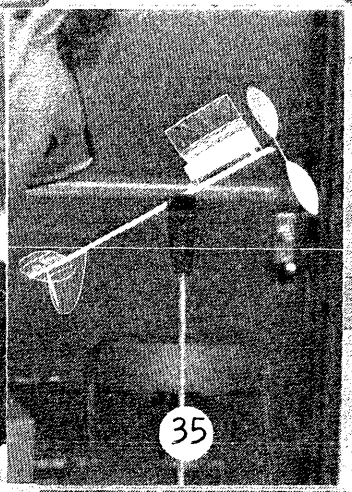
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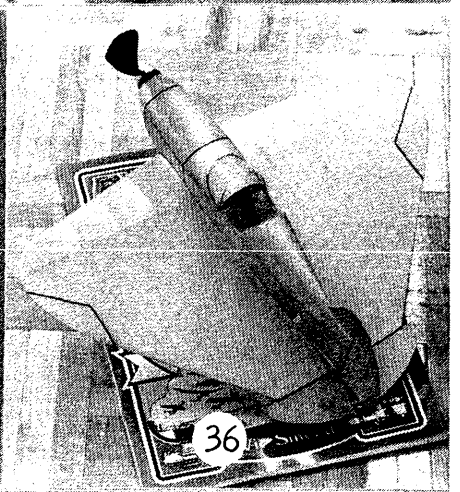
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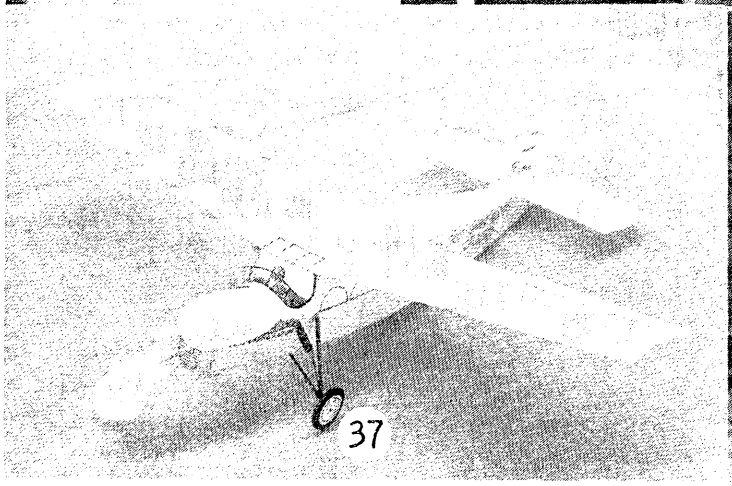
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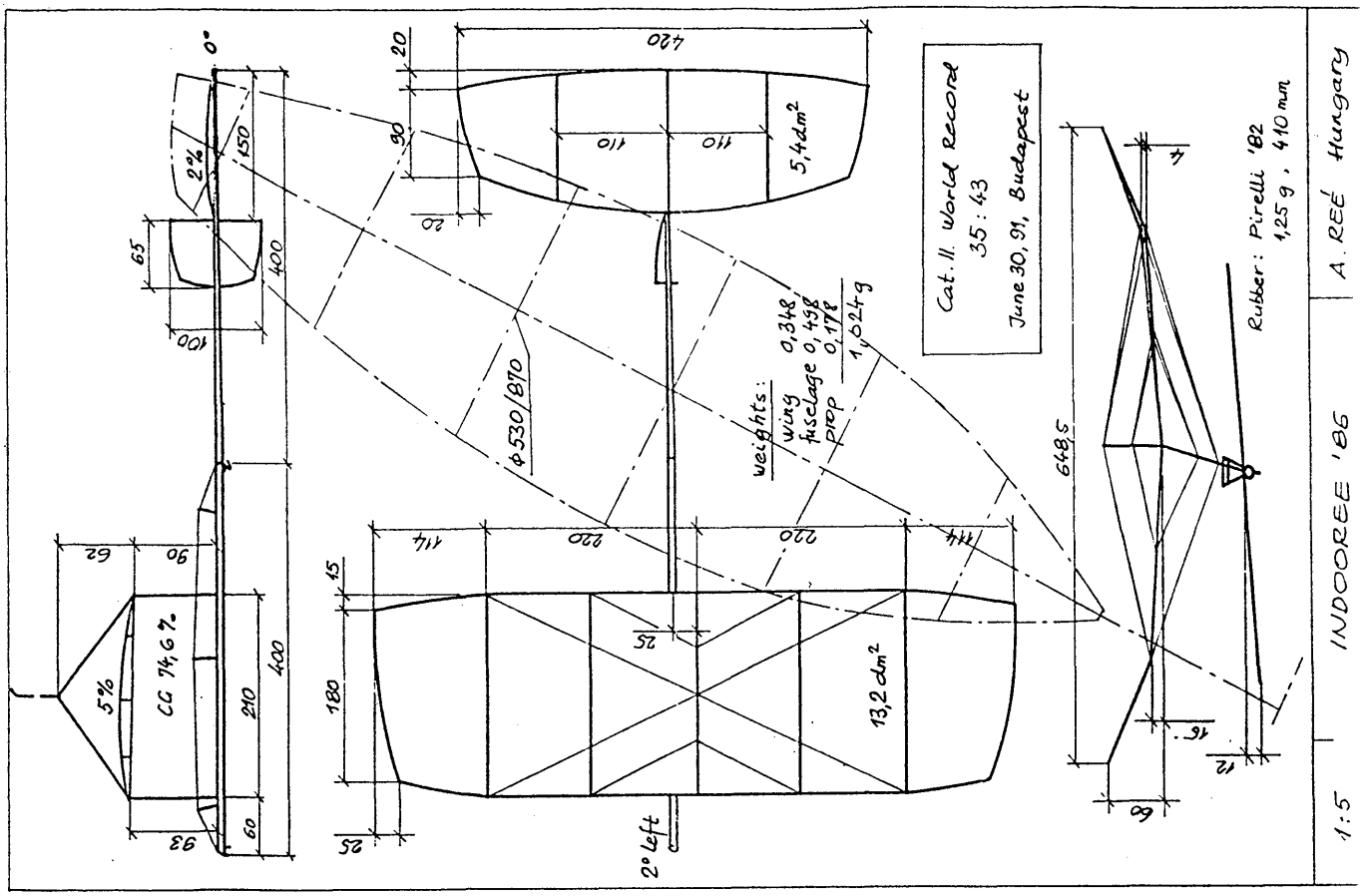


RECORD DESCRIPTION

In the Várszegi Memorial '91 Indoor Competition (organized by the Modelling Club of Technical University Budapest) in my forth official flight 35 minutes 43 seconds was recorded. It was more than 2 % higher than the valid world record figure in Cat.II. record class (32-b). The record has been confirmed by the FAI.

The site of the record flight is the hall of the central "K" building of Technical University Budapest, the place of two previous world records in 1970 (A.Ree) and 1981 (D.Orsovai) in the same record class. The certified official height of the hall is 14.90 meter which equals also the max. height of the site.

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

The motor was made from a batch of pirelli from 1982 (1x4 mm) which we are using in warm air. The motor weighed 1.25 grams, the original length was 410 mm, it was the third flight with this rubber, two of them on the same day. I succeed to wound 1840 turns into the rubber than I launched with 1700 turns. After landing there was 170 turns left, so the average rpm was 42.8.

András REÉ

HARLAN BEARING MODS FOR LARGE SHAFT

Do you get a little nervous when you watch the rubber hook on the prop shaft trying to "go straight"? For this reason some use .020" prop shafts on Penny Plane and Manhattan. The weight is not usually a problem as weight is needed up front anyway. To enlarge the hole take a fine needle of the diameter you want the hole and grind a flat on one side. Be careful to not over heat the needle. Chuck needle in a low speed drill place a drop of oil or alum-a-tap and go to it. If one side of the flat gets dull reverse the rotation and a new cutting surface is exposed. This reamer idea is from Lester Garber. If you use a better method let me know as beating a problem to death with detailed instruction is my idea of fun.

MOVING ? SEND INAV YOUR NEW ADDRESS

SAVE INAV $1.50 AND YOUR EDITOR

A LOT OF TROUBLE.

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

Edited: Any errors are my fault PJB.

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

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

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

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

DAY 1 Sunday June 21

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

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

For the following rubber powered classes there were two main problems. First,the ceiling which either gave you a break or snagged your airplane completely. Second the weather turned quite sour midway through the contest creating quite a bit of turbulence at the floor. By 11 am the air was beginning to cook in the hangar with minimal drift. Limited Pennyplane was flown between 11 am ar 3 pm.

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

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

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

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

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

DAY 2 Monday June 22nd

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

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

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

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

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

DAY 3 Tuesday 23rd

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

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

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

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

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

OPEN

INTERMEDIATE STICK

1	G. Underwood	21:29
2	T Iacobellis	20:01
3	Dan Belleff	19:29
4	Joe Krush	17:32
5	Tom Vallee	15:03
6	James Grant	13:59
	Doug Barber	DNF
	John Chizamadia	DNF

JR. INTERMED. STICK

1	Chris Sydor	11:16

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

BOSTONIAN

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

MINISTICK

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

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

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

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

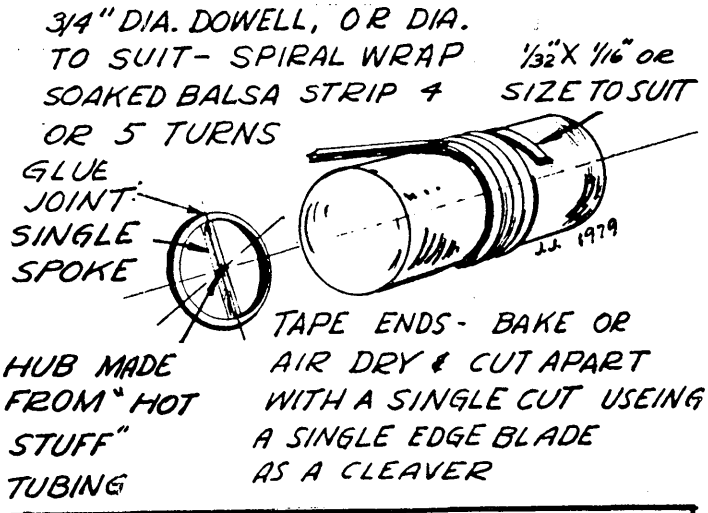
The AMA placed a tremendous amount of trust in us. Rather than trying to run the events for us they played the roll of a supporting team. Every suggestion and request we made was 100 % filled. This included set up logistics (described in the beginning) to the acquisition of additional helium and printing of Award Certificates for our unofficial events. Sandy Frank and Chip Smith came through for us every time we called.

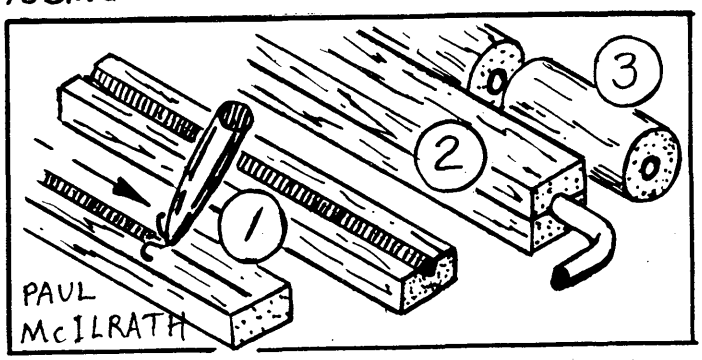
AMA was willing to foot the bill for one of the greatest Indoor Free Flight contests in recent years. We owe AMA great thanks for the efforts they extended.

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

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

R. O. G. WHEELS - JIM JONES





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

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

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

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

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

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

Jack Textor

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

How do YOU get the word out?

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

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

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

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

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

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

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

INAV JULY '92 ADDENDUM # 59, 60, 61

for U.S.A. ~~Canada and Mexico~~ readers only. As this issue is just under two oz. sending this overseas would brake the INAV budget.

The July issue of Indoor News and Views is now at the printer. There are a few things that did not get in for reason of running out of space or losing the material in the stacks of stuff that grow from every table and the floor at paste up time. Lost were the results of the FLYING ACES CLUB section of the U.S.I.C. '92. They were supplied by James Miller who did service as the scale judge for many of the U.S.I.C. scale events. Found them about six hours after the paste up went to the printer.

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

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

FRANK HAYNES

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

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

HiLine Electric Motors ~~has~~ is now part of Rees Industries, P.O.Box 11558, Goldsboro, NC 27532 Phone 919-778-6653

LAKEHURST INFORMATION →

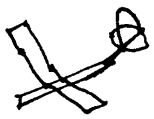
FAC Results at the 1992 U.S.I.C.

Biplane		Scale	Fly	Total
D. Slusarczyk	Voisin	53½	82½	136
Doc Martin	Astra	45	67	112
George Nunez	Hanriot HD-1	52	53	105
Jim Miller	1½ bis	53	45	98
Stan Fink	Fuler D-2	51½	42	93
John Blair	DH-6	51½	41	92½
Wayne Trivin	1½ bis			DNF
Millard Wells	Rose Parakeet			DNF
	Waco Cabin			DNF
Mason Plank	Waco SRE			DNF

Hi-Wing Monoplane				
Michael Thompson	Lacey	50½	82½	133
Jim Miller	Lacey	53½	77	131
D. Slusarczyk	FRED	56	71	127
Dave Rees	Cougar	62½	63	126
Joseph Coles	Air Camper	54	71	125
Stan Fink	Vagabond	52	73	125
Geo. Nunez	Beaver	53½	65	118
Millard Wells	Cessna R-6	50½	66	116
John Blair	Elias	52	62	114
John Martin	Puss Moth	49½	64	113½
John Martin	J-3 Cub	46½	57	103½
Carl Hedley	LASA 60	50½	66	116½

Golden Age (1920-1940)		Total 3 flites
Stu Weckerly	Stout 2AT	5:47
J. Kortenbach	Goon	5:28
John Blair	Cessna C-34	4:58
Jim Miller	P.A.M.A.	3:47
Millard Wells	Huntington	3:13
Dave Linstrum	Goon	3:00
Geo. Nunez	Blackburn Bluebird	2:17
John Martin	WACO on floats	:55

WWI Combat	
Larry Loucka	DH-6
J. Kortenbach	?
Millard Wells	?
Stan Fink	
Jim Miller	
Stu Weckerly	
Geo. Nunez	



CD: WALT ERBACH ----1

LIMITED PENNYPLANE -JR-

		BEST FLIGHT
1 Erick Sears	(JR)	09:11
2 Chris Sydor	(JR)	08:14
3 Kris Forward	(JR)	04:31

USIC 1992

CD: WALT ERBACH --------19

LIMITED PENNYPLANE - SR-

		BEST FLIGHT
1 Peter Kearney	(SR)	11:58
2 Benjamin Knight	(SR)	00:00

OTHER OPEN FLYERS NOT LISTED IN INAV

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

16TH WORLD CHAMPS WROCKAW POLAND '92

WORLD CHAMPIONSHIP 1992

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

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

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

FAI WORLD RECORD CAT TWO
or Bob Randolph does it again

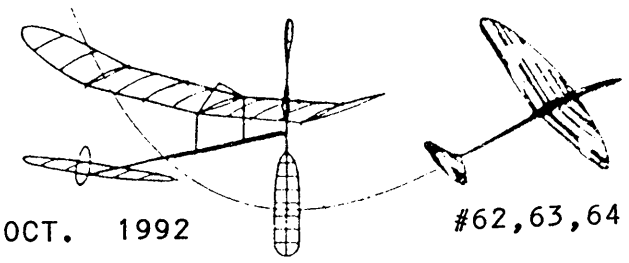
Andy Tagliafico set up a record trial in Seattle prior to the July meet at the Kibby Dome. Site was a Navy Reserve Training Center with offices in use around the perimeter during the trial. Needless to say not all doors remained closed during the flights. The new record set by Bob is 37 min. and 12 sec.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

MINI-STICK AKA Living Room Stick

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

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

INDOOR NEWS and VIEWS



OCT. 1992 #62,63,64

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

FRANK B. KIESER
1921 - 1992

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

Two well known East Coast modelers have recently passed on.

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

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

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

ASK ASK ASK

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

ASK ASK ASK

MYSTERY MAN IDENTIFIED

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

NFFS NEWS

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

CHECK YOUR ADDRESS LABEL
62,63 & 64 EXPIRE THIS ISSUE
#65, 66 & 67 EXPIRE NEXT ISSUE

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THIS ISSUE

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

THANKS TO

CHUCK SLUSARCZYK for doing a great job as contest director of USIC '92. Look at the contest results in the July issue heading each list is the name of the CD for each event. Chuck and those people are the ones who DID IT for the rest of us.

JIM MILLER did USIC scale judging and sent the FAC and some other results to me.

KEN JOHNSON supplied INAV with a wax machine for doing the paste up. It was used for the July issue and made the job go a lot better. INAV now owns a wax machine and easy to use software to manage the mailing list.

STORM ANDREW REPORT

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

MOVING ? SEND INAV NEW ADDRESS

RUBBER TEST IN ST. LOUIS

From Thermaleers Newsletter Bob Klipp, editor.

By Howard Henderson, assisted by Larry Coslick

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

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

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

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

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

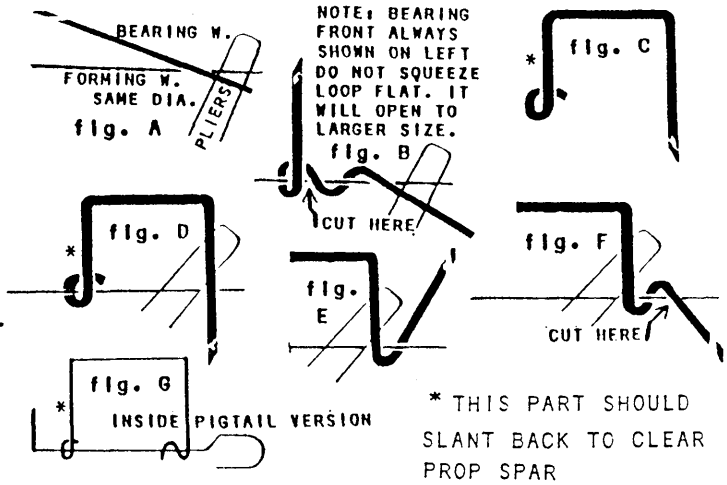
Several motors were wound a second time and we obtained the usual increase in EEq of about 15%. This was true of all lubrication systems.

FORMING WIRE NOSE BEARINGS FOR INDOOR MODELS

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

Assuming a prop shaft dia of .020" or slightly smaller use two pieces of .020" music wire. One, about 2" long as the forming wire, the other from which the bearing is to be formed should be 12" to 15" long. Needed tools are a pair of needle nose pliers and a pair of wire cutters. First, place the forming wire under the 12" bearing wire as in fig. A and grab with the needle nose pliers held in the right hand. Start bending the bearing wire around the forming wire with the left hand. At first it will pigtail but as soon as possible wind at least one full turn perpendicular to the forming wire to make the nose loop. Make sure it is a full closed loop. Do not squeeze but make sure the loop is not more than one loop thick otherwise you will not be able to insert the prop shaft's hook. Cut bearing wire at the loop as in fig. B. Bend the body of the bearing into the shape in fig. C. Put the forming wire through the loop and under the extended end of the bearing wire and grab the two wires with the needle nose pliers as in fig. D. Using the right hand twist the long bearing wire under and around over the top as in fig. E. Finish and cut off the pigtail as in fig. F, leave only enough to hold the prop shaft. A long pigtail may impede passage of the prop shaft hook. To cut bearing length put the pigtail inside as in fig. G. Try this after mastering the outside pigtail. All of this will take practice, the first 8 to 10 may not meet your standards. Note that .015" wire is easier to use than .020" wire.

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



INAV #62,63,64

FULL SIZE

AN INAV PLAN

SCROD

NO SPAR

DIHEDRAL BREAK

OCT. 1992

OPTIONAL LETTERS

PICK IS POPULAR BOSTON SEAFOOD.

YUMMY IN YER TUMMY!

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

ASSURE TIPLETS DO NOT EXTEND BEYOND 16" PROJECTED SPAN!

VERTICAL TIPLET

TIPLET SHAPE 1/100 SH

1/2" TIP DIHEDRAL

DIHEDRAL BREAK

WING LE

TE

MAKE REAR POST REMOVEABLE WIND MOTOR FROM FRONT

1/16 ALUM TUBE REMOVEABLE

OPEN

OPEN

1/20

REAR POST PERCAL

NOSE BLOCK

TEFLON TUBE

3 LAMS 1/32 CROSS GRAIN

1/20 SH

ULTRA-FILM WINDSHIELD

ADJUST TURN WITH RIGHT TURRET

© 199

BY

DAVE

'TO'

LINSTRU

TE 1/16 x 1/32 — 1/32 □

1/2 STAB (MAKE TWO) NO RIBS

3/4 x 1/16 FOAM WHEELS TEFLON TUBE HUB

MOVING ? SEND NEW ADDRESS TO INAV

1/16 x 1/32

SIDE - B BODY

LE SAME AS TE

3 LAMS 1/32

MAY TOED IN + RT THRUST

1/20 SH

OPTIONAL "FISH FACE" AND FINS

WINDSHIELD TOP

"SIDE" WINDOWS! ULTRA-FILM

WING ON TOP OF LONGERO

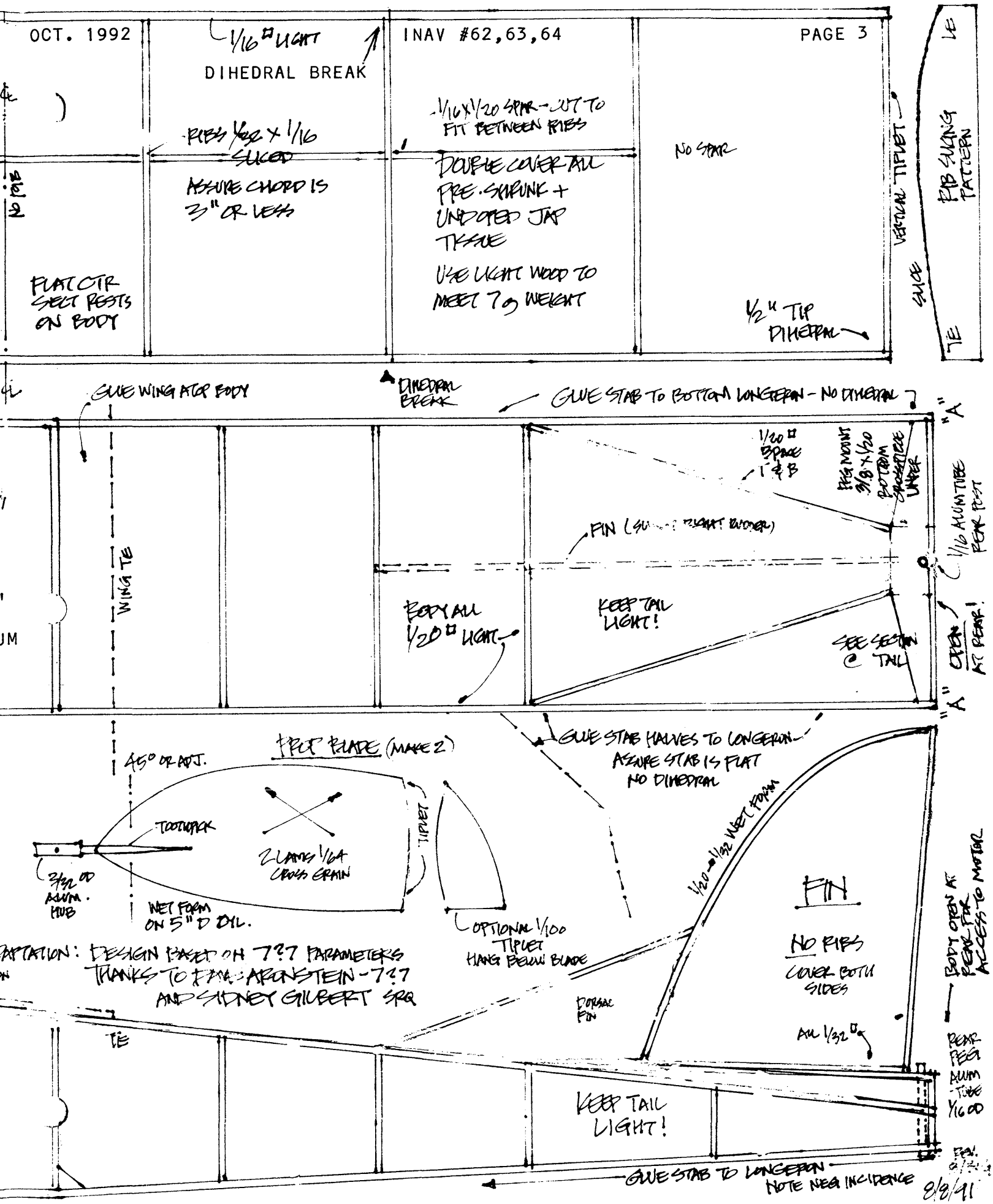
AD

ALL 1/32 □

PROP 6" DIA SEE DETAIL 1/32 SH BLADES (2 LAMS 1/64) TOOTHPICK HUB IN ALUM TUBE

.015 GEAR FOAM WHEELS 3/4" DIA

3 x 1.5



Boston SCROD 7g Bostonian VTO

WINDING STOOGE TIPS - Dick Hawes

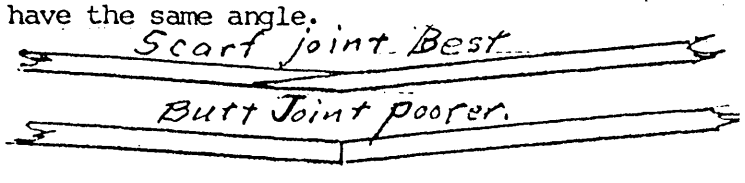
NO-CAL AERONCA CHAMP

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

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

A thin wire on the rear of the motor stick ngages a hole in a small aluminum tab on the rear of the fuselage to maintain motor stick alignment without twisting the fuselage. The front of the motor stick has a thin wire (.Ø15") bound to it which inserts in an aluminum, or plastic tube in the sheet balsa front end of the fuse. A couple of 1/16" standoffs keep the stick far enough from the fuse to permit room for the rubber knots. A bent pin through another tube in the fuselage serves as a lock to hold the stick in place. Everything else is conventional No-Cal.

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



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

The tips are made by soaking strips of 1/32"X1/16" balsa in hot water for about 20 minutes, then securing them to a cardboard, foam or balsa form shaped to the inside dimension of the tip. Wax the form so the tip doesn't stick, using a candle or crayon. If using a crayon, make sure it is the same color as the airplane because it comes off on the wood. Use two strips, longer than you need, with white glue, like Elmer's, between them. Tape one end of the stack to the form and PULL the two strips around tightly to the form and tape it to the other end. It helps to leave some extra space at the end of the form to have something to tape to. Let them dry in the air overnite or give them about a minute in the microwave or a half an hour at lowest heat in the oven. When dry, cut another scarf joint to fit the leading and trailing edges and glue in place with the tip raised to meet the spar and glue there, too. This is best done with the wing panel pinned down again.

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

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

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

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

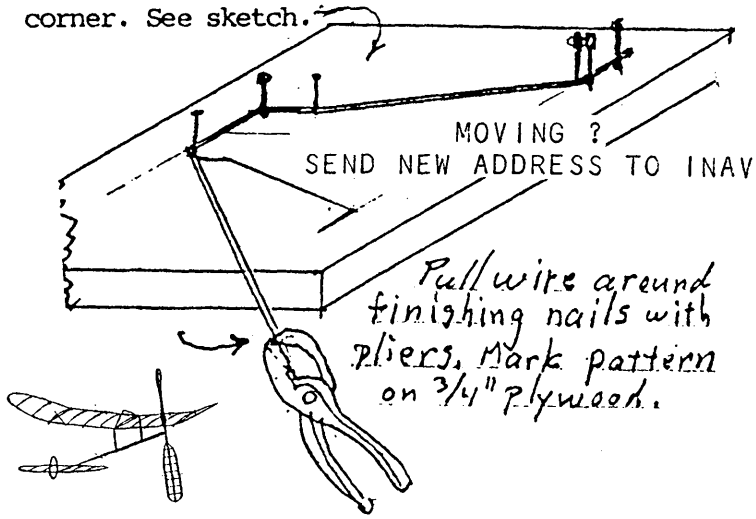
I fly mine on a 15" loop of 1/16" sq. FAI grey rubber. I use some down and left thrust bent into the brass bearing mount. It flies in left circles at a very realistic speed and attitude. Best time so far is about a minute and fortyfive seconds under a forty foot ceiling. It wont beat a No-Cal Fike, but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

MORE TIPS

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

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

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



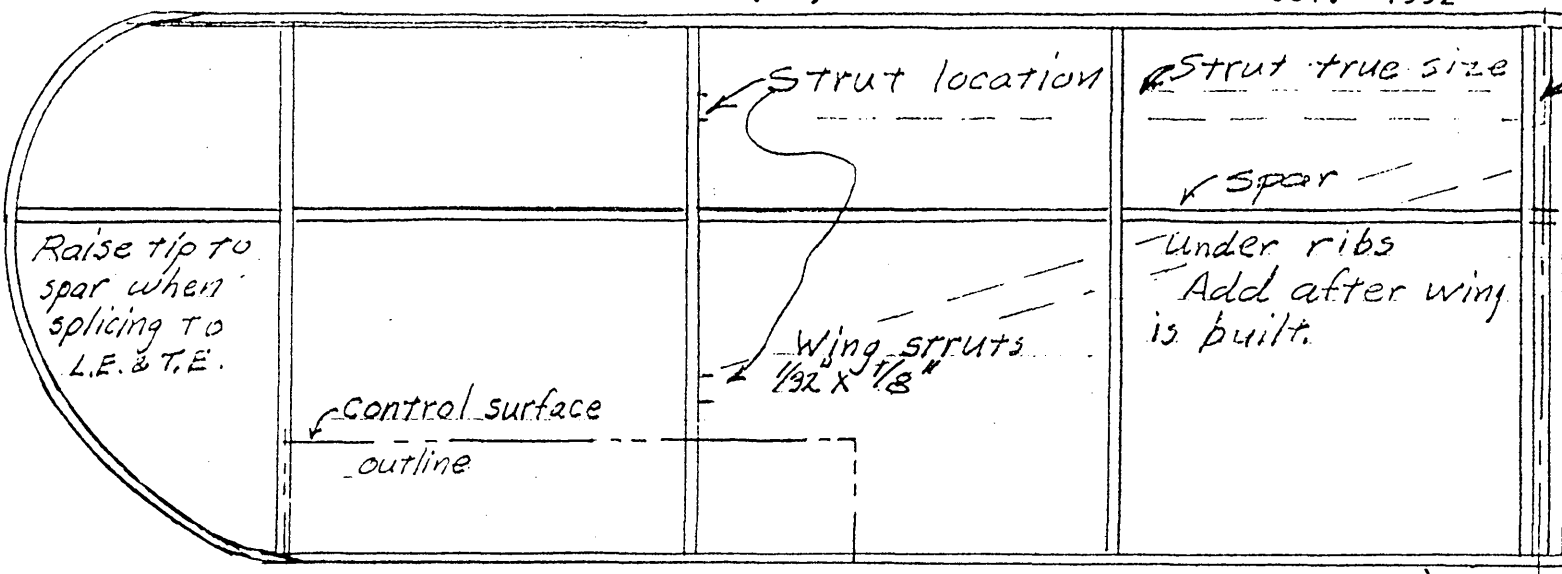
Another plug for a product. The plastic cutting boards are great! No grain to cause your razor blade or Exacto knife to go off course. No left over cuts from previous jobs to cause the same thing. I'm not sure what kind of plastic they are but I 'm guessing it's polyethylene. The cuts and slices you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

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

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

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

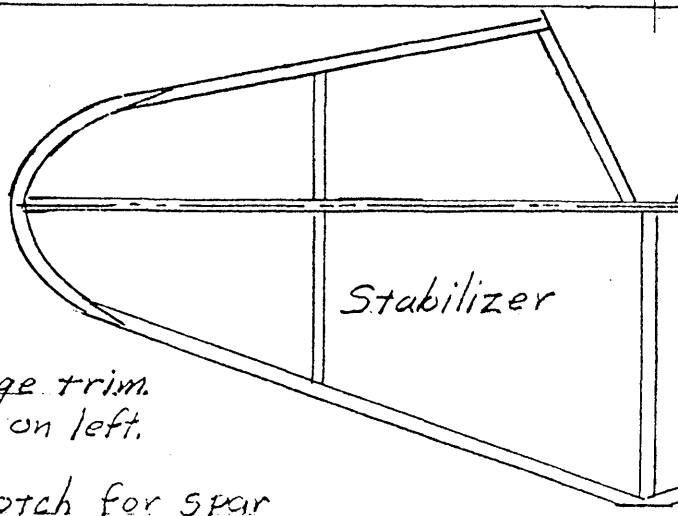
THE WINDING STOOGE is the voice of the Nebraska Free Flighters.
Subscription $10.00 US for the USA
Dick Hawes
Treasurer
9220 N 52 AVE
OMAHA NE 68152

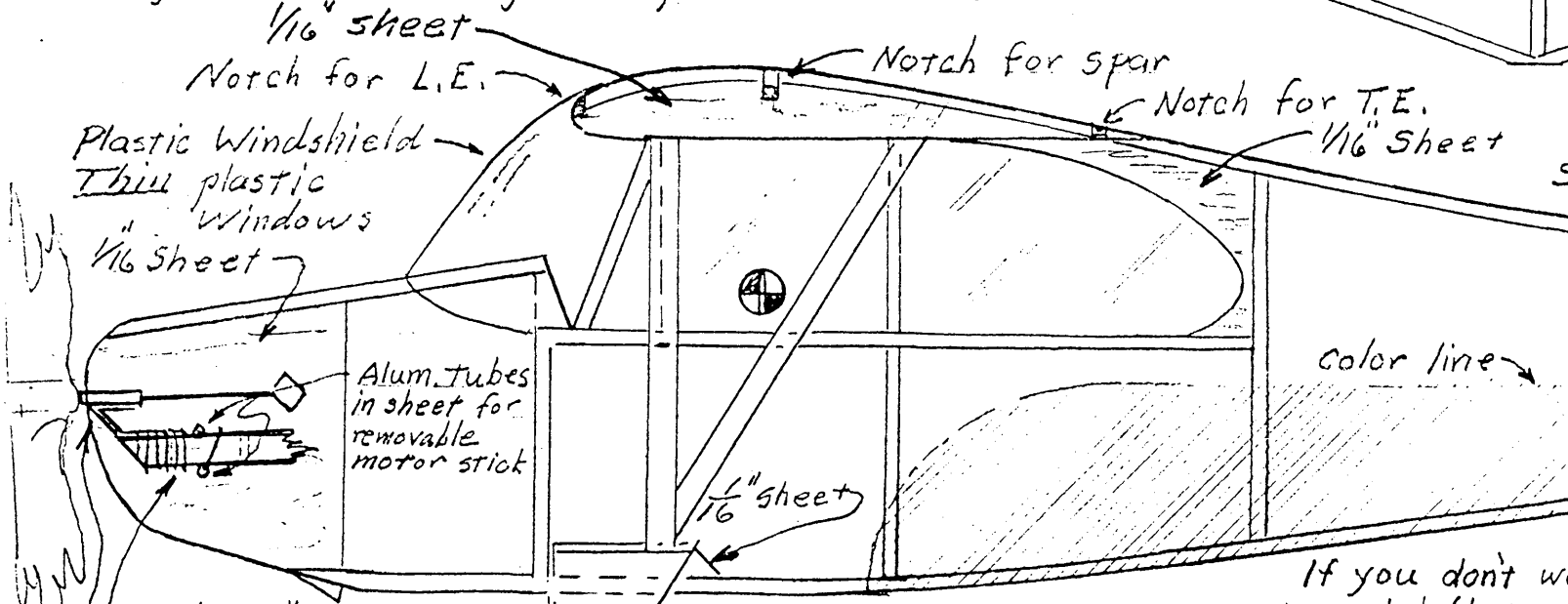


Rib Template

Basic structure is 1/16" square

Ribs are sliced from 1/16" sheet.
Tips are laminated from 2 strips of 1/32 x 1/16 formed around cardboard or foam form, waxed with candle or crayon.
Color is creamy yellow with internat'l orange trim.
Original covered on right side, motor stick on left.





3/32" x 3/16" Motor Stick
1/16" O.D. Brass Tube Brg.
Solder to .025" x 3/32" brass strip. Glue & wrap.
Original used 6"
North Pacific Prop

.020" M.W. Ldg. Gear
Paper Fairing
Meat tray foam or 1/16" Balsa Wheels with 1/8" dowel hubs.
See "Modeling Tips" this issue.
Use Aluminum duct tape for hub caps.

If you don't w
motor stick (but you
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fuselage on 1/16 sta

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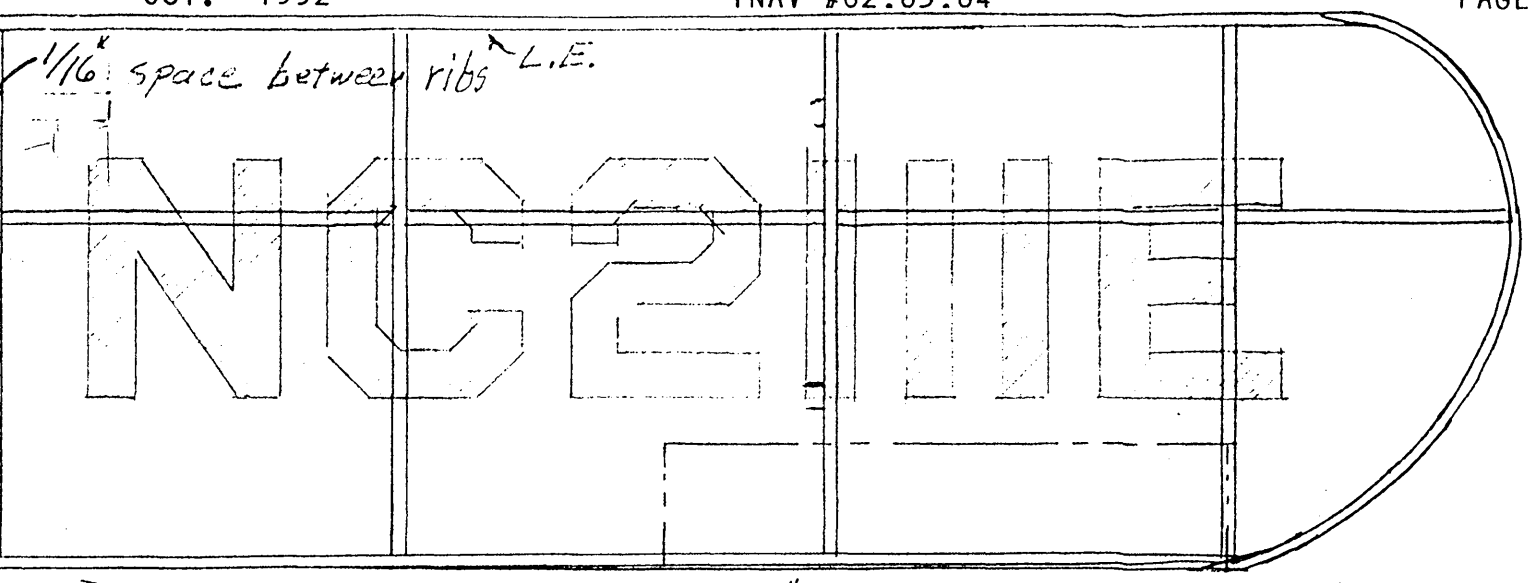
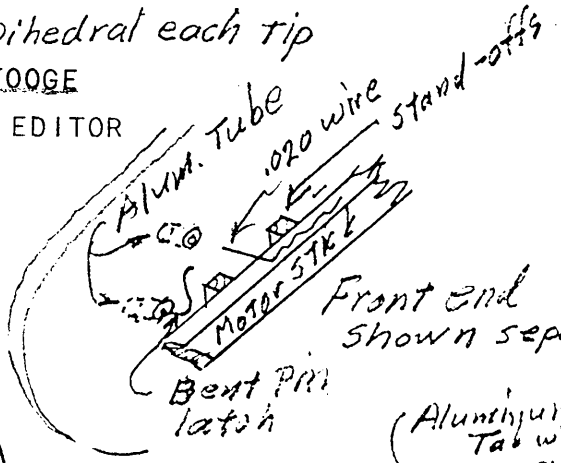
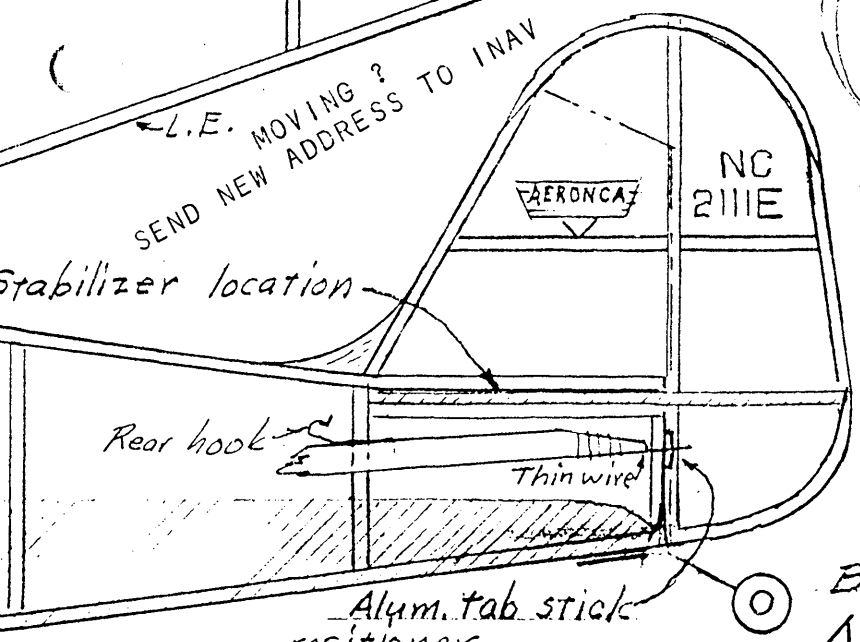
FROM:
THE WINDING STOOGE - TOM WINTER, EDITOR



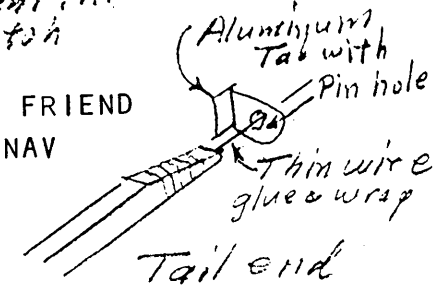
1/2" Dihedral each tip

FROM:
THE WINDING STOOGE
TOM WINTER. EDITOR





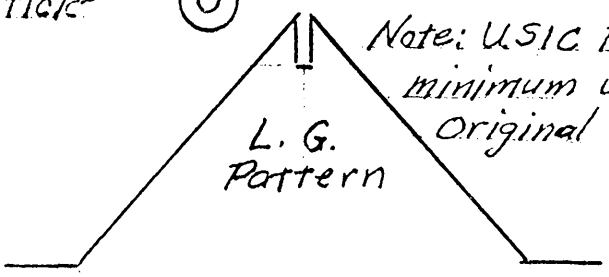
SIGN-UP A FRIEND
IMPROVE INAV



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

Best time to date: 1:43.4

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



ant a removable
should), just glue it
. Stick stands off from
nd-offs.

use 1/16" sq. rubber
@ (" long.

OT water shrink
e the tissue!

Aeronca 7AC Champion
No-Cal Scale
Designed by: R. Danford Hawes, P.E.
Drawn by: R.D. Hawes; Checked by: R.D.H. 4-17-92

THE CORKSCREW VI HELICOPTER
By Tom Vallee

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

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

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

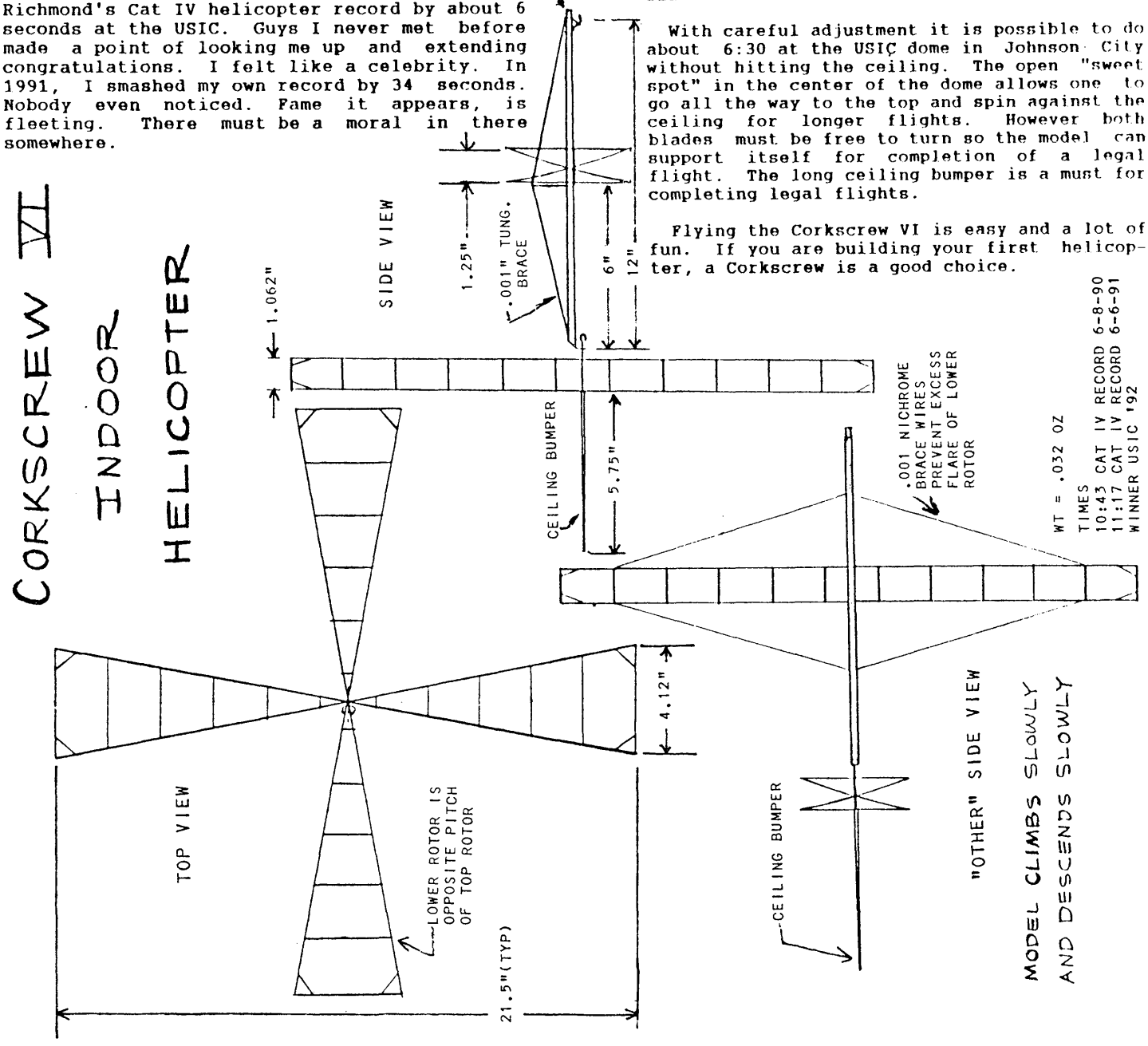
The national records were a humbling experience. In 1990, Corkscrew VI broke big Jim Richmond's Cat IV helicopter record by about 6 seconds at the USIC. Guys I never met before made a point of looking me up and extending congratulations. I felt like a celebrity. In 1991, I smashed my own record by 34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

Building a Corkscrew is simple. Motor stick construction uses exactly the same techniques one would use for making a motor stick for F1d or Intermediate Stick. The airfoil is a simple arc with about .100 inch camber at the middle of the longest (tip) rib. I use a simple jig for building the rotors. However, strictly speaking, a complete jig is not absolutely necessary. It is possible to draw an "elongated X" on your building board and using simple balsa triangles to align tips and center, build the rotors right on the board.

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

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

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



WINDER EXTENDER TORQUE METER

From: National Free Flight Society Digest
By Don J Lindley

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

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

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

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

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

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

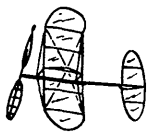
PARAMETERS OF ONE LOOP OF VARIOUS WIDTHS OF RUBBER

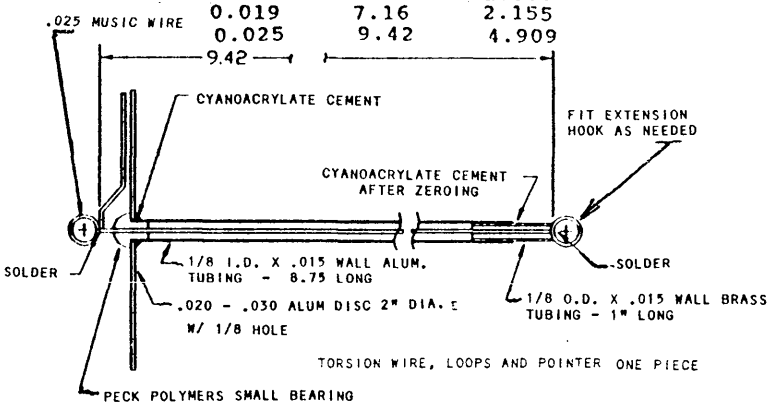
RUBBER WIDTH, in.	LOOP WEIGHT gm./in., approx.	LOOP WEIGHT oz./in. approx.	MAX TURNS per in., approx.	MAX TORQUE in.-oz., approx.
0.020	0.026	0.00092	210.0	0.150
0.030	0.039	0.00138	171.5	0.276
0.040	0.052	0.00184	148.5	0.424
0.050	0.065	0.00230	132.8	0.593
0.060	0.078	0.00276	121.2	0.779
0.070	0.091	0.00322	112.2	0.982
0.080	0.104	0.00368	105.0	1.200
0.090	0.117	0.00414	99.0	1.432
0.100	0.130	0.00460	93.9	1.677
0.110	0.143	0.00506	89.5	1.935
0.120	0.157	0.00552	85.7	2.205
0.130	0.170	0.00598	82.4	2.468
0.140	0.183	0.00644	79.4	2.778
0.150	0.196	0.00690	76.7	3.081
0.160	0.209	0.00736	74.2	3.394
0.170	0.222	0.00782	72.0	3.717
0.180	0.235	0.00828	70.0	4.050
0.190	0.248	0.00874	68.1	4.392
0.200	0.261	0.00920	66.4	4.743

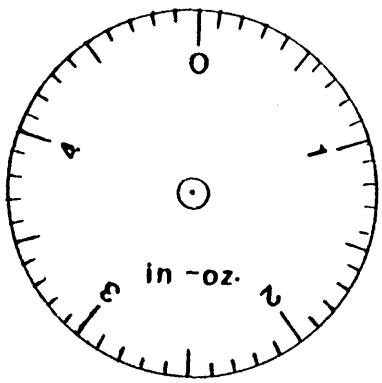
TORQUE METER WIRE PARAMETERS
assumes 100,000 psi yield in torsion

Data from C. Sotich, 1972

WIRE DIAMETER in.	WIRE LENGTH in.	TORQUE AT 360 deg. in./oz.
0.031	11.69	9.359
0.005	1.88	0.039
0.007	2.64	0.108
0.009	3.39	0.229
0.011	4.15	0.418
0.013	4.90	0.690
0.015	5.65	1.060
0.019	7.16	2.155
0.025	9.42	4.909







MOVING ?
SEND INAV YOUR
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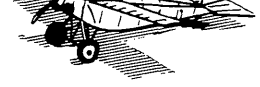
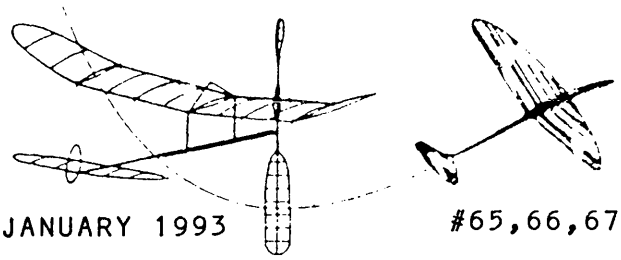


Ed. note: You may wish to calibrate your meter after assembly. All that is needed are masses of known value. Two points are all that are needed to lay out the full scale but by using three or more you have a check on your work. You should find that Young was right.

INDOOR
NEWS and VIEWS



JANUARY 1993 #65,66,67

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

GARBER SELECTED NEW INAV EDITOR

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

USIC SAVED BY TOM IACOBELLIS

N.Y. MODELER NATIONAL HERO

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

IACOBELLIS NEEDS PART TIME HELP

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

Contact: Tom Iacobellis
198 Manhattan AVE
Hawthorne NY 10532

Phone: 914-747-9038

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

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

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

NEW SUBSCRIPTION RATES

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

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

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

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

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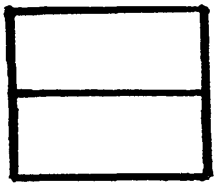

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EXPIRES NEXT ISSUE

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

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

Edward M Sullivan
19 Frederick DR
Newport News VA 23601

Rates: $15.00 one year or $ 27.00 two years

THE JOY OF FLYING FREE

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

Tony Italiano
1655 Revere DR
Brookfield WI 53005

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

MOVING ? SEND INAV NEW ADDRESS

HOW TO "HANDLE" ULTRAFILM COVERING JOBS

LARRY D.COSLICK

First published in The Turbulator of St. Louis MO.

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

MAKING THE HANDLE

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

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

PREPARING THE FILM

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

SPRAYING WITH THE 3 M 77 TYPE ADHESIVE

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

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

PLACING THE SPRAYED OUTLINE ON THE FRAME

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

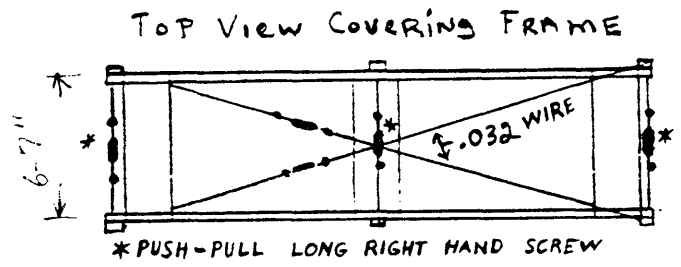
FINAL OPERATION

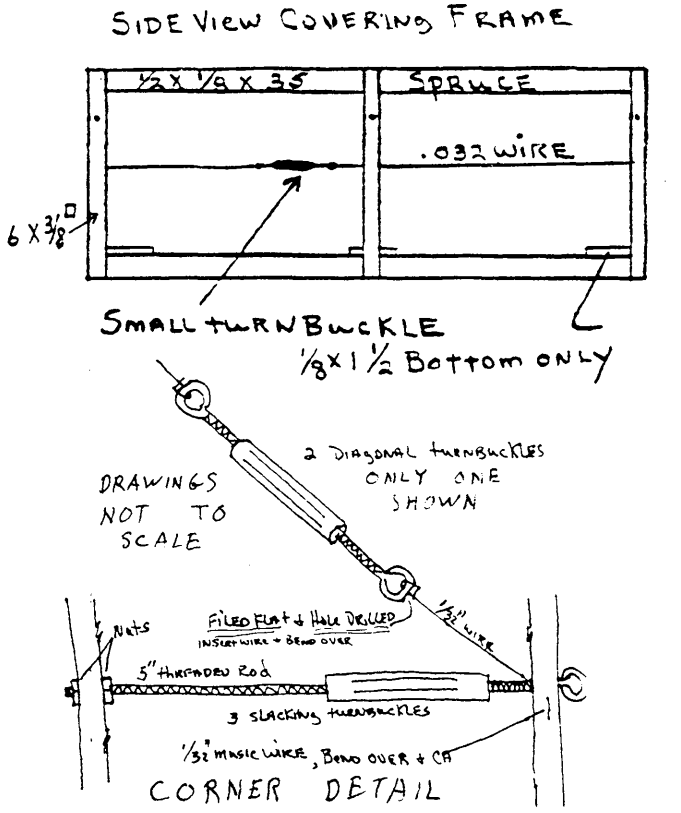
Remove the handle be using an artist's brush and wetting each finger where it attaches to the outline. Wait 5 minutes for the glue to soften. Several applications of water may be necessary. Gently raise and lower the handle until it separates from the outline. Wait an additional 5 minutes for everything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

REMOVING SLACK IN THE FILM

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

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





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THE F1D CHALLENGE

Lt. Col. Bob Randolph

Introduction

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

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

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

Building an F1D model isn't easy but it is not as difficult as many modelers seem to think. My daughter, Linda, built some pretty good F1D's when she was a junior. I recall I used to tease her that I could teach a baboon how to build indoor. The point is your first F1d won't be the greatest but with determination and effort, each F1D will be better. It took me 15 years to win my first US Team slot. For those modelers that aren't interested in competition, your first F1D will fly better than anything you have ever built. Please humor this old timer (69 years young) and give F1D a try. My next article will suggest how to get started.

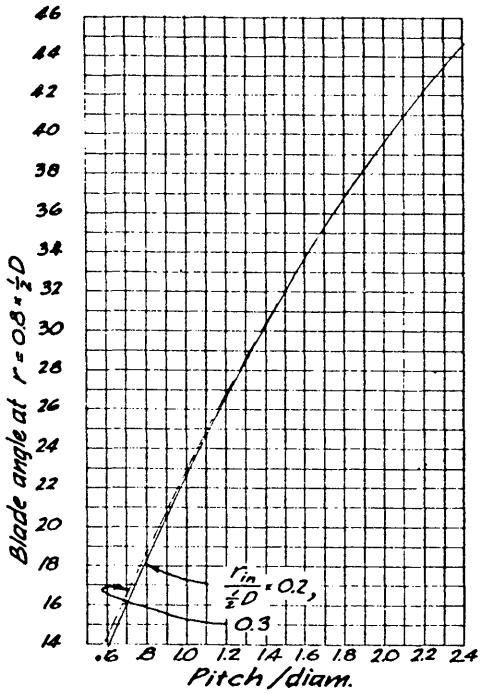

Figure 4: Blade Angle at 80% Radius

APPENDIX

NOMENCLATURE

P	prop pitch
D	prop diameter
α	prop blade angle
c	prop blade chord
h	camber height
L	blade length
R	"cam" radius
r	dist. from propshaft to any point on blade
s	twist rate of blade
ϕ	helix angle; the angle at which the prop blank is wrapped around the can.
H	blade arch height, see figure in appendix
P/D	pitch-diameter ratio
h/c	camber ratio
c/D	chord-diameter ratio
2R/D	ratio of can diameter to prop diameter
F	(h/c)/(c/D)
S ½sD	½sD = twist parameter; total twist for a blade that extends to the propshaft.
H/D	blade arch parameter; a measure of the grotesqueness of the prop.

****

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Bill Warner has used one and thinks it is great. He may feature it in one of his Model Aviation columns. If it is his next one you will need to be quick to avoid the rush as some of "the others" read MA. When 13 years old I would have sold my dog and cat for a Beacon Electronics Good Brothers radio. With one of them ($69.95) and $1,000.00 worth of batteries you could have your gas model return almost to your feet. At least E. Paul Johnson a second place winner at the NATS did it that way. Well my dog and cat together would not bring a dollar and $69.95 was like reaching for the moon but now I have the finest product of Harry G Geyers hand and mind. That is correct Harry was Beacon Electronics.

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

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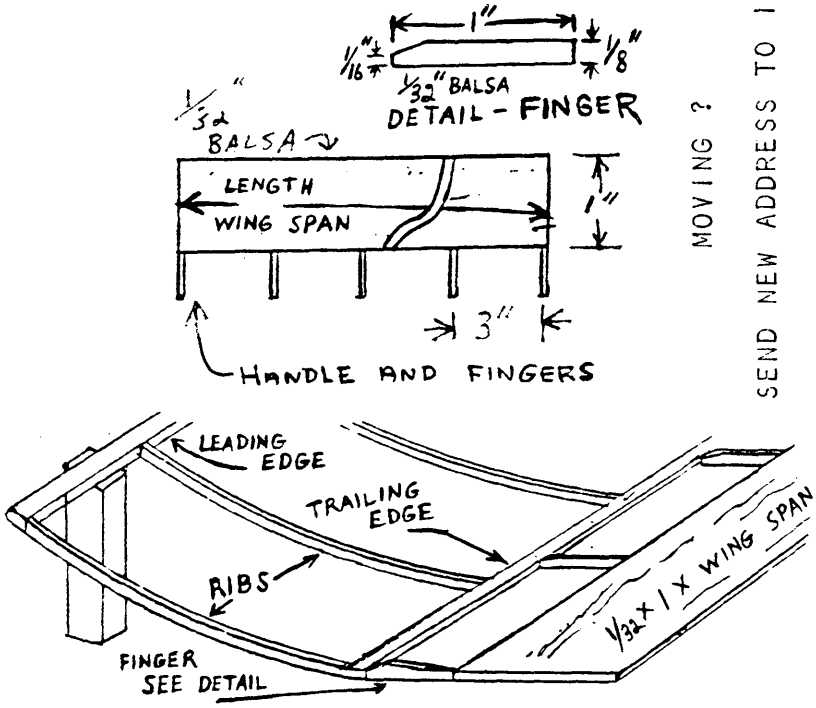

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CLEAN MOTOR STICK REPAIR

TOM VALLEE

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

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

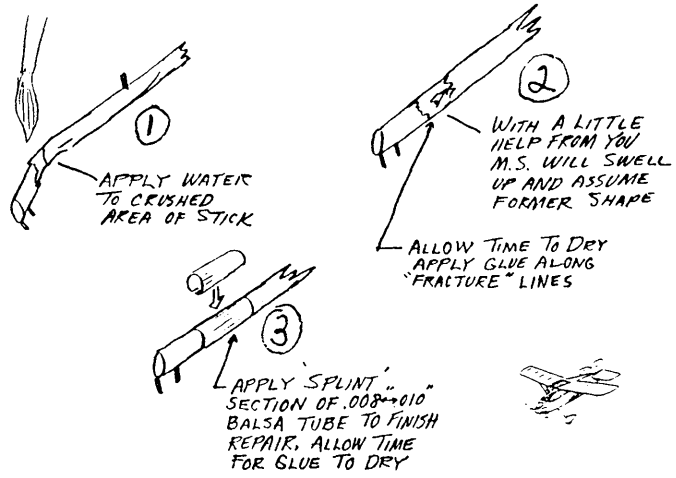
My system is as follows. First to be prepared for such an emergency, I always carry a small plastic box containing short sections of balsa tube about the same diameter as a typical motor stick. Use thin motor stick stock or better yet, make the tubes from tail boom stock.

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

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

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

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



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as done by FRITZ MUELLER

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

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

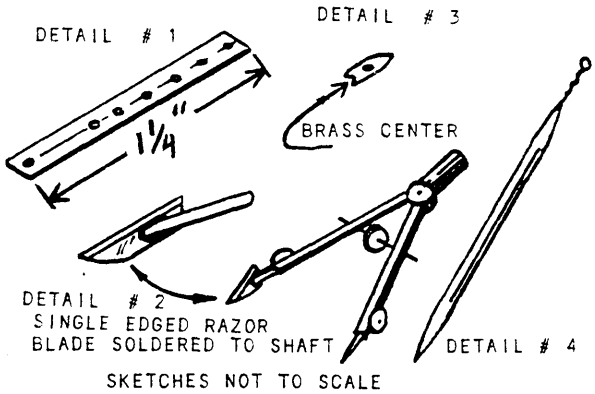
Making tires: In the past I tested all kinds of schemes to make tires, but two plies of balsa for each half tire works best. For one pair of wheels cut balsa strip long enough for eight (8) tire rounds, wide as the tire diameter. Allow for errors in width and length. Sand down this strip to slightly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

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

Formula for winding jig: The number of pins divided by two must be uneven. So if you can make a jig for 6, 10, 14, 18 etc. Hungerford uses 18. The base of the jig is level hard ply, sprayed with white Folquil. The pins are made of 1/32" piano wire, somewhat pointed, but not sharp. Pre-drill smaller holes with a drill press to be perpendicular, fill them with Ambroid and drive the pins held plumb with another jig. Place the some what longer center pin first, slide first hole of the aluminum strip (detail # 1) over the center pin and draw the rings with a pencil inserted in the other holes.

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

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



SKETCHES NOT TO SCALE

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MUELLER - WHEELS
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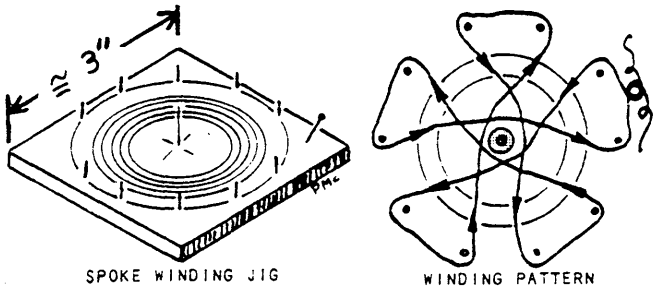

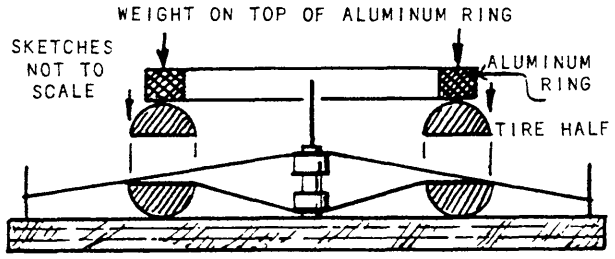

CROSS SECTION JIG AND WHEEL
PRIOR TO GLUEING SECOND SET SPOKES

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Making Foam Wheels
By Paul McIlrath

FROM MAX - FAX news letter of D.C. Maxecuters $ 15.00 /year and worth every cent. Plan sheet, two slick photo pages. Treasurer:

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

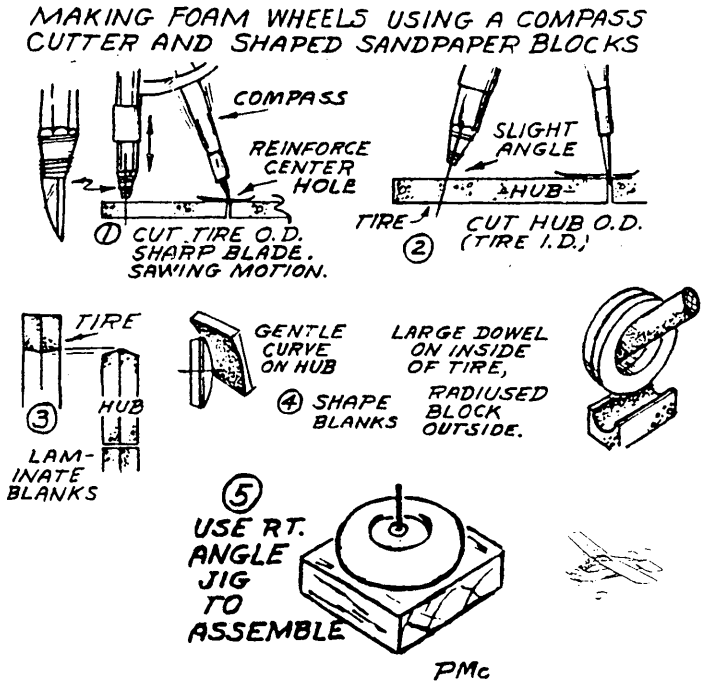
1. Pierce center hole in foam sheet and reinforce with tape. Bind & glue a chip from a single edge razor blade in the pencil from a cheap compass - 1/4" projection. Cut tire O.D. (two blanks per wheel) with compass blade vertical. Use sawing motion to prevent gouging.

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

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

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

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



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MODEL BUILDER

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

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

****

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Balloons, Poles, and Steering

RAY HARLAN

Introduction

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

Equipment

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

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

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

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

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

The reel deserves special attention. Too many modellers use very cheap reels and spend a lot of time untangling line. A good spool type reel (Penn 209 or 210) with level wind mechanisms are worth the cost. Spinning reels are inappropriate because the bail must be cocked to release the line and the line can't be controlled without letting it slip between fingers. Bait casting reels have the same problem and an added one. Because the spool is covered, and the handle is stationary when line is released, it is difficult to observe line moving slowly out the reel. This leads to the possibility of cheating by stopping the prop of a descending model on the tube or line, and, while steering to another position in the flying site, slowly allowing the model to gain altitude. At a meet where I was CD'ing I observed the line near the exit hole wiggling while one flier was steering his model a generous distance from where he engaged the model. Since the monofilament has a permanent coil set to it, the wiggle clearly indicated .

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

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

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

Steering with a Balloon

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

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

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

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

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

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

Steering with a Pole

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

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

Retrieving Models with a Balloon

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

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

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

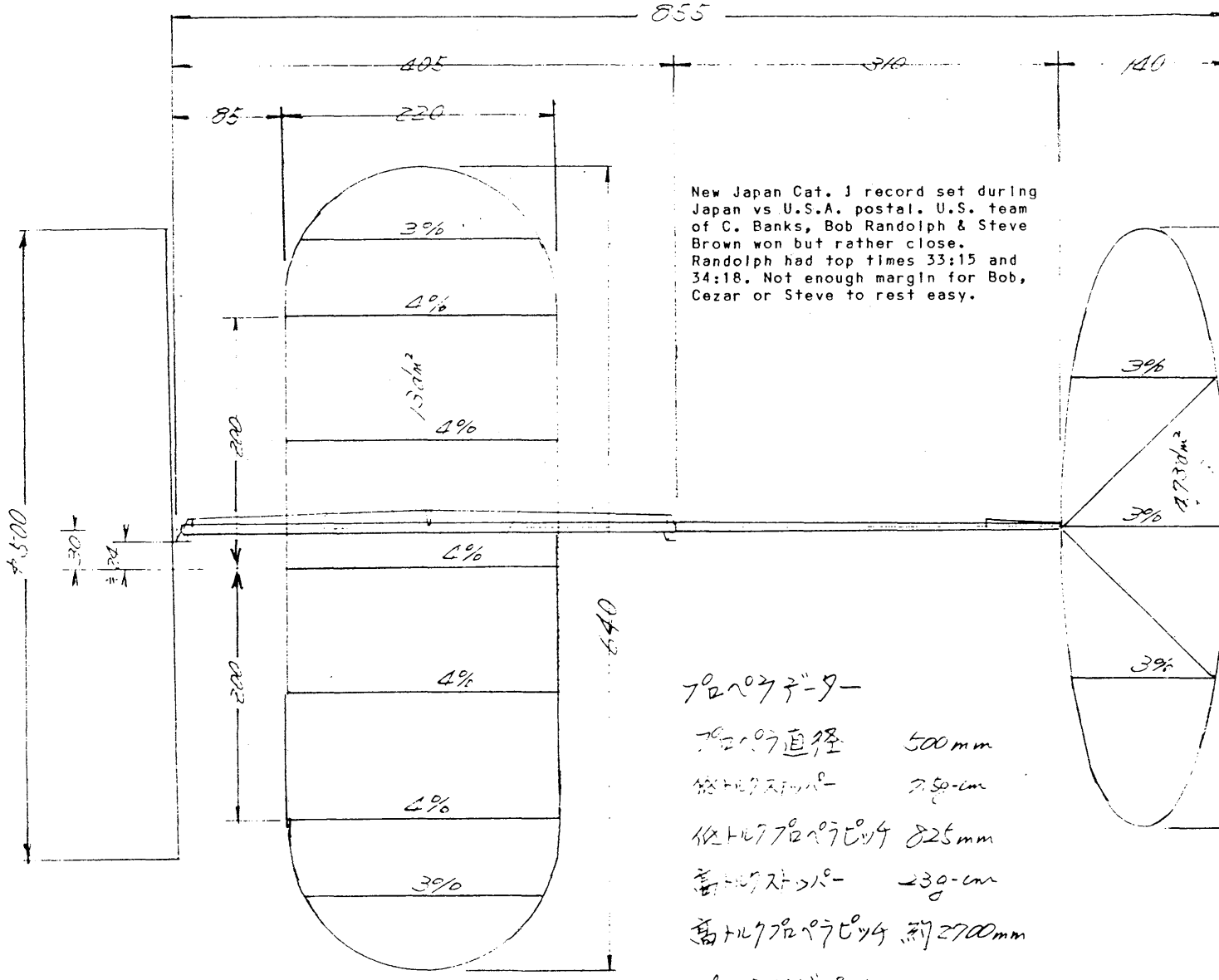
Move the balloon back up near the model. The second reel is released at the same time and the holder moves away from the balloon so that his line makes an angle of about 45 degrees with the floor. A third person acts as an observer and orchestrates each person's moves so that the balsa stick can be maneuvered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

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

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

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

Ray Harlan
15 happy Hollow RD
Wayland MA 01778



New Japan Cat. 1 record set during Japan vs U.S.A. postal. U.S. team of C. Banks, Bob Randolph & Steve Brown won but rather close. Randolph had top times 33:15 and 34:18. Not enough margin for Bob, Cezar or Steve to rest easy.

プロペラデーター

プロペラ直径	500 mm
低トルクストッパー	7.5 cm
低トルクプロペラピッチ	825 mm
高トルクストッパー	23 cm
高トルクプロペラピッチ	約2700 mm
プロペラジグピッチ	800 mm

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

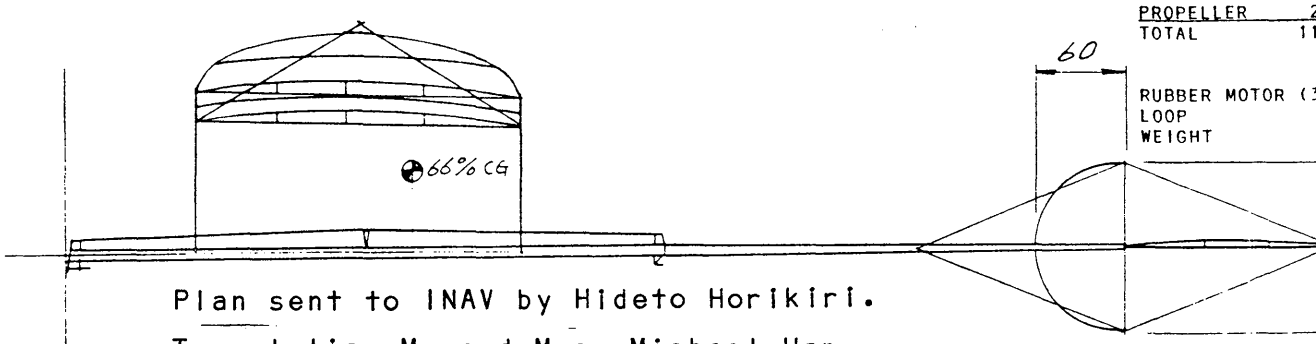
PROPELLER DATA

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

DRAWING

第三角法

MOTOR STICK	3
MAIN WING	3
TAIL BOOM	2
PROPELLER	2
TOTAL	11



RUBBER MOTOR (3
LOOP
WEIGHT

Plan sent to INAV by Hideto Horikiri.

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

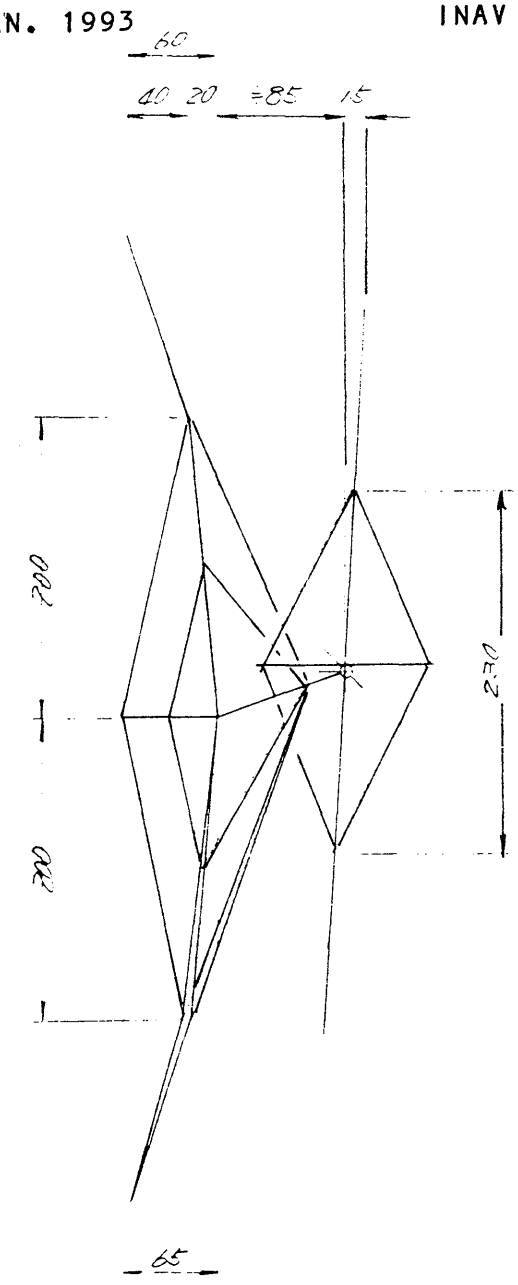
DESIGN & FLIGHT BY SATOSHI KINOSHITA CAT I JAPAN RECORD 31m

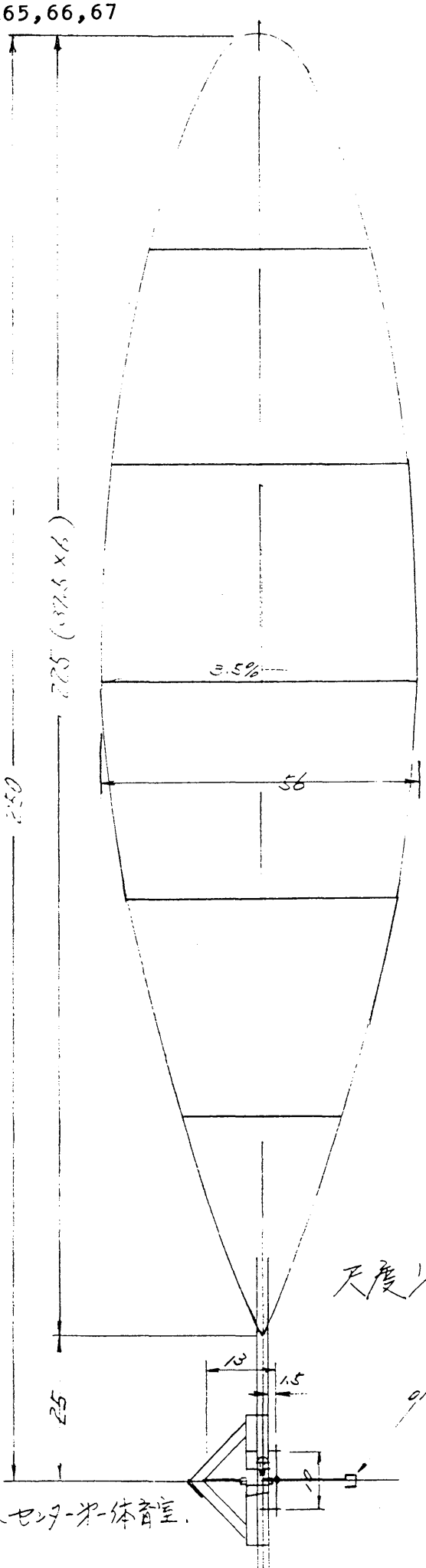
神奈川インドアープレーンクラブ 1992. 9.26 KANAGAWA INDOOR 9-26-92 SATO

木下 悟

TIME: CATEGORY

AT YOYOGI GYMNAS





SCALE 1/5

尺度 1/5

尺度 1/1

322 mgm
333 mgm
220 mgm
232 mgm
07 mgm

338mgm/10cm) TAN
345mm
1166 mgm

110

ﾓｰﾀｰｽﾃｨｯｸ	322 mg
主翼	333 mg
ﾃｰﾙﾌﾞｰﾑ尾翼	220 mg
ﾌﾟﾛﾍﾟﾗ	232 mg
機体重量	1107 mg

ゴム (338mg/10cmﾙｰﾌﾟ) TAN

ﾙｰﾌﾟ 345mm

重量 1166 mg

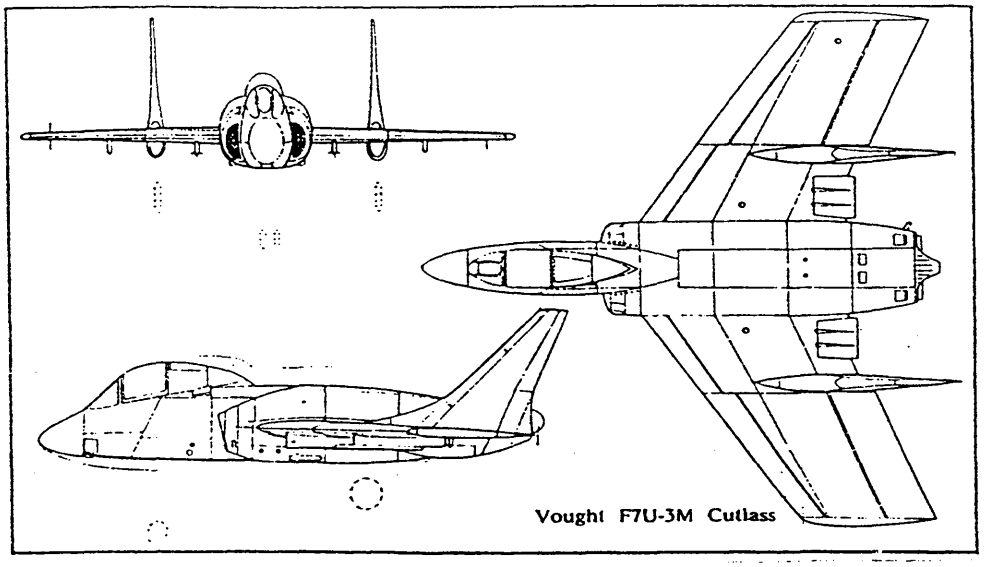
29s

AIRPLANE CLUB
OSHI KINOSHITA

ONE 31 min. 29 sec.

SIUM

ベストタイム カテゴリー1 31分29秒
1992.9.25 於 木更津総合センター体育室.



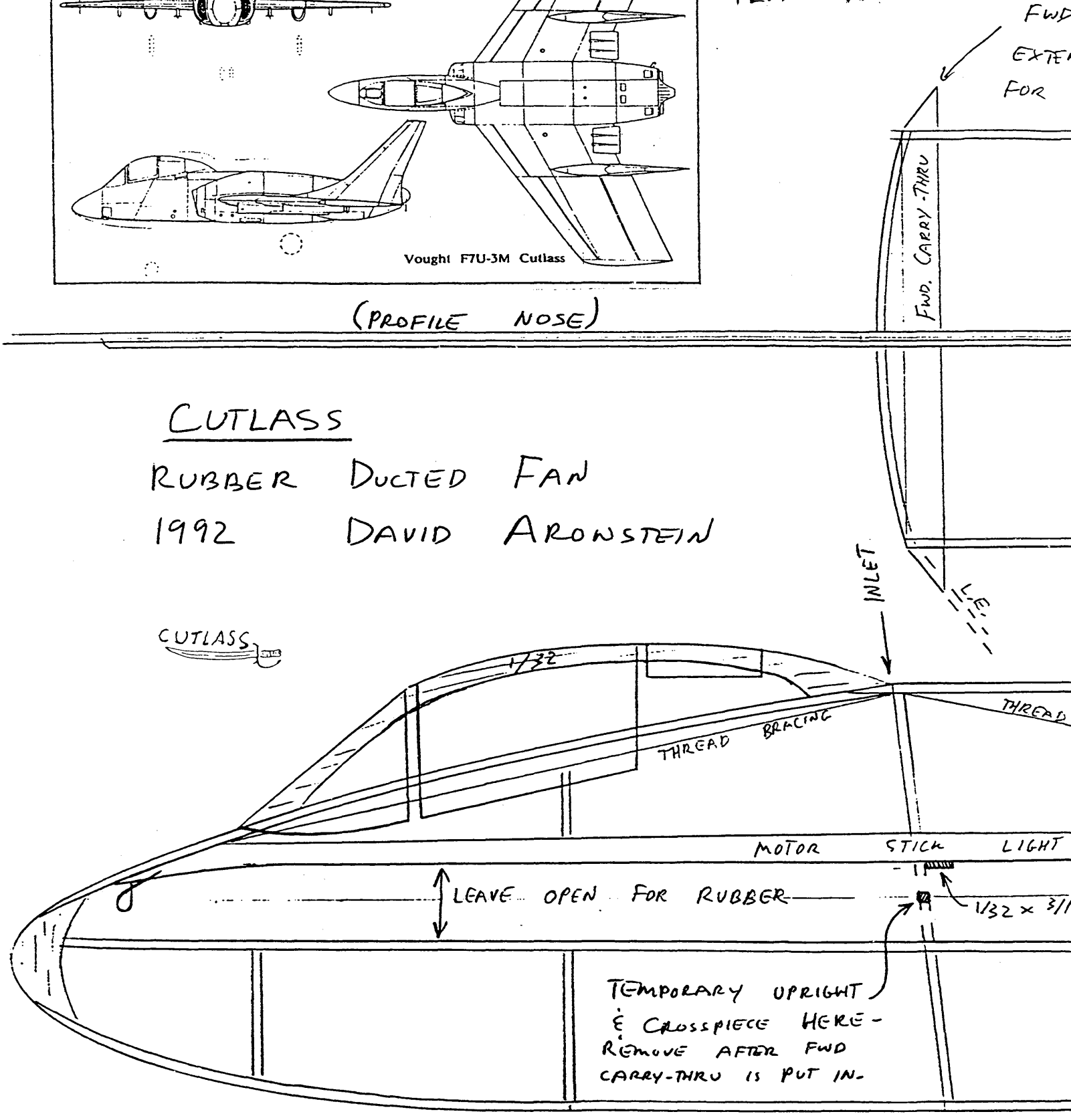
PLAN PAGE 1

(PROFILE NOSE)

CUTLASS

RUBBER DUCTED FAN

1992 DAVID ARONSTEIN



FROM - **Newsletter No. 62, June/July 1992**

Boeing Employees Free Flight Model Flying Club *

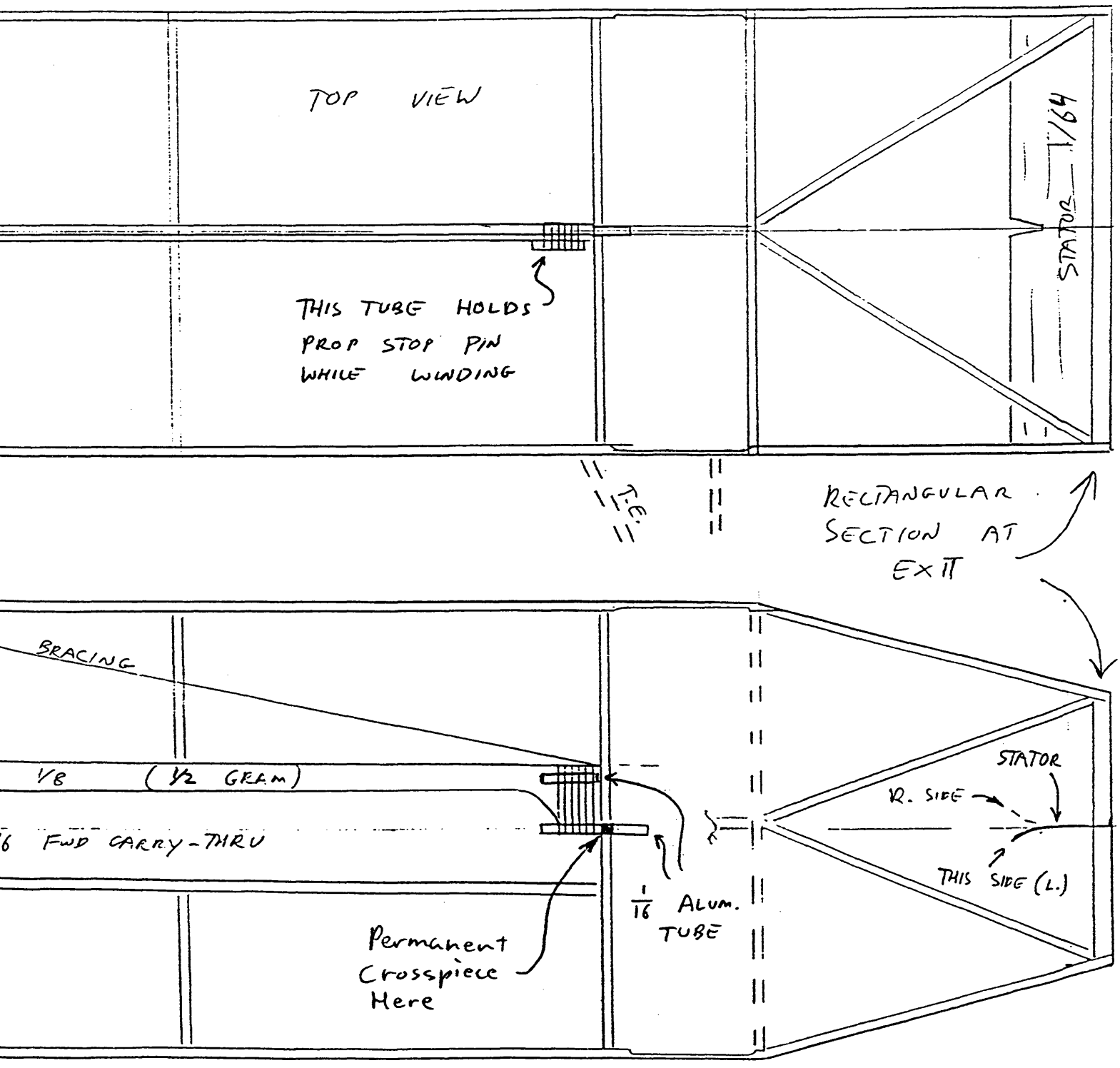
(* also known as the Boeing Hawks)

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

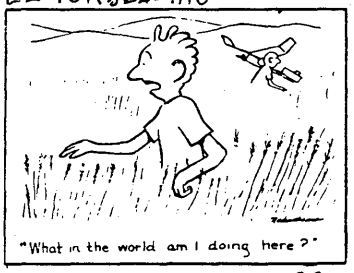
CARRY-THRU

NDS OUTBOARD OF DUCT,

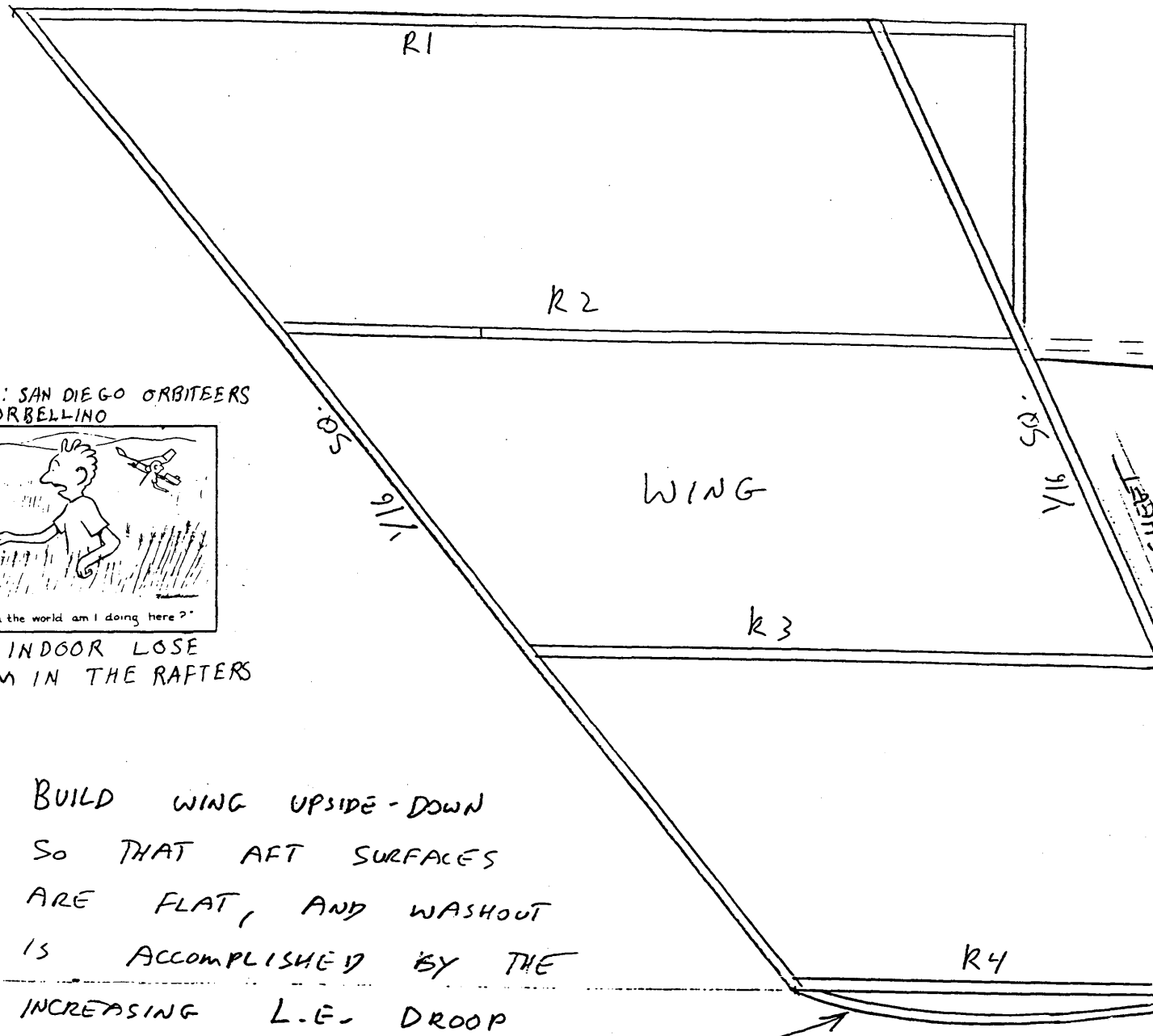
WING L.E. TO SIT ON.



FROM: SAN DIEGO ORBITEERS
EL TORBELLINO

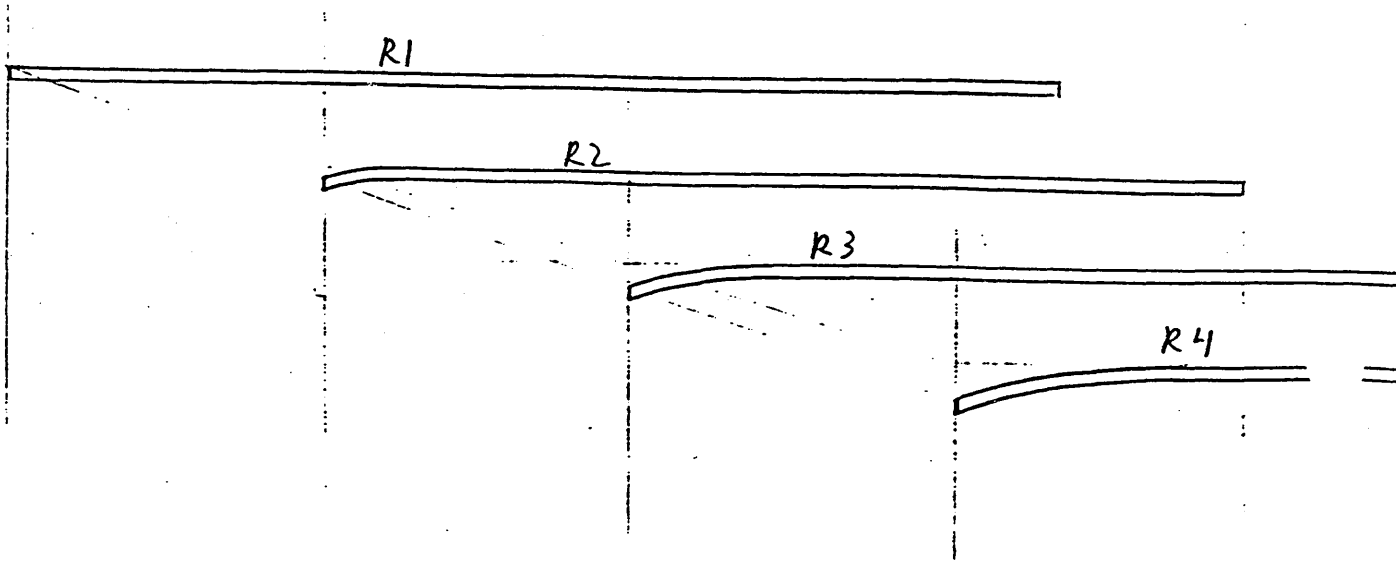


FLY INDOOR LOSE
THEM IN THE RAFTERS



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

TIP IS ANOTHER R4, ON



PLAN PAGE 2

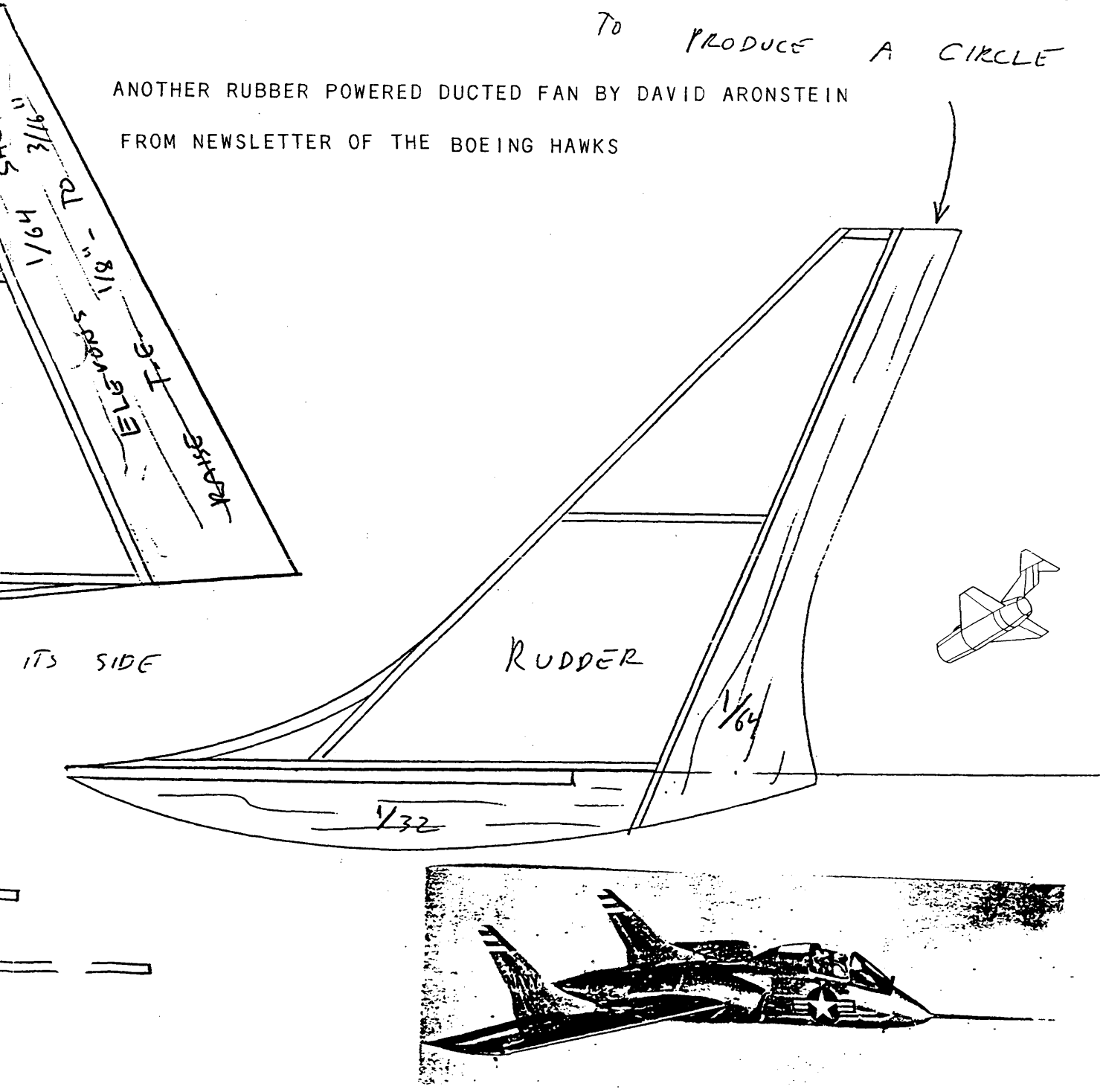
CUTLASS

RUBBER DUCTED FAN
1992 DAVID ARONSTEIN

MAKE FIRST FLIGHTS WITHOUT 1/64 RUDDER TABS THEN MOUNT THEM AT WHATEVER ANGLE NEEDED TO PRODUCE A CIRCLE

ANOTHER RUBBER POWERED DUCTED FAN BY DAVID ARONSTEIN

FROM NEWSLETTER OF THE BOEING HAWKS



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

SITE LIST

AZ Flagstaff Cat IV (147') Red Boyles,602-838-9602
CA Burbank Cat I Second Thursday 7-10 PM Tony Nacarrato 818-842-5062 AMA & club contests and FUN fly nights
CA L.A. Luther Burbank H.S.gym Cat I Ken Johnson 818-368-0448
CA L.A.Cat II Naval Res.Armory Stadium Way, Ken Johnson 818-368-0448
CA Marin CO. Cat II Tom Brennan 707-938-2893
CA San Diego Colina Del Sol Community Center Howard Haupt 619-272-5656
CA Santa Ana Cat IV Curt Stevens 714-586-5779
CANADA Burlington and others Dan O'Grady, 50 Largo Crescent, Nepean, Ontario, Canada K2G3C7
CANADA Toronto Markam H.S. and C.W.Jefferies Gym John Marett 416-429-0815
CO Aurora Must help college level Aero Eng. Students John Berryman 303-492-1005
CO Denver Bill Gibbons, 7422 Clubhouse RD, Boulder CO 80301 Phone 303-530-5526
CT Glastonbury Fun & Occ. contest George Armstead 203-633-7836
CT Norwich Jerry Bocklus 203 442-8003
CT Wilton Roger Kleinert, 17 Gardiner ST, Darien CT 06820 phone 203-655-1585
FL Miami Cat I Dad Co. Youth Fair fun fly also see FL contests Doc Martin 305-858-6363
FL Pensacola Jeff Dunlap 214 Sprague Ave Pensacola FL 32534 Phone 904-478-2687
HI Honolulu Ed Kuramoto, 3856 Maunaloa AVE, Honolulu HI 96816
IA Cedar Rapids Paul McIlrath,1524 48th ST NE, Cedar Rapids IA 52402 Phone 319-393-4677
IA DesMoines Jack Textor, 29 SW 58th DR, Des Moines IA 50312 Phone 515-277-4173
IL Glen Ellen (west Chicago) Mon.evenings Don Lindley 708-355-9674
IL Chicago Cat III Charles Sotich 312-735-1353
IL Rantoul Cat II Chanute A.F. base hanger # 1 smooth ceiling Chuck Markos 312-945-9225
KS Topeka Jack Koehler 913-272-8439
KS Witchita Stan Chilton, 725 E Lincoln, Witchita KS 67211-3302 Ph 316-686-9634
KY Louisville Cat I KY Air Nat Guard Hangar and Sawyer State Park Gym. Mason Plank 502- 634-8191
MA Boston (M.I.T. DuPont gym) 40' 1st Sat of Feb,Mar,April,May Ray Harlan 508-358-4013
MA Andover Cat II Phillips Academy Dom Walworth 603-898-5338
MI Flint Mc Kinley Middle School Curt Haskell 313-232-0354
MN Burnsville Catll John O'Leary 612-888-0638
MO St Louis Jefferson College 25 Miles S. St L. Larry Coslick 4202 Valleycrest Hills DR, St Louis MO 63128 314-892-3803
NE Beatrice John Pakiz, 4523 Poppleton AVE, Omaha NE 68106 Phone 402-551-2964
NJ Union Area Fergus Collisn, 48 E Hazelwood AVE, Rahaway NJ 07067
NM Aztec at H.S. H.S. "Hoby" Clay 5604 Cederwood ST, Farmington NM 87401
NY Cantlague Park Long Island Cat II Summer only Rich Fiore 516-249-4358
NY Chappequa Art Malden 914-769-2284
NY Kingston Cat I Bob Hudson 518-273-7468
NY Long Island Mitdhell, Field Cradle of Aviation Museum Bob Bender 212-222-1546
NY Locust Vally Fred Dippel, 2 David CT, Glen Cove L I NY 11542 Phone 516-671-2858
OK Tulsa National Guard Armory, George Calvert, RT 4 BOX 188A , Wagoner OK 74467 Phone 918-627-7200
PA Bryn Athen cat I Aspulndh Field House Joe Krush 215-688-3927
PA Philadelphia Cat II Joe Krush 215-688-3927
PA Eastern Walt Eggert, Jr., 26 Moredon RD, Huntington Valley PA 19006 Phone ?
TX Fort Worth-Dallas Cat I Boys Ranch Bedford TX Jesse Shepherd SR. 817-282-3770
UT Salt Lake City Cat I San Juan College Gym Jay Jackson 801-485-0314
UT Salt Lake City Evergreen Jr. H.S. Gordon Pollock 801-278-5636
VA Newport News Abram Van Dover 112 Tillerson DR, Newport News VA 23602
WA Seattle Oct.thru April once per month (Saturday ?) Naval Reserve Training Center. Gene Stubbs 2119 NE 81 st ST, Seattle WA 98115 SASE. Phone 206-522-7047 or Ed Lamb, 15911 SE 42nd Place, Bellevue WA 98006 Phone 206-522-7047
WA Seattle Boeing Hawks Kent Rec Center Andy Page 206-431-0887
WI Milwaukee Gordon Wisniewski, 4790 Stratford DR, Greendale WI 53129 Phone 414-421-3696 or 645-5454

CONTESTS

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

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

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

COVERING INDOOR MODELS IN A HOT-BOX

by Roy Bourke
Markham Indoor Group

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

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

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

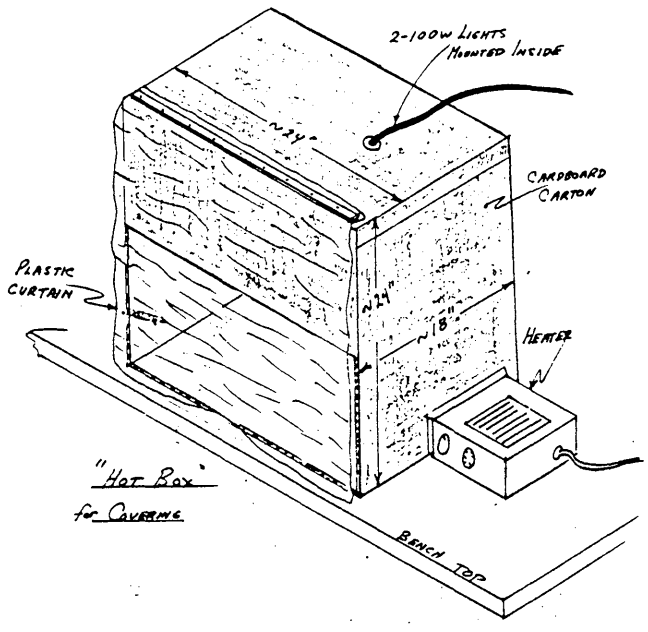
The answer of course is to cover the model in a very low R.H. environment, but you are unlikely to ever encounter such an environment in your workshop. In fall, the prevailing air masses are too moist, and in mid-winter home heating systems humidify the air to a comfortable R.H. level. However, you can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

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

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

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

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



INDOOR MATERIAL SUPPLIERS form VOL LIBRE

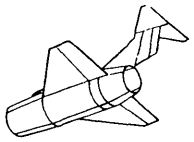
via BAT SHEET N.L. of the Strat-O-Bats

With notes and added listings by your editor.

NOTES on SUPPLIERS

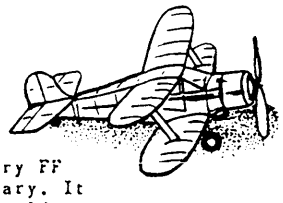
I know you old timers have seen this list but your beginners have not so make copies and a few notations for your new flyers. Jones has a good balsa stripper and good selection blades. Note he has a new address. Same house just address change. Jim had a bad leg fracture and may or may not be able to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

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



Small Parts Inc.
13980 NW 58 th Court
P O Box 4650
Miami Lakes FL 33014-0650
All sorts of small to very small stuff. Minimum order $15.00 no postage do not worry you will find enough to get to $15.

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



Aircraft Data
Box 763576, Dallas, TX 75224
Peanut plans & book:
"Making Scale Model Airplanes Fly"
Bill McCombs book is something every FF Scaler should have in his/her library. It is extensive and intensive, and should answer most any question a beginner in this branch of the hobby should have. $ 12.95PP. Highly recommended.

CO2 and Mini Electric

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

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

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Box 210, Magalia, CA 95954

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

F.M. Warplanes $ 14.95 + post $ 3.00
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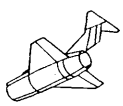
Here in one place you will find about 20 NO-CALS, a set of 6 Peanuts, a raft of FAC type scale models, a few Models of Models and about eight documentation packs for the serious scale modelers. Prices are reasonable. Send a SASE and $1.00 for green price sheet if you are the only gum band modeler in the northern hemisphere who does not have it.

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

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

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

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



LISTINGS CONTINUED NEXT PAGE

LISTINGS CONTINUED FROM PAGE 16

INDOOR MATERIAL SUPPLIERS form VOL LIBRE

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

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

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

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

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

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

Golden Age Reproductions
Box 1685, Andover, MA 01810
Scale kits & Plans; cat $2.50

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

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

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

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

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

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

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

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

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

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

Netcraft Co.
2800 Tremainsville Rd.
Toledo, Oh 43613
Telescoping fiberglass poles

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

Nowlen Aero
139 Boardwalk B
Greenbrae, CA 94904
Peanut scale kits

Oldtimer Model Supply
Box 7334, Van Nuys, Ca 91409
Owner: Ken Sykora
Selected indoor supplies, scale pla[illegible] cat $2.00

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

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

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

R.G.O.A Poles
936 Hamal Dr., Littleton, CO 80124
Owner: Rick Pangell
21ft. telescoping fiberglass poles

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

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

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

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

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

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

****

Jim Jones on Tail Booms

One of the hardest tasks in building a straight tapered tail boom is in keeping the glue seam straight. The joint adds to the strength in flexing, so if the glue joint ends up straight then the tapered tube will not want to bend up and down as easily as it will sideways. Since the forces on a tail boom want to bend it upwards, then a nice straight glue joint opposite the major bending forces will be an asset. Two years ago out of desperation I tried the method in the sketch. On the first try I was amazed. The tube came out perfectly straight and the glue seam came out perfectly straight, but it looked horrible when compared it to the nice straight tapered tubes that everyone else has at the contests. After I glued it together I was able to forgive the looks of it. The wood compressed under the rubber was stronger than the wood elsewhere. After glueing it together it would not flex as easily, in any direction. It reminded me of the cardboard tubes that the rug manufactures use to hold rolls of carpet. This has not been tried on a straight tube, but that will be next. They look horrible but are really strong, without added weight.

CAN-FORMED PROP BLADES

bob meuser

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

INTRODUCTION

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

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

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

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

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

DETERMINING THE TWIST RATE

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

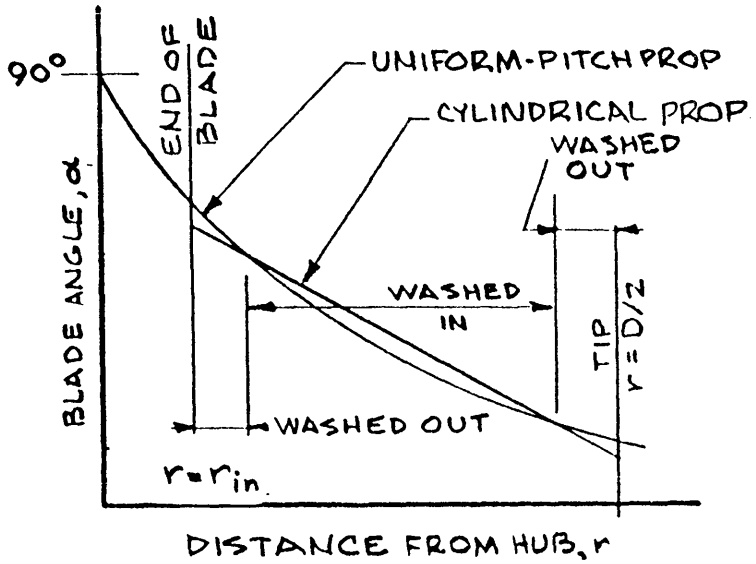


Figure 1: Variation of Blade Angle with Radius

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

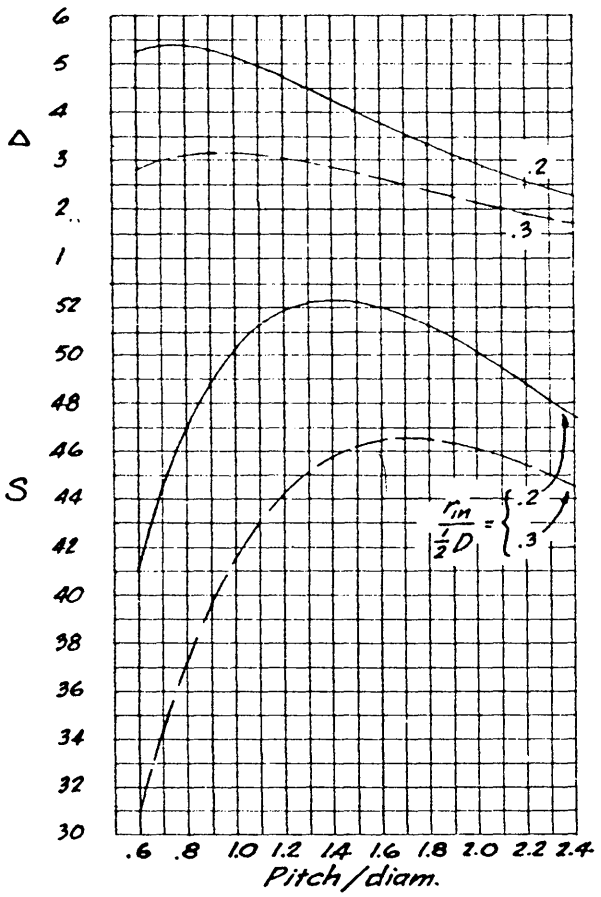


Figure 2: Twist Rate

* NOT REPRINTED HERE REFER TO SYMPO 1973

CONTINUED ON PAGE 19

CONTINUED FROM PAGE 18

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

SELECTING THE CAN SIZE AND HELIX ANGLE

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

SETTING THE BLADES AT THE PROPER ANGLE

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

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

AN EXAMPLE

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

Prop diameter, D = 17 in.
Pitch, P = 25 in.
Blade chord, c = 2 in.
Camber ratio, h/c = 0.11 (11%)
P/D = 25/17 = 1.47
c/D = 2/17 = 0.118
F = (h/c)/(c/D) = 0.11/0.118 = 0.93, say 0.9

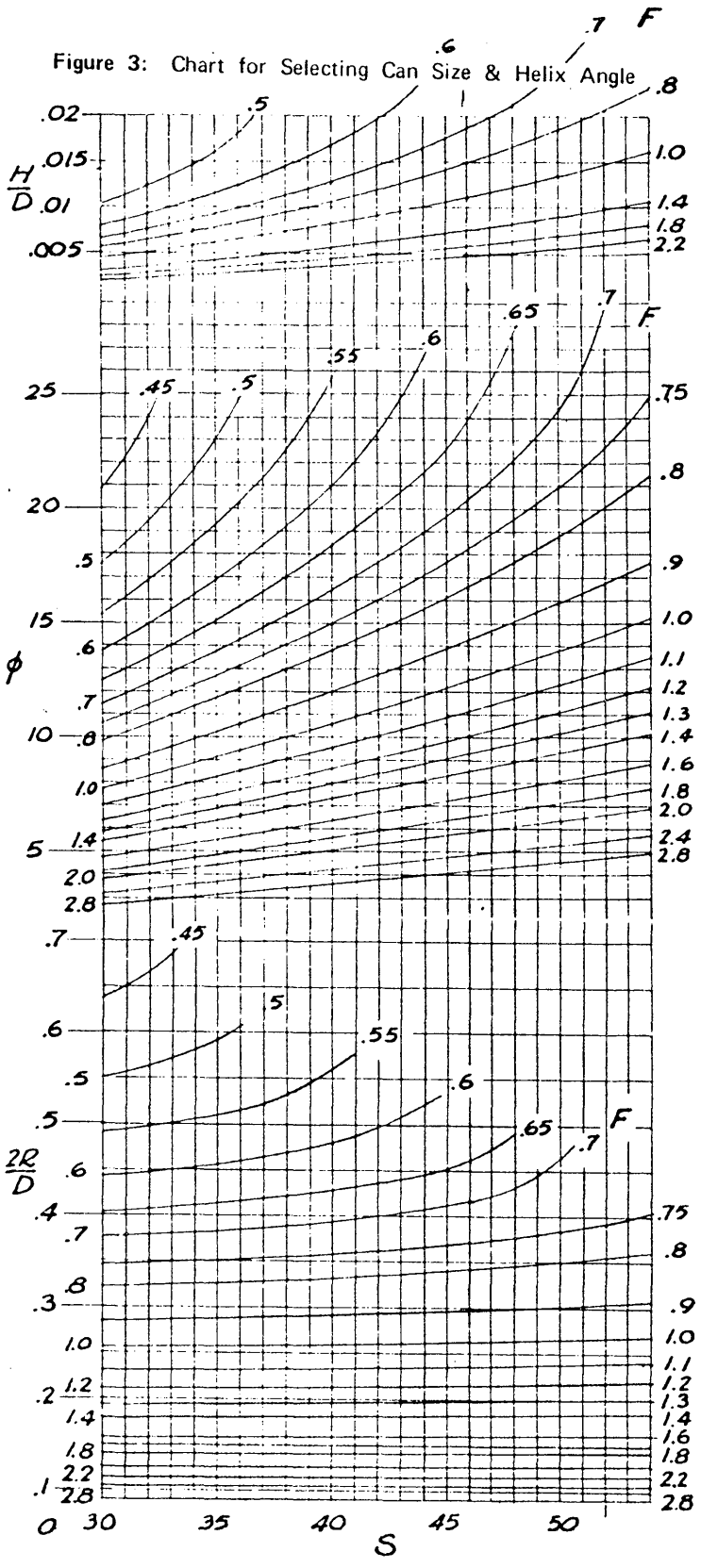
We'll use a blade that starts 30% of the way out from the shaft to the tip; $r_{in}/\frac{1}{2}D = 0.3$. For that value and for P/D = 1.47, from Figure 2 we obtain S = 46.1 degrees.

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

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

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

Figure 3: Chart for Selecting Can Size & Helix Angle



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

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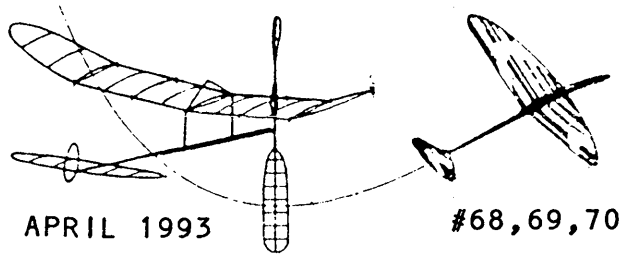
INDOOR
NEWS and VIEWS



APRIL 1993 #68,69,70

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

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JOHNSON CITY TN JUNE 3,4,5,6 See page 6

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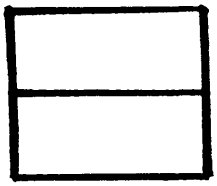
SIGN A FRIEND UP -  EXPIRES THIS ISSUE

HELP MAKE INAV BETTER EXPIRES NEXT ISSUE

CHECK ADDRESS LABEL. IF # 68,69,70 THIS IS YOUR LAST ISSUE. Do not depend on "RED X."

NEW HONOR FOR INAV

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

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

JOIN

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

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THE JOY OF FLYING FREE

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

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

A TIP OF THE HAT

TO THOSE WHO MADE INAV HAPPEN

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

SEE PAGE 2

THOSE WHO MADE INAV HAPPEN

YOU for supporting your editor and INAV with your subscription.

† Deceased

Colleen S Bates
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Burr Stanton *
Millard Wells
Tom Winter
All at MAX-FAX
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Hideto Horikiri
Anyone I Missed
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Harvey Pastel

Tom Green

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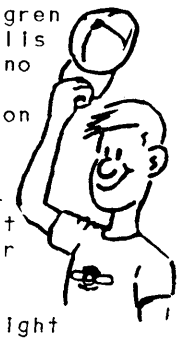


ALL F.F. N.L. Editors

++++++++++++++++++++++++++++++++++++

Any given propeller does the best it can.

Phil Hartman

June 3, 1992

++++++++++++++++++++++++++++++++++++

NEW TOOLS

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

Both laproscope tools $20.00 postpaid.
One laproscope tool $10.00 postpaid.
Get both, at your friendly neighborhood body cutting place the set is about $300.00.

Cautery / scalpels set $10.00 postpaid.

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

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

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

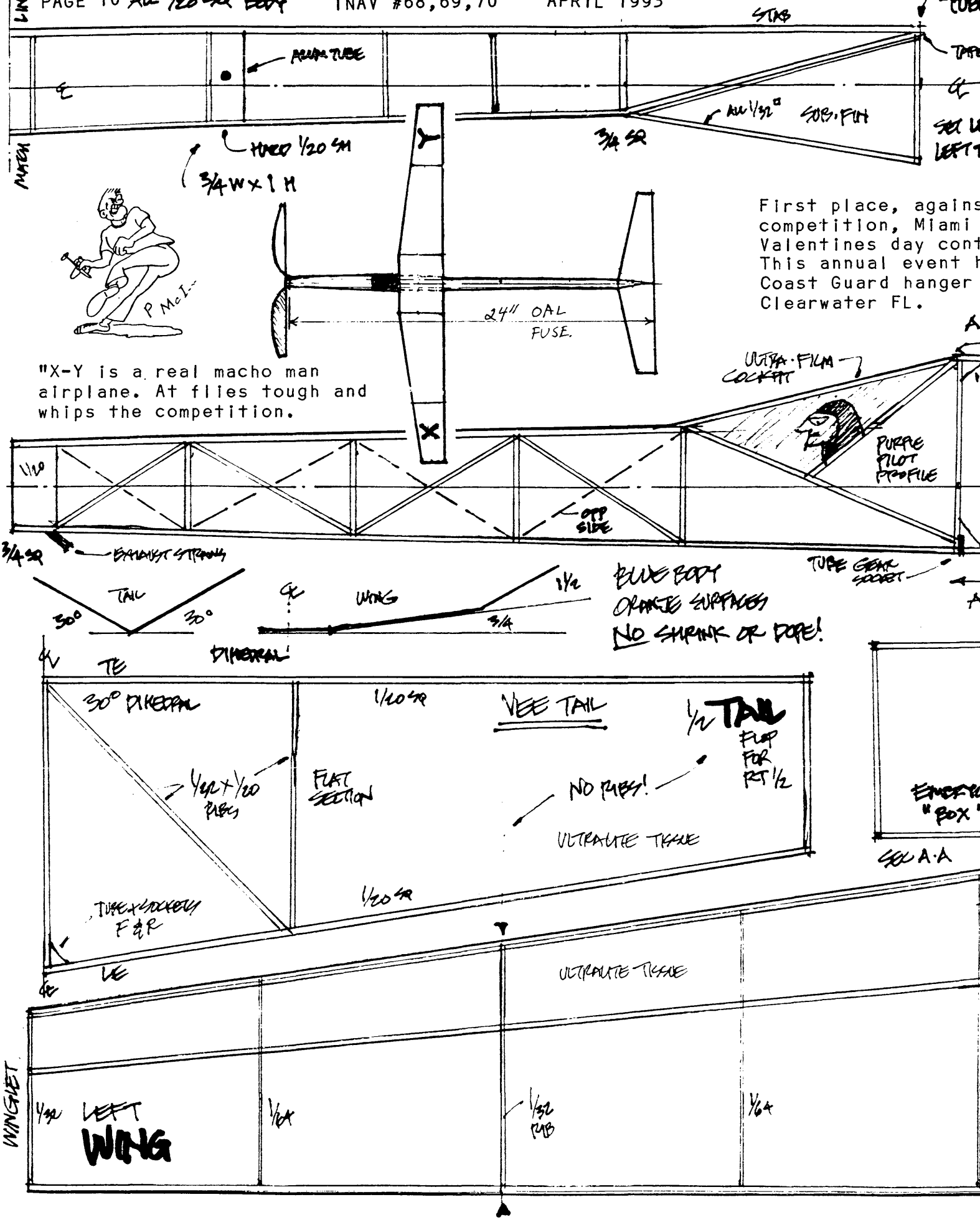
++++++++++++++++++++++++++++++++++++

BUILDING BOARD

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

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

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



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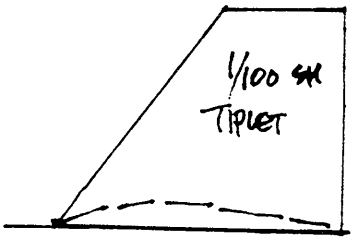

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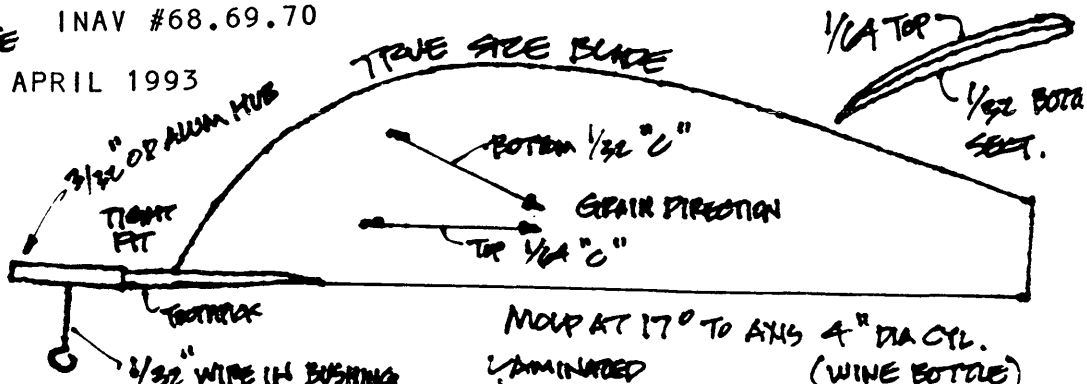

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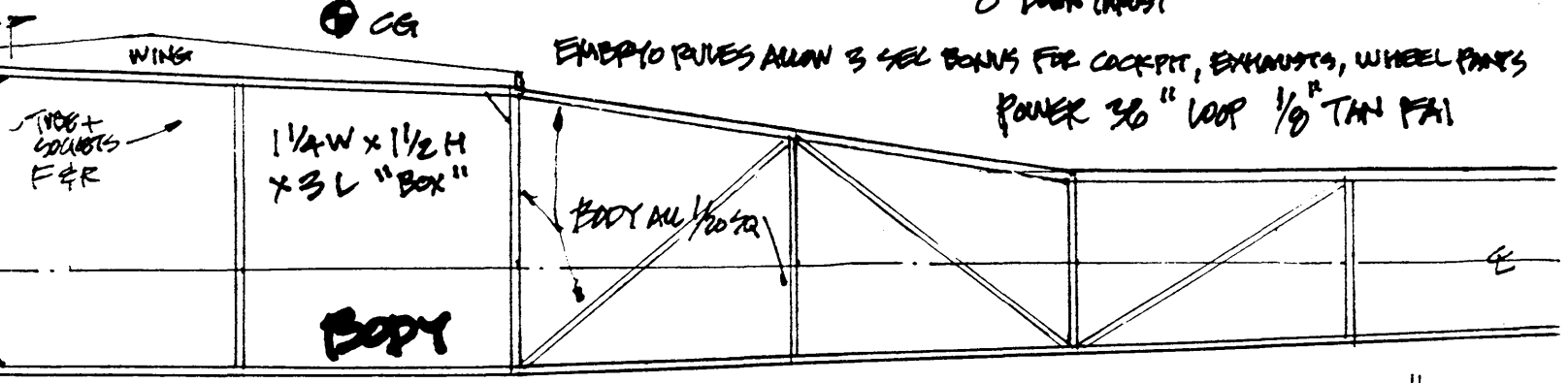

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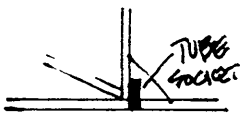

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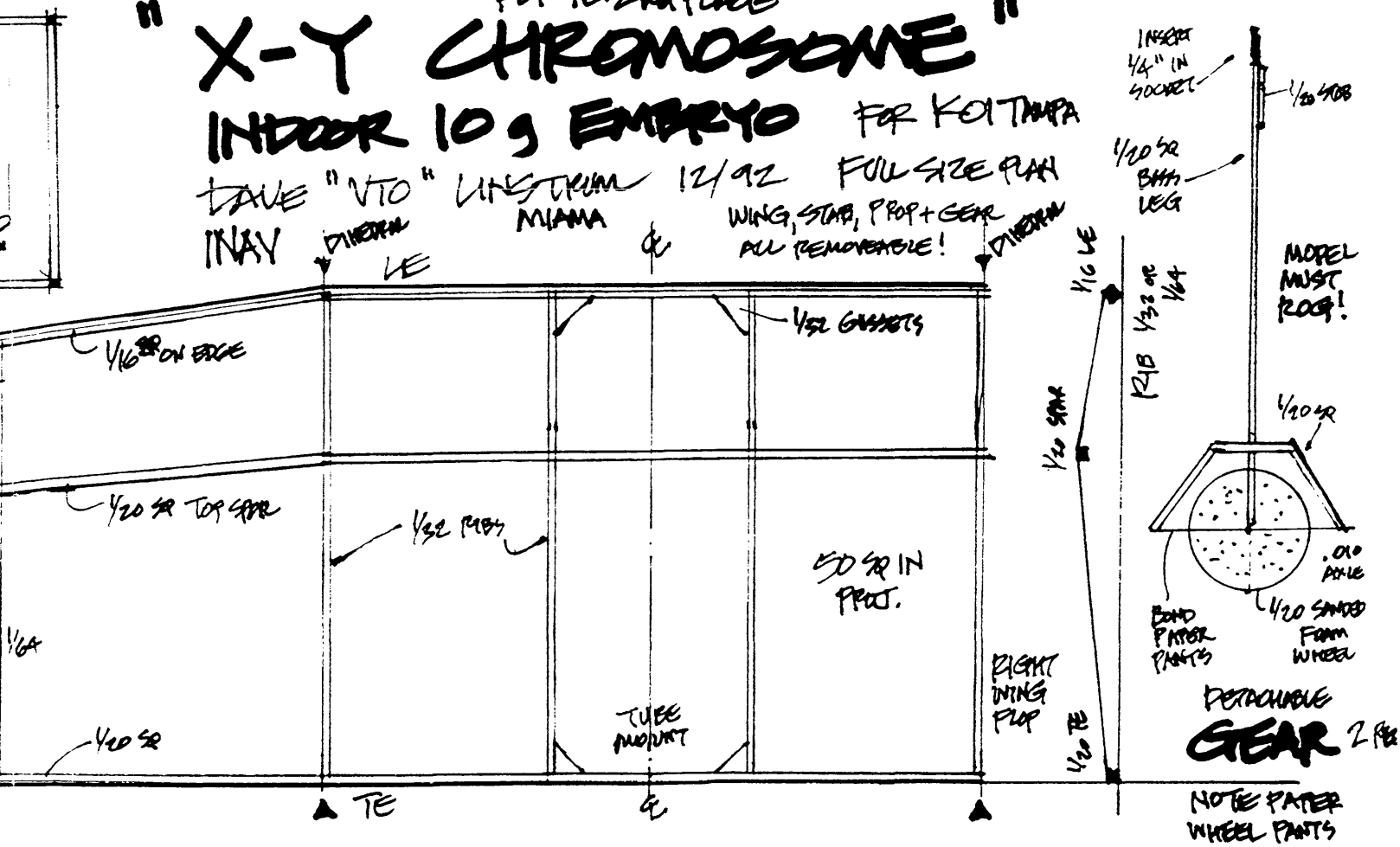
INAV MIAMA

WING, STAB, PROP + GEAR ALL REMOVEABLE!



MODEL MUST ROG!

DETACHABLE **GEAR** 2 REQ

NOTE PAPER WHEEL PANTS

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

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

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

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

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

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

TOM IACOBELLIS
USIC MANAGER
198 MANHATTAN AVE
HAWTHORNE NY 10532

****

WHOLE LOT ABOUT HOLES

from: Otto Curth, Chicago Aeronut

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

fig. 1

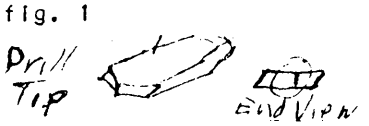
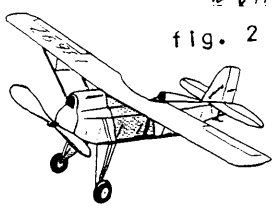


fig. 2



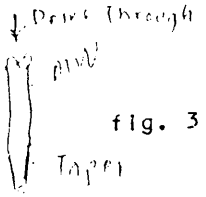
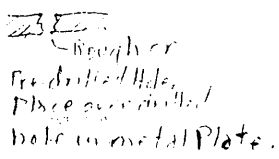


fig. 3



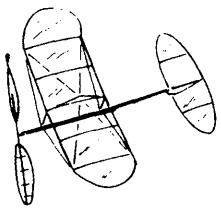
IMPORTANT RE: USIC/NATS

COVERING TIP

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

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

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



NO SMOKING

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

MOVING ? SEND INAV YOUR NEW ADDRESS

FLAPPER FACTS

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

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

Price: $5.00 US
$7.00 overseas US funds

****

ORIGIN OF INAV LOGO

By Dave "vto" Linstrum

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

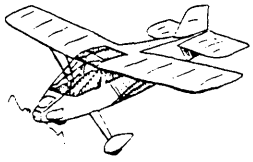
I chose the bold type face "Clarendon" and inclosed it in a dark rectangle halftone (now black) border to signify the walls of a building. which is common to our sport. Without buildings, we have no sites! In the early sixties, microfilm models and IHLG were the main types flown. I chose one of each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

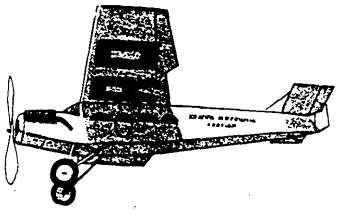
I would like to thank Bud Tenny for the opportunity to design the masthead art, and Walt Erbach, Charley Sotich and Doc Martin who have taught me about indoor. I am fortunate to have such knowledgeable mentors and friends.

VTO

Still crazy (about indoor)
After all these years

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





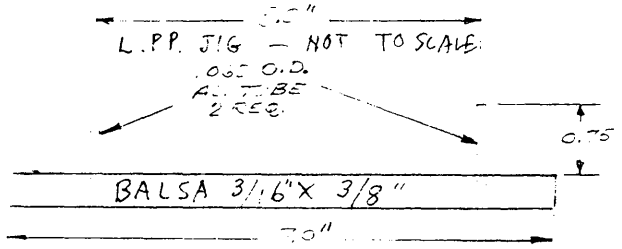
OFFICIAL WORLD RECORD

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

TISSUE TUBES

Tom Green as learned from Joe Krush

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



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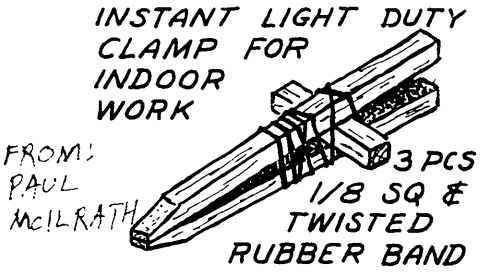

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AVERY ON LIGHT BUILDING

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

INAV $$$$$$$$$ CONDITION

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

****

LATEST ON U S INDOOR CHAMPIONSHIPS/NATS

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

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

TOM IACOBELLIS
198 MANHATTAN AVE
HAWTHORNE NY 10532
TELEPHONE: 914-592-5176 (daytime)

****

THE "I KNOW, I KNOW" DEPARTMENT:

Page 1 "deleted" has an "a" added.
Page 2 I forgot someone, don't know who, but I did.
Page 6 Text with fig.3 "drive through, music wire, taper, rough or drilled hole, place over drilled hole in metal plate." Just place the text where it will do the most good. Sorry, Otto.
Page 7 Text with jig drawing. ".062 O.D. al. tube 2 req." Sorry Joe.
Page 7 arms of the forceps are balsa 1/16 X 1/4 spacer 3/32.
Page 10 "At flies tough ....." should be "It flies tough ...."
Page 11 Sideways. Yes, it was that or type it again myself and you can see what a mess that could make of it. Bob is doing a great job with this series and we all should thank him for taking the time and expending the effort to do these pieces.

THE F1D CHALLENGE

Lt. Col. Bob Randolph

Getting Started in F1D

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

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

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

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

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

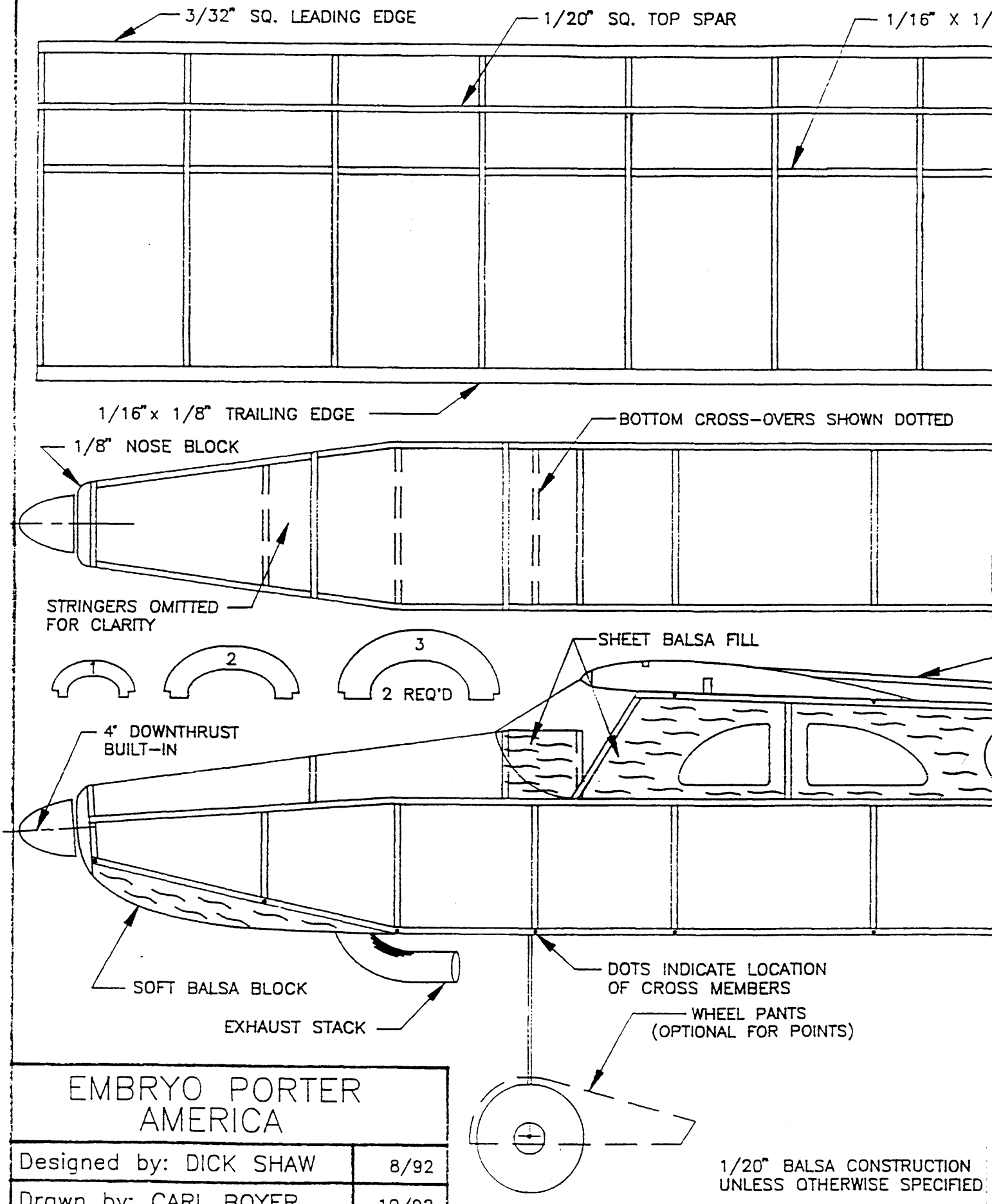
Set your own reasonable goals for certain model parts. Here are some of mine: I retire F1D Wings when they hit .012 oz. I won't use a stab frame if it exceeds .0027 oz. I won't use a cabane that exceeds .0006 oz. nor wing posts (2 plus Boron) that exceed .0014 oz.

When I was assigned in Cleveland from 1965-1968, my home was only 12 miles from Micro-X. I spent hours sorting through Jerry's 4000 sheet stock, weighing and measuring to find exactly what I needed. I will admit that I'm very picky about wood. Because of my standards, abut 75% of what I mail order from both major suppliers, I do not use. However, I never send back any wood. For several years now I have been building mostly from my "reject" stockpile, so Jerry thinks I buy from Gitlow, and Lou thinks I buy from Jerry.

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

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

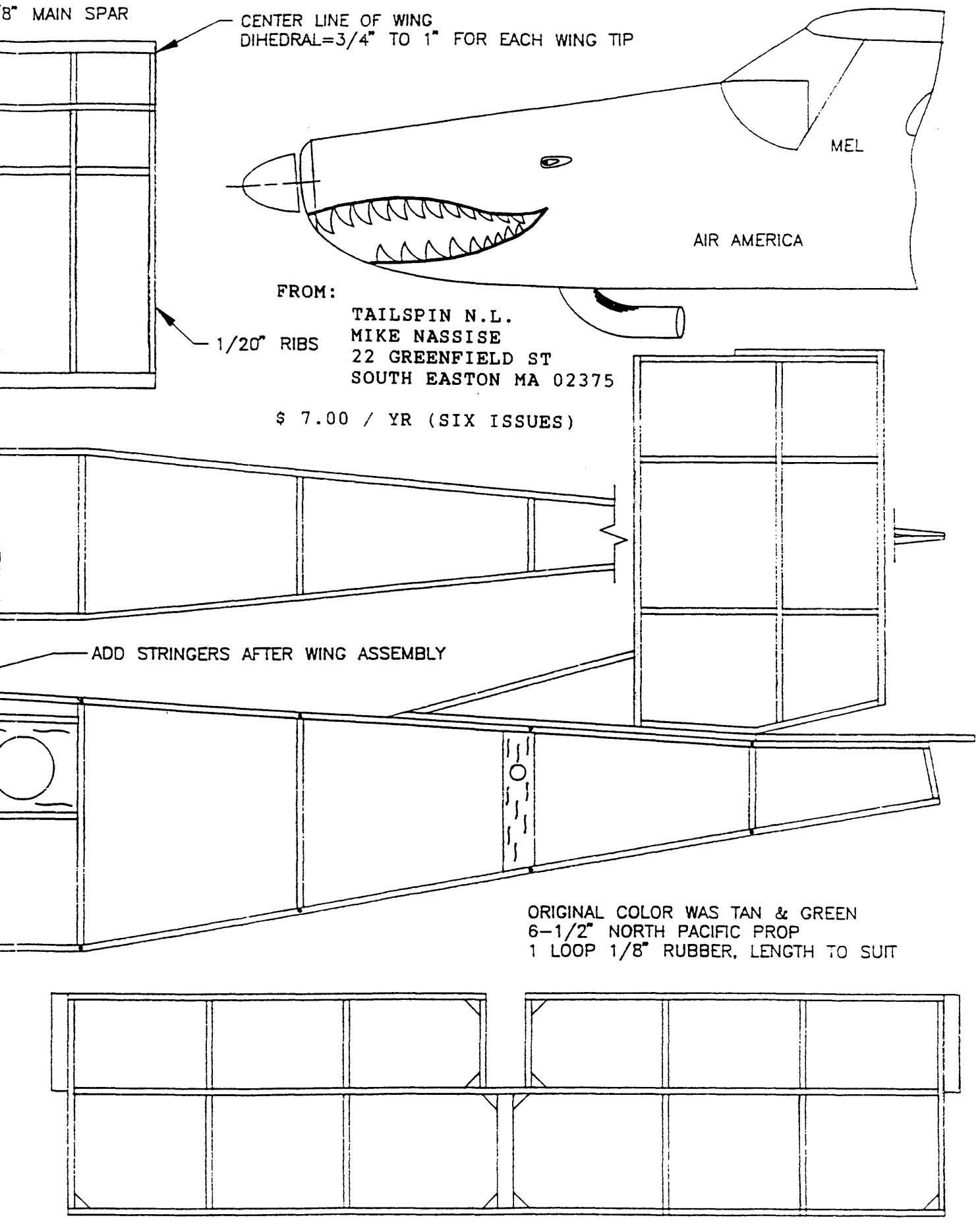
My next article will probally cover test flying and the use of partial test motors to find the optimum motor. If you can't wait, you might look up my article in the September 1991 issue of Model Aviation. Since you will need an F1D to test fly, start building and good luck.



EMBRYO PORTER AMERICA

Designed by: DICK SHAW	8/92
Drawn by: CARL BOYER	10/92

1/20" BALSA CONSTRUCTION UNLESS OTHERWISE SPECIFIED



FROM:

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

$ 7.00 / YR (SIX ISSUES)

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

INAV #68,69,70

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

TRIM TO FIT FUSELAGE. GLUE TO FUSELAGE AFTER TEST FLIGHTS

ALL TIPS ARE 1/16 FOAM

1/8 SQ

1/8 DOWEL

1/2" DIHEDRAL @ STRUT RIBS, BOTH WINGS

AXIS OF CUP

CUT BLADES @ 12° FROM FOAM DRINKING CUP. GLUE TO HUB @ 45° HERE

1/16 x 1/8 BLOCK. TRIM OR ADD TO ADJUST STABILIZER ANGLE

CROSS PCS HERE

STABILIZER

SHATZIE

BASED ON PHOTOS IN AIR PROGRESS HOMEBUILT AIRCRAFT SUMMER 1968

1/21/91 PMC

COVER SIDES & BOTTOM OF NOSE WITH STIFF PAPER BACK TO F. COVER TOP BACK TO CABIN. OVERLAP AT LONGERONS. ADD COWL CHEEKS LAST.

ALL STRUCTURE IS 1/16 THICK BALSA UNLESS NOTED OTHERWISE

TRIM TOP TO FIT 1/32 FIRM

NOTCH FOR LANDING GEAR

MODEL DESIGN : PAUL McILRATH

BOTTOM WING RIBS

STRUT LOCATION

TOP

BOTTOM

FRONT

GLUE WIRE BETWEEN 2 PCS 1/32 SHEET & FIT IN BOTTOM WING CENTER SECTION

.025 DIA WIRE

LDG GEA ASSY HE

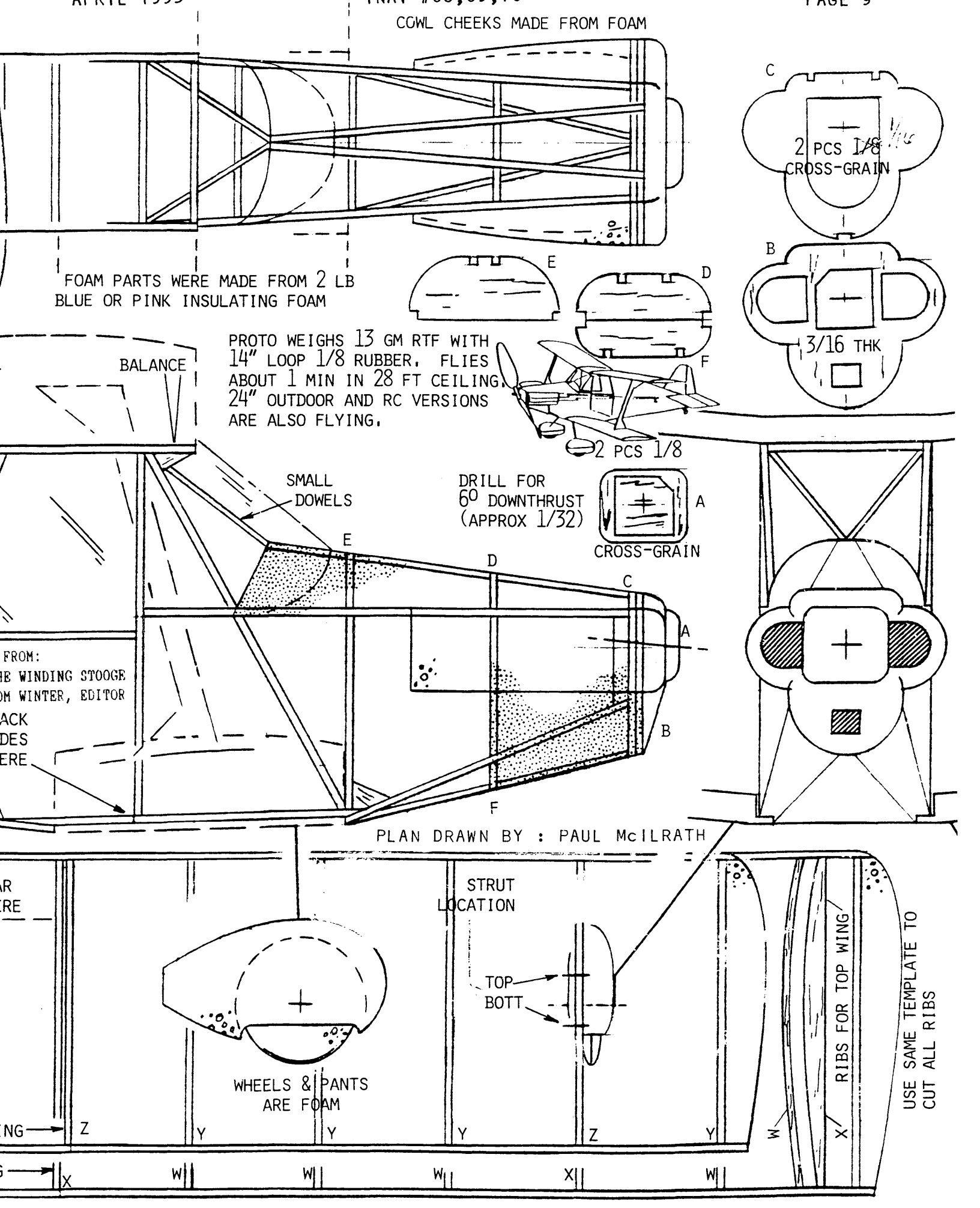
FROM: THE WINDING STOOGE TOM WINTER, EDITOR

BOTTOM WI

TOP WING

W W X W W W X

Y Z Y Y Y Z


COWL CHEEKS MADE FROM FOAM
FOAM PARTS WERE MADE FROM 2 LB BLUE OR PINK INSULATING FOAM
PROTO WEIGHS 13 GM RTF WITH 14" LOOP 1/8 RUBBER. FLIES ABOUT 1 MIN IN 28 FT CEILING. 24" OUTDOOR AND RC VERSIONS ARE ALSO FLYING.
BALANCE
SMALL DOWELS
DRILL FOR 60° DOWNTHRUST (APPROX 1/32)
CROSS-GRAIN
2 PCS 1/8 CROSS-GRAIN
3/16 THK
2 PCS 1/8
A
B
C
D
E
F
PLAN DRAWN BY : PAUL McILRATH
STRUT LOCATION
TOP
BOTT
WHEELS & PANTS ARE FOAM
RIBS FOR TOP WING
USE SAME TEMPLATE TO CUT ALL RIBS
W
X
Y
Z

ULTRA-FILM COVERING TIPS

ROGER SCHROEDER

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

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

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

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

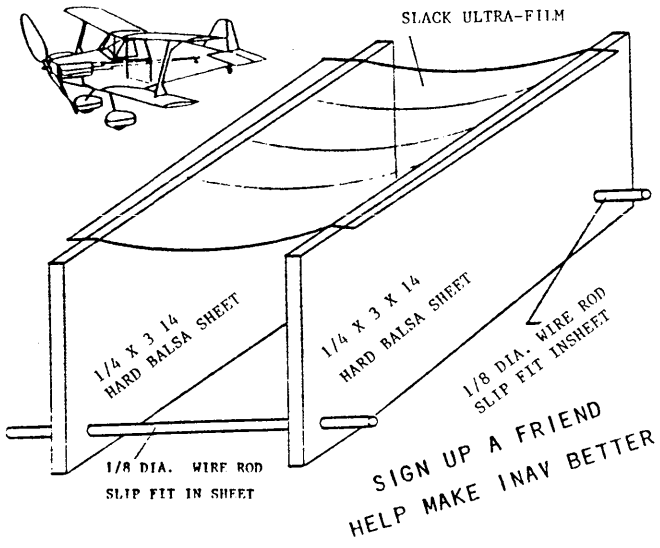
The film needs to be transferred to the frame. Adjust the wires of the frame so the frame width is about 1/2 in. less than the length of the cut film/newspaper laminate. 3M contact spray is the best for sticking film to the frame. Lightly spray the top edges of the frame, remove the top sheet of newspaper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

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

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

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

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



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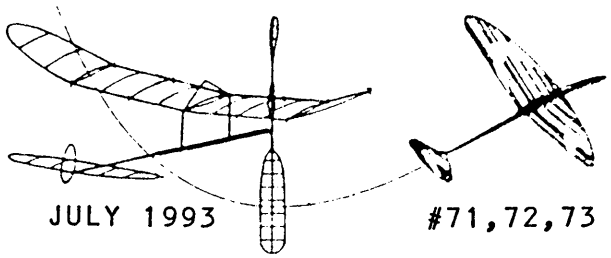
One billion gallons of gas per year would be saved if all US autos used the minimum octain gasoline recommended by their automobile manufactures. Most cars don't increase their mileage or performance with high octane fuel. More crude oil is required to refine high octane gas than standard 87 octane gas.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

INDOOR
NEWS and VIEWS



JULY 1993 #71,72,73

EDITOR: Plenny J Bates 2505 White Eagle TRL SE, Cedar Rapids IA 52403. Voice: 319-362-2969
NEW EDITOR: Lester W Garber 2324 E 5th ST, Duluth MN 55812. Voice: 218-728-6827
Fax: 218-728-6841

DON LINDLEY

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

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

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

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

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

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

Hey old tiger ! -- until next time !

As ever,

Jim Clem

DON LINDLEY

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

Plenny J Bates

NOTE: As of NOW your editor is Les Garber. His address is above.

MIAMA GRAND PRIX

Results from Doc John Martin

COCONUT SCALE 13 entries

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

* Tie broken by lowest static score

COCONUT MASS LAUNCH 12 flew

1 Eggert 2 Blair 3 Rees

PISTACHIO SCALE 21 entries

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

PEANUT SCALE

		subject	
1	Ganser	Volsin Hydro	209.5
2	McGillvray	Isaac's Fury	207.0
3	Miller	Volsin Hydro	204.0
4	Bourke	Farman Moustique	176.5
5	Weckerly	Waco E float	172.5
6	Eggert	Fokker D-7	168.0
7	Hines	Heinkel HE 100V	159.0
8	Martin	Goldwing	152.0
9	Fink	Fokker DVII	151.5
10	Fink	Avia Racer	145.0
11	Thompson	Lacy M 10	133.0
12	Buxton	SE5A	126.0
13	Sanders	Cougar	115.5
14	Grant	Sperry Messenger	108.0
15	Stevens	Cougar	90.0
16	Sydor (JR)	Jodel	73.8

KIT / PLAN SCALE

		subject	
1	**Rees**	**Zippy Sport**	**261**
2	**Blair**	**Taylor**	**255**
3	**Eggert**	**Puss Moth**	**252**
4	**Konefes**	**Found (Centennial)**	**240**
5	**Martin**	**Farman**	**195**
6	**McIlrath**	**Mr.Mulligan**	**155**
7	**Miller**	**Howard DGA**	**103**
8	**Boone**	**Boeing F4B4**	**86**
9	**Boyles**	**Fokker DVII**	**65**

NO-CAL SCALE

		time
1	Loucka	6:40
2	Slusarczyk,C	6:29
3	Obarski	5:23
4	Henderson	5:19
5	Robelen	5:11
6	Ganser	5:07
7	Garber	5:03
8	Eggert	4:43
9	Baird	4:41
10	Bourke	4:16
11	Marett	4:15
12	Romash	4:12
13	Voorhees	4:09
14	Coslick	4:02
15	Buxton	4:01
16	Leifer	3:58
17	Warmann	3:44
18	Stonecipher	3:24
19	Von Bueren	3:20
20	Kinefes, E	2:56
21	Barry	2:39
22	Konefes, J	1:57
23	Diebolt	1:52
24	Van Dover	1:34
25	Nuszer	1:24
26	Campbell	1:19

DNF Sanders-Martin-Klintworth-Fellin-Plassman,G-Knight-White-Vancil-Eberle(SR)-Sydor(JR) Forward(JR)

BOSTONIAN

		time 2	clarisma best	total
1	Miller,R	545	1.14	621.30
2	Buddenbohm	501	1.16	581.16
3	Boyles	485	1.18	572.30
4	Coslick	472	1.14	538.08
5	Avery	442	1.18	521.56
6	Marett	451	1.09	491.59
7	Blair	394	1.15	453.10
8	Ganser,R	396	1.09	431.64
9	Weckerly	363	1.09	395.67
10	Barker	316	1.17	369.72
11	Thompson	331	1.10	364.10
12	Robelen	303	1.10	333.30
13	Phillips	299	1.03	307.97
14	Fink	274	1.09	298.66
15	Peterson	244	1.12	273.28
16	Konefes,E	244	1.10	268.40
17	Sanders	200	1.08	216.00
18	Konefes,S	151	1.08	163.08
19	Van Dover	127	1.08	137.16
20	McIlrath,PN	99	1.18	116.82

DNF Henderson-Ganser,J-Nuszer-Buxton-Smith-Martin-Obarski-Knight-Hartman-Thomson-Plassman-Plasserelli-Sullivan,E-Grant-Pavek-Stevens-Barry.

INTERMEDIATE STICK

Junior

1	Sydor	6:10

Senior

1	Linardic,V	9:41
2	Eberle,R	7:36

Open

1	McGillivray	30:28
2	Hunt	29:58
3	Belieff,D	29:14
4	Loucka	27:59
5	Chilton	27:52
6	Iacobellis	27:03
7	Coslick	26:28
8	Barr,L	25:27
9	D'Alesandro	24:01
10	Henderson	23:46
11	Burke,E	23:36
12	Ganser	23:35
13	Barker	23:29
14	Grant	23:00
15	Obarski	22:46
16	O'Grady	22:45
17	Underwood	22:39
18	Williams,W	22:07
19	Shepherd	21:58
20	Thompson,M	21:23
21	Marett	21:09
22	Eggert	20:37
23	Vallee	19:29
24	Krush	18:05
25	Buxton	18:03
26	Hacker	17:59
27	Nuszer	17:35
28	Tenny	13:43
29	Jones,Ray	10:35

DNF-Triolo-VanGorder -Wrzos-Archibald-Slusarczyk,C-Jones,J Slusarczyk,D

AMA RUBBER SCALE

		subject	
1	**Blair**	**Georgia Special**	**180**
2	**McGillvary**	**SE5 Replica**	**174**
3	**Rees**	**Martynside "Buzzard"**	**170**
4	**Passarelli**	**Nesmuth Cougar**	**166**
5	**Nuszer**	**Cessna 1911**	**157**
6	**Hines**	**Curtiss Robin (Corrigan)**	**122**
7	**Miller,J**	**Voison Hydro**	**89**
8	**Martin**	**LePelican Ultralite**	**86**

PEANUT SCALE

		subject	
1	Ganser	Volsin Hydro	209.5
2	McGillvray	Isaac's Fury	207.0
3	Miller	Volsin Hydro	204.0
4	Bourke	Farman Moustique	176.5
5	Weckerly	Waco E float	172.5
6	Eggert	Fokker D-7	168.0
7	Hines	Heinkel HE 100V	159.0
8	Martin	Goldwing	152.0
9	Fink	Fokker DVII	151.5
10	Fink	Avia Racer	145.0
11	Thompson	Lacy M 10	133.0
12	Buxton	SE5A	126.0
13	Sanders	Cougar	115.5
14	Grant	Sperry Messenger	108.0
15	Stevens	Cougar	90.0
16	Sydor (JR)	Jodel	73.8

USIC/NATS 1993

FILE: USICEZB.93

Easy B

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

DNF Archibald - Brown Campbell - Couture - Forward - Grubbs - Hacker - Loucka - Mzik - Nuszer - Radoff - Slusarczyk,D Thomson - Williams,W

HAND LAUNCH GLIDER

		Time
1	Buxton	149.0
2	Boehm	147.4
3	Thompson	138.6
4	Kimball	122.8
5	McIlrath P J	118.8
6	Buddenbohm	113.7
7	Romash	111.3
8	Plassman	106.0
9	Von Bueren	103.6
10	Peterson	91.5
11	Jessup	89.9
12	Slusarczyk C	81.5
13	Belieff	79.8
14	Stevens	57.0

DNF- Schlarb,W - Shepherd - Hartman - VanDover

SR

Plassman 93.3

JR

Sydor 87.2

FEDERATION R.O.G.

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

MANHATTAN CABIN

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

DNF Plussman - Green Slusarczyk,D and C

FILE:USICROGC.A93

R.O.G. CABIN

1	Ganser	27:00
2	Luocka	24:33
3	Belieff	21:49
4	Iacobellis	17:46
5	D'Alessandro	17:14
6	Krush	16:46
7	Williams	16:28
8	Marett	13:31

DNF Slusarczyk - Vallee - Hacker

FILE: USICHLST.93

HAND LAUNCH STICK

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

DNF Landrum - Louka

35 CM MICROFILM

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

SENIOR

1	Eberle	10:22

CATAPULT GLIDER

		Time
1	Plassman	162.8
2	Thompson Mike	162.5
3	Sclarb W	161.4
4	Warmann	159.0
5	Sclarb R	158.7
6	Fulmer	156.8
7	Boehm	152.7
8	Nolin	152.1
9	Belieff	151.5
10	Garafolo	150.7
11	Vancil	147.6
12	Von Bueren	146.3
13	Koneffs E	145.2
14	Buddenbohm	138.0
15	Person	137.0
16	Buxton	133.0
17	Greene	123.7
18	Wisniewski	121.0
19	Rash	114.4
20	Garber	113.0
21	Peterson	108.5
22	Konefes J	106.9
23	Jessup	104.0
24	Radoff	102.0
25	Romash	96.8
26	Weckerly	96.4
27	Sydor (JR)	92.6
28	McIlrath P J	91.1
29	Triolo	88.6
30	Leonard (SR)	83.2
31	Plassman (SR)	79.5
32	Vancil	73.2
33	Forward (JR)	32.5

DNF Shepherd - Wrzos - McIlrath P N - Diebolt Tenny - Doig - Thomson Landrum - Plassman - Italiano - Sanders - Klintworth - Culpepper

USIC GRAND CHAMPION

1	**McGillivary**	**632.3**
2	**Ganser**	**614.2**
3	**Coslick**	**580.7**
4	**Marett**	**534.0**
5	**Grant**	**497.5**
6	**Williams**	**451.6**
7	**D'Alessandro**	**445.3**
8	**Krush**	**442.1**
9	**Vallee**	**412.2**
10	**Eggert**	**320.4**
11	**Slusarczyk**	**288.8**
12	**Shepherd**	**250.4**
13	**Hartman**	**236.6**

Junior

1	**Linardic**	**342.3**
2	**Forward**	**36.4**

FAC GOLDEN AGE

C.D. Jim Miller total 3 flts

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

FAC Hi-Wing Monoplane

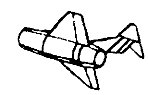
C.D. Jim Miller

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

FAC WWI COMBAT 3 rounds

C.D. Jim Miller

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



FAC BIPLANE

C.D. Jim Miller

		flt	scale	Total
1	Doc Martin- Astra	77.5	47	124.5

FAC SCALE

C.D. Jim Miller

		bonus	flt	scale	Total
1	Passarelli- Couger	0	82.5	56.5	139
2	Wickerly- Found/floats	15	56	52.5	123.5
3	Hines- Lippisch P-13	15	34	52	101

Rees- Martinsyd Buzzard
Rees- Fiesler Storch
Blair- Cessna C-34
J. Miller- Voisin

FAC PEANUT

C.D. Jim Miller

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

****

FAC AT JOHNSON CITY

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

****

UNLIMITED SPEED

		time
1	Coslick	7.10
2	McIlrath,PJ	7.48
3	Plassman	9.66
4	Person	11.30

Did not complete course-Thompson-Hacker-Eberle-Doig-McIlrath,PN-Forward Jr.

PEANUT SPEED

		time
1	Vandover	14.20
2	Konefes,J	19.87
3	Sydor (JR)	21.00

DNF-Thompson- No official-Samplers

ORNITHOPTER

		time
1	White	13.01
2	Krush	9.13
3	Williams,W	8.33
4	Stonecipher	3.27

DNF-Coslick-McIlrath,PN

HELIOCOPTER

		time
1	Williams	6.11
2	Vallee	5.50
3	Ganser	5.21
4	Diebolt	2.51
5	Rash	2.46
6	Stonecipher	1.58

DNF-Peterson
Forward (JR) 1.12
DNF-Eberly (SR)

MORE USIC/NATS 1993

PENNYPLANE

1	Wisniewski	16:11
2	Bourke	15:45
3	Henderson	15:37
4	Coslick	15:32
5	Slusarczyk,C	15:28
6	Hardcastle	14:33
7	Hartman	14:11
8	Clem	14:00
9	Warmann	13:59
10	Iacobellis	13:43
11	Nuszer	13:35
12	McGillivary	13:17
13	Marett	13:12
14	D'Alessandro	13:09
15	Vancil	12:17
16	Phillips	12:15
17	Garber	12:09
18	Romash	12:08
19	Barber	12:02
20	Ganser	11:57
20	Radoff	11:57
21	Hacker	11:55
22	Boone	11:41
23	Krush	11:18
23	Vallee	11:18
24	Mzik	10:56
25	Buxton	10:41
26	Konefes,E	10:26
27	Eberle,B	10:09
28	Sullivan,E	9:59
29	O'Grady	9:54
30	Fellin	9:52
31	Zufelt	9:49
32	Landrum	9:33
33	Italiano	8:47
34	Jones	8:39
35	Grant	7:52
36	Grubbs	7:20
37	Wrzos	7:17
38	Gaertner	6:29

DNF Jones,J - Ganser,J - VanGorder - Thompson - Geyer - Nelson - Green Plassman - Barry - Ripley - Slusarzyk,D - White

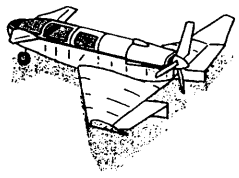
SENIOR PENNYPLANE

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

JUNIOR PENNYPLANE

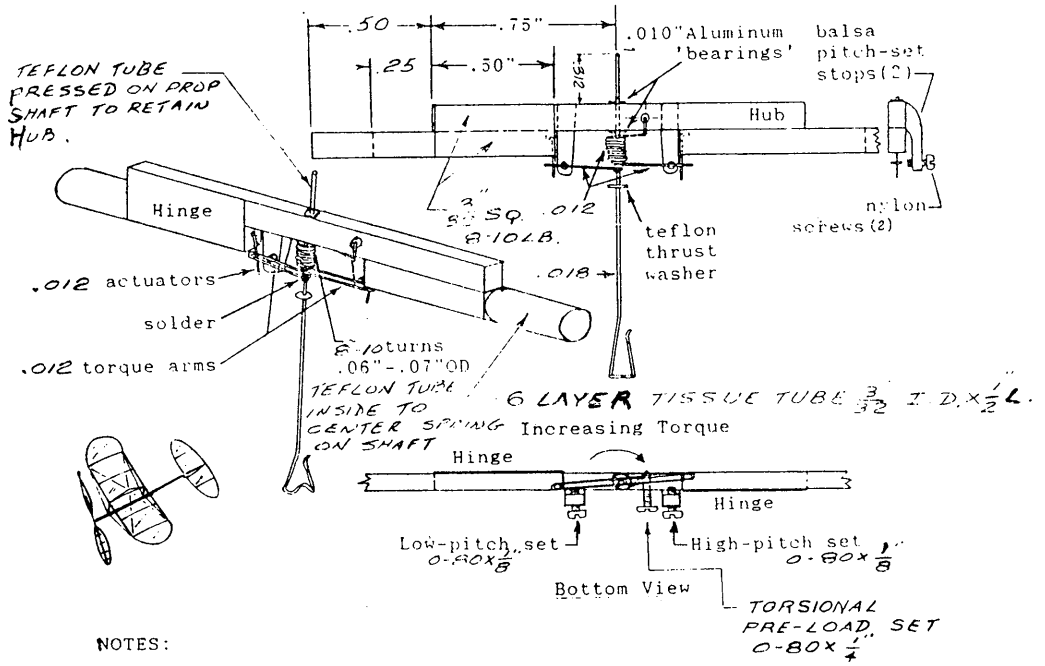
1	Sydor	10:37
2	Forward	2:40

4 FREE F'LL SIZED PLANS IN THIS ISSUE



ADJUSTABLE VARIABLE PITCH PROP
by Cezar Banks
July'90

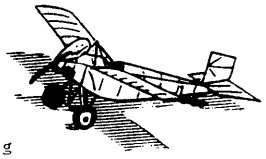
V.P. PROP MODIFIED FOR P.P.
BY JIM CLEM
JUNE '92



NOTES:

Hinges are iron-on Monokote or Micafilm.
Ends of nylon screws act as adjustable stops to rotation of torque arms.
0-80 Nylon screws are available from:
Small Parts Incorporated
6901-N.E. Third Avenue
P.O. Box #381736
Miami, Florida 33238-1736
Ph. 1-305-751-0856
Threads in balsa stops are 'cast' out of cyano using 0-80 steel machine screw as a mold. Force screw it out when cyano has 'set'.
Torsional pre-load on spring determines when 'switchover' starts. I try for 2⅔-4 minute mark. To adjust, bend free end of spring or add shims where spring end is glued to hub. Transition time to reach low pitch stop is determined by number of coils and coil diameter.

NOTE: BE SURE AND REVIEW BOB RANDOLPH'S ARTICLE "TOP CAT 90L-1" IN THE SEPTEMBER 1991 ISSUE OF MODEL AVIATION



TOM VALLEE AND JIM CLEM V.P. PROPS

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

Tom Vallee
444 Henryton So
Laurel MD 20724

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

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

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

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

DOUBLE WHAMMY FULL SIZED PLAN THIS ISSUE

4 FREE FULL SIZED PLANS IN THIS ISSUE

DOUBLE WHAMMY

Chuck Marcos

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

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

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

LAKEHURST FLYING 1993

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

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

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

****

MACE MODEL AIRCRAFT CO.

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

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

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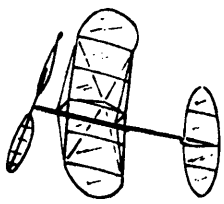
PECK-POLYMERS NEW CATALOG

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

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

Phone: 619-448-1818

FAX: 619-448-1833



They Take Visa, Master Card, and Am. Express

FINDING A SITE - IT IS EASY

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

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

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

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

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

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

Happy Rafter Banging,

Michael Spiess
225 Pine
St Peter MN 56082-2226

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

Get a local site. GET A LOCAL SITE. It can be done most anywhere. It may take several attempts at several places but it can be done. This is not only for your new flyers but is for you as their numbers may be needed to get the site. The person who controls the use of the hall you want thinks of a model airplane as a thing with a chain saw engine on the front. So do not forget to take a ready to go model (as a LPP and / or scale) to demonstrate. At present the AMA does not have a packet for getting an indoor site but Doc Martin has some material that may be of use. The AMA can be a big help if the site owner wants proof of financial responsibility and your group members belong to AMA. This got the indoor flyers in Des Moines a site. Expect to pay a fee for use of most sites.

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

****

Covering with Ultra-Film
By Bob Randolph

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

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

****

STARLINE INTERNATIONAL

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

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DOMEDUSTER PLAN PACKET No. 2

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

Address: Stan Fink
1810 Pine ST
Philaladelphia PA 19103

Phone: 1-215-732-5014

SOURCES FOR SMALL DIAMETER REAMERS

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

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

Paul McIlrath

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

FROM: SAM 86 SPEAKS

STORING RUBBER MOTORS

by Bill Henderson (from the MAAC mag)

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

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

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

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

Since the unmodified polyethylene and polypropylene are lighter than water (S.G. 0.92-0.97) and PVC is heavier than water (S.G. 1.2 and higher) then the following method will tell you what you have. Take one of the bags, open it up and fill it completely with water. Now put the full bag, with open edge up, into a deep pan of water and pull it to the bottom. If it stays there it is PVC or a modified polyethylene/polypropylene, and do not use for rubber storage. If it slowly rises to the surface of the water it is unmodified polyethylene or polypropylene and is OK to use for rubber storage.

FROM: SAM 86 SPEAKS

USING DOUBLE TISSUE

from Alt Vogelman

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

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

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

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

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

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NEW 98 FOOT SITE ?

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

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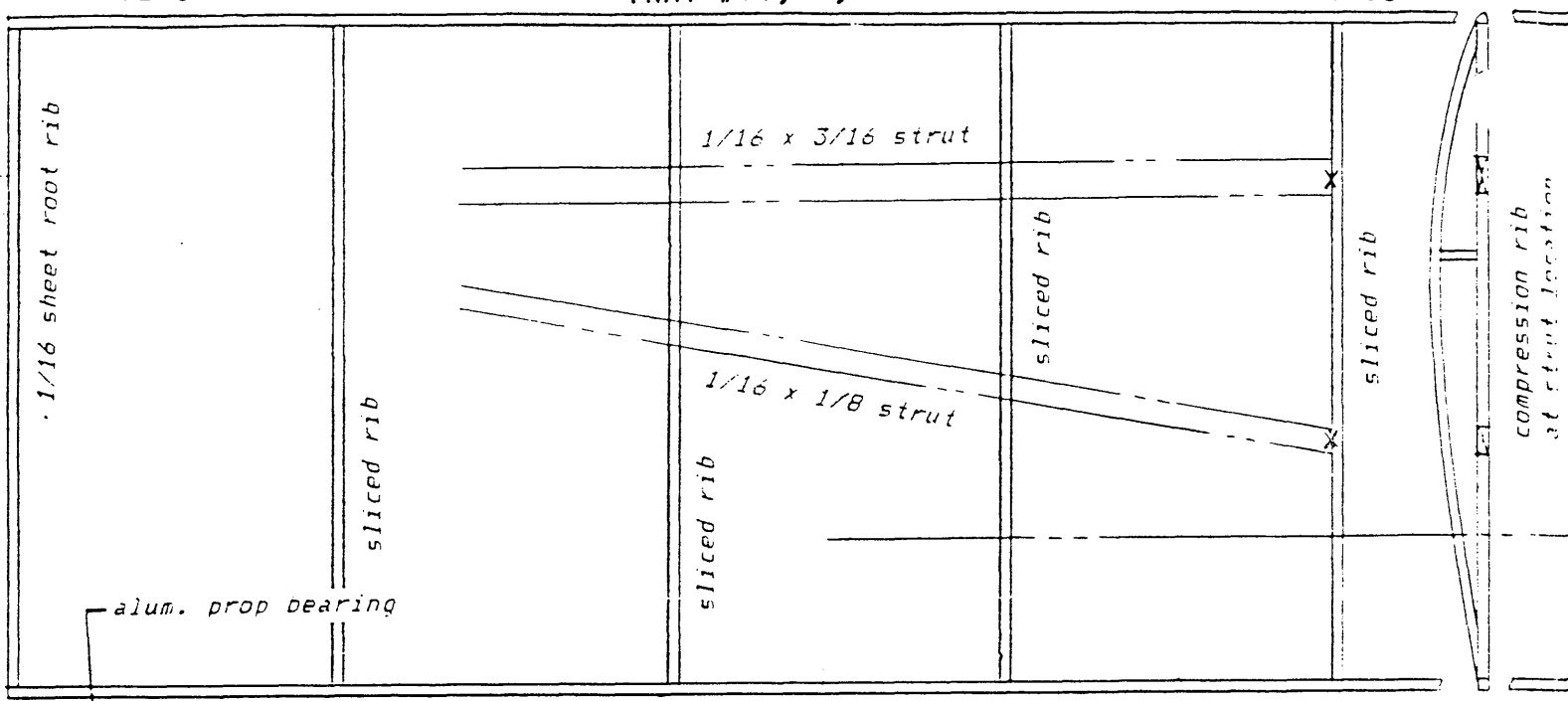
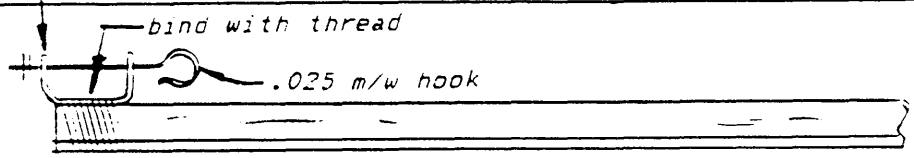
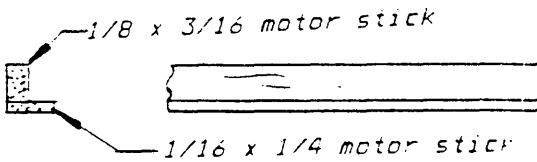
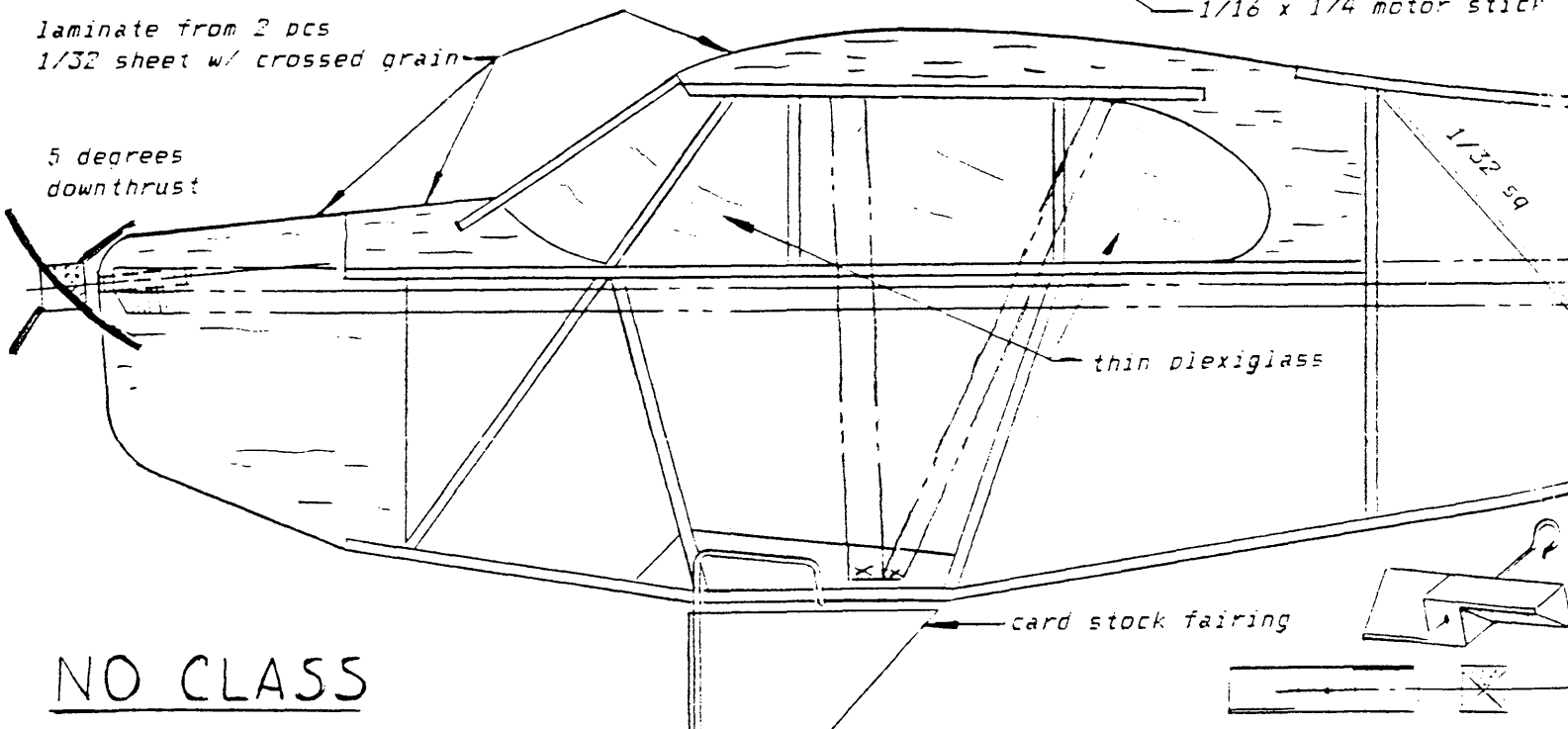


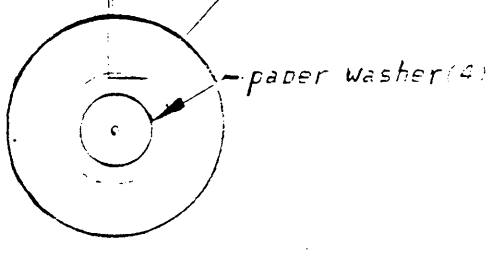






NO CLASS
NO CAL CUB

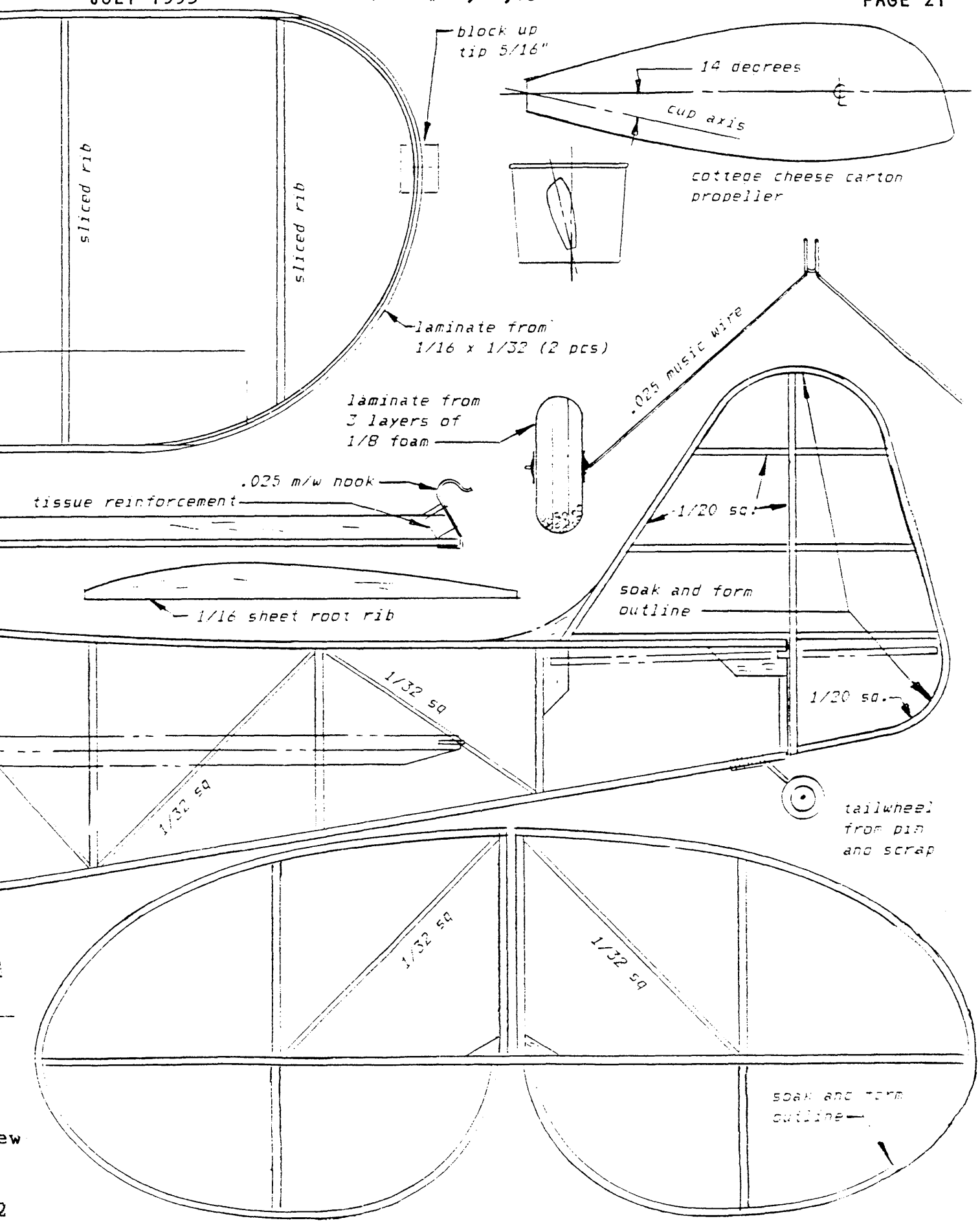
L. SATTERLEE 2/18/91



propeller hub
1/4 sq x 1"

All material 1/16" sq unless otherwise specified

FROM: Indoor Flight Revi
Editor: Jack Textor
29 SW 58 TH DR
Des Moines IA 5031


block up tip 5/16"
14 degrees
cup axis
cottege cheese carton propeller
sliced rib
sliced rib
laminate from 1/16 x 1/32 (2 pcs)
.025 music wire
laminate from 3 layers of 1/8 foam
.025 m/w nook
tissue reinforcement
1/20 sq.
1/16 sheet root rib
soak and form outline
1/32 sq
1/32 sq
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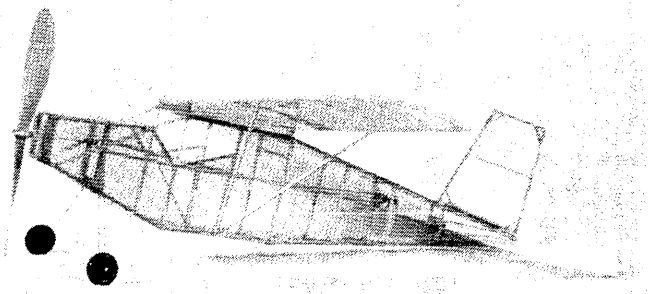
tailwheel from pin and scrap
1/32 sq
1/32 sq
soak and form outline



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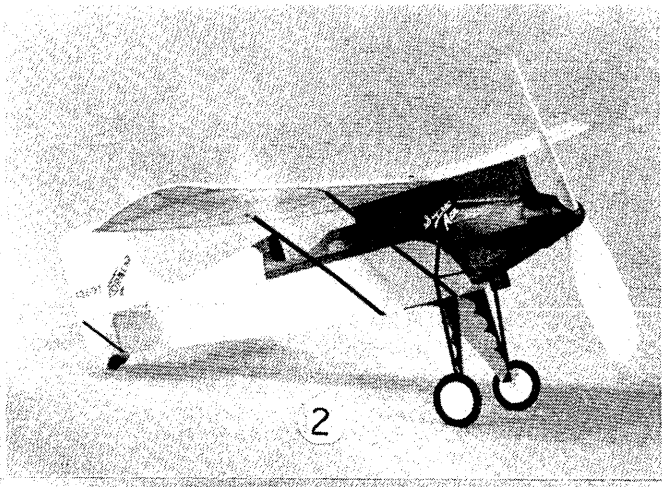

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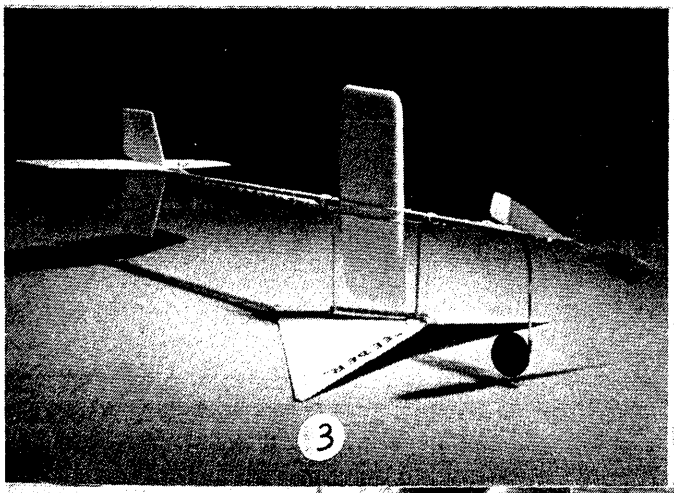

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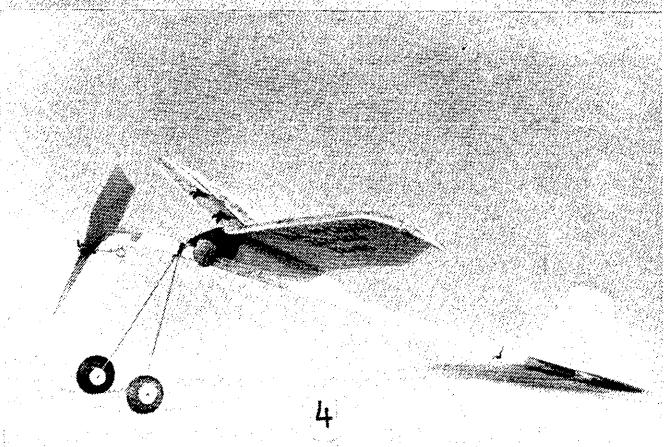

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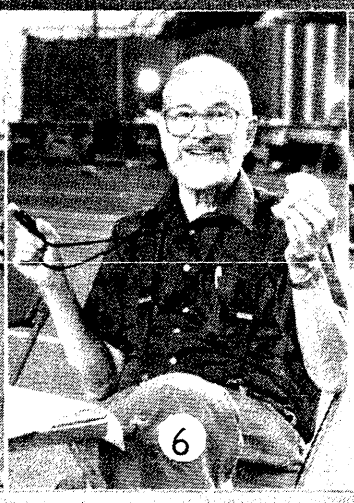

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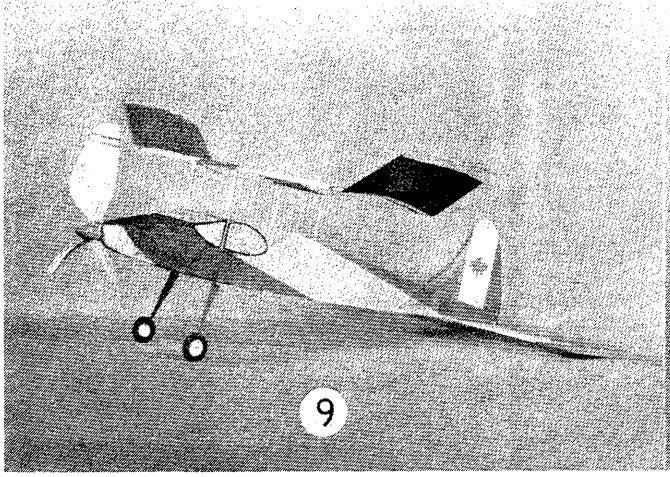

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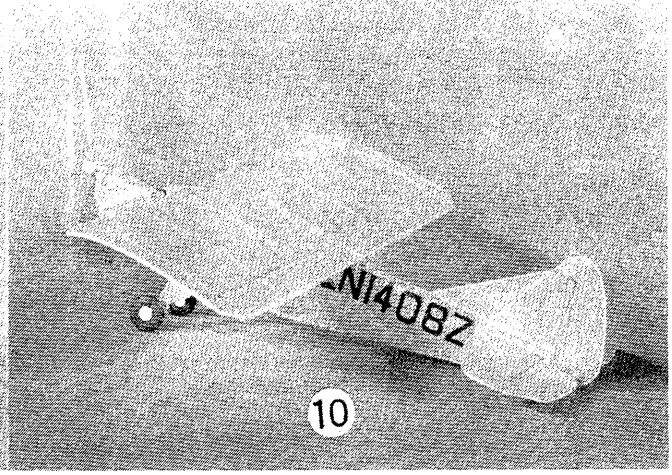

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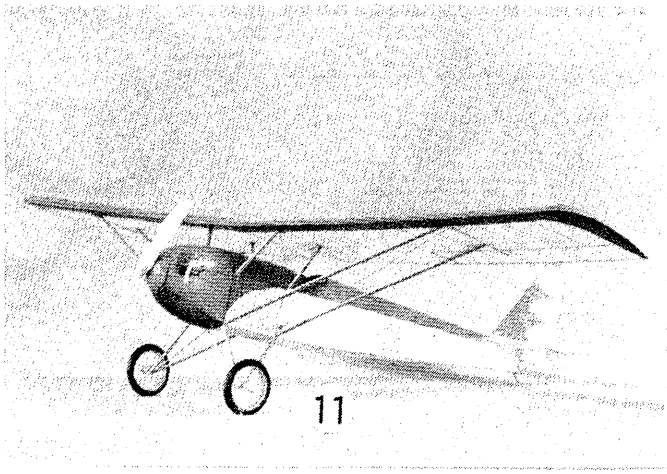
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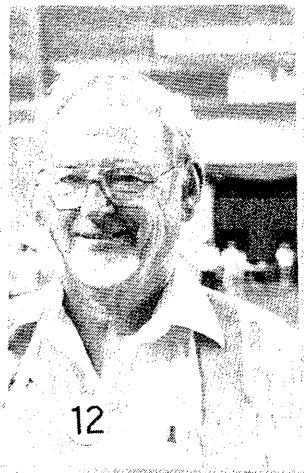
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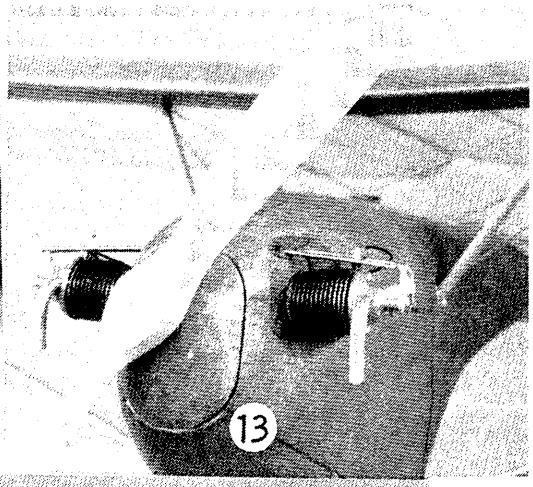
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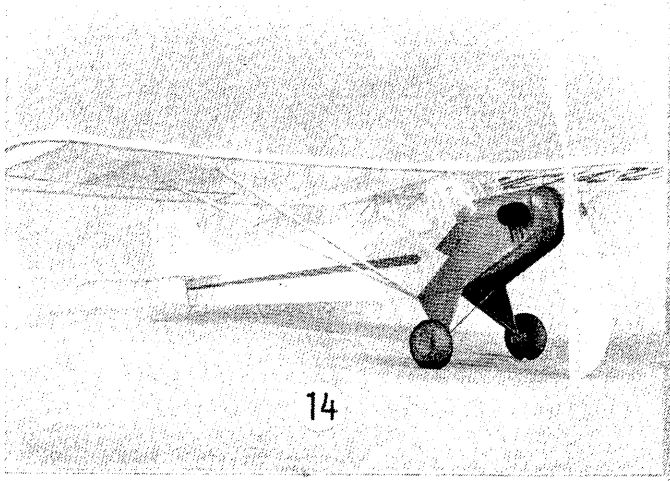
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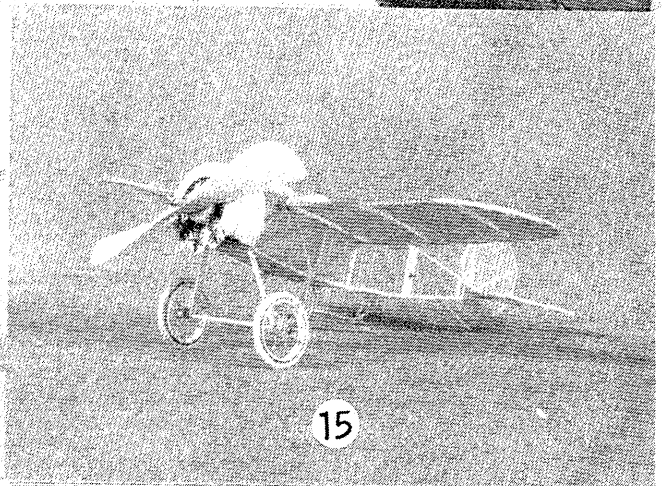
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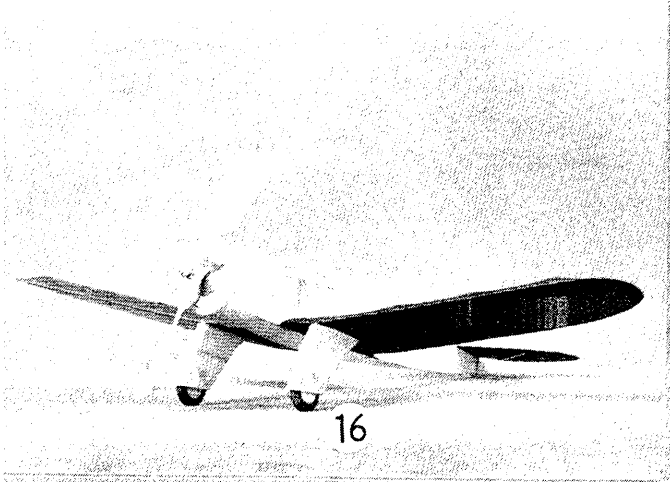
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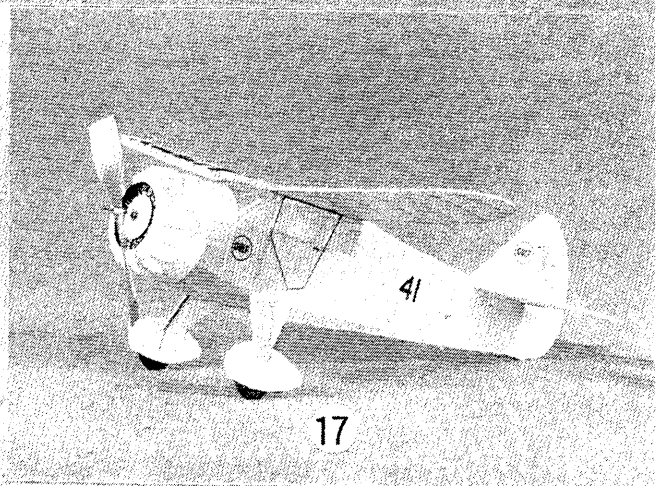

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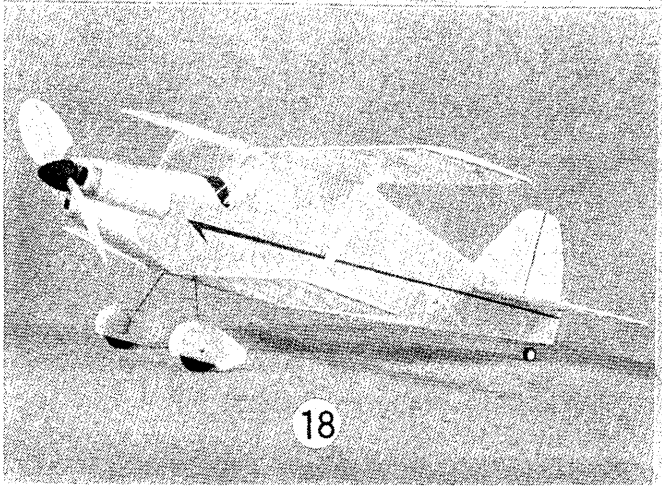
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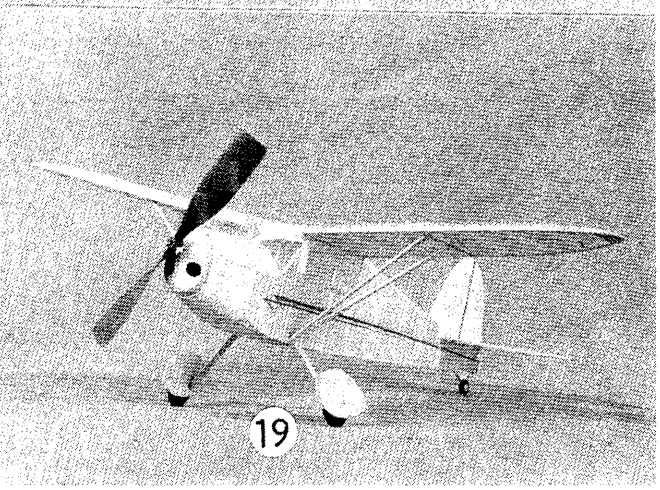
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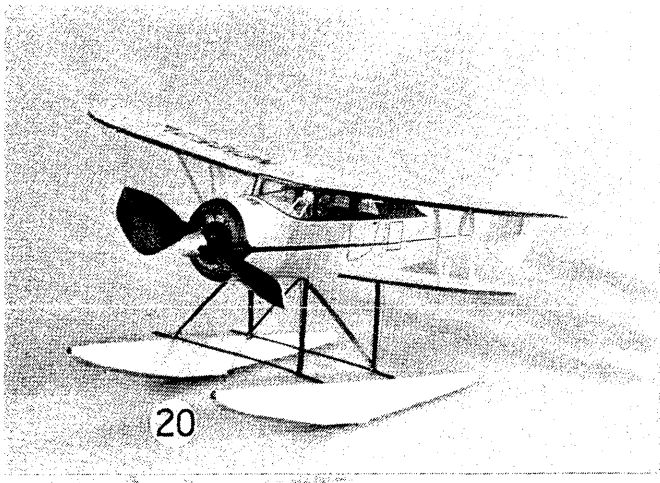
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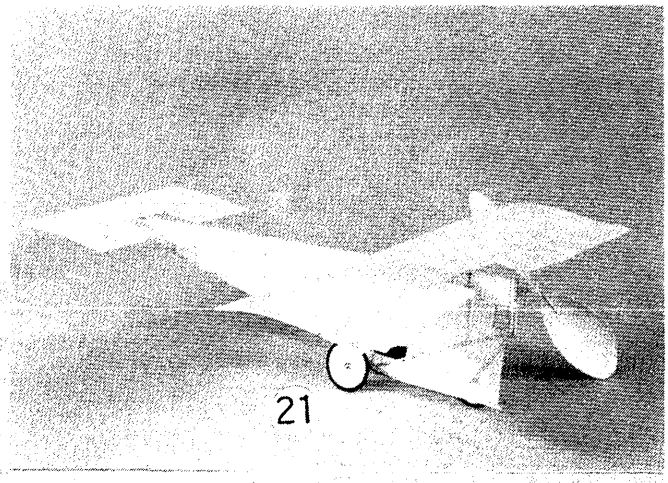
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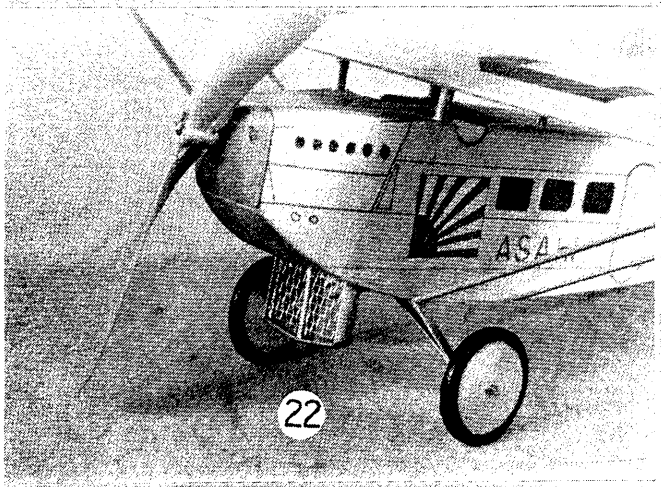
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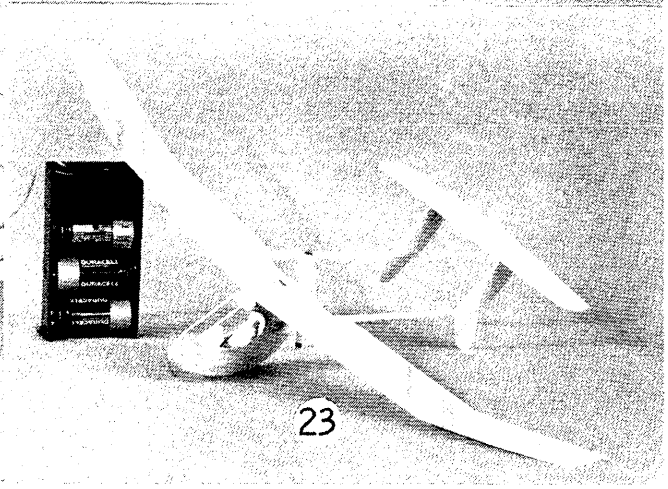
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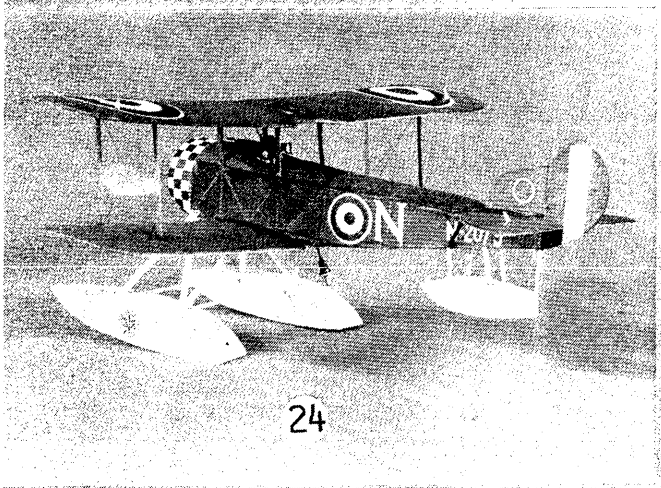
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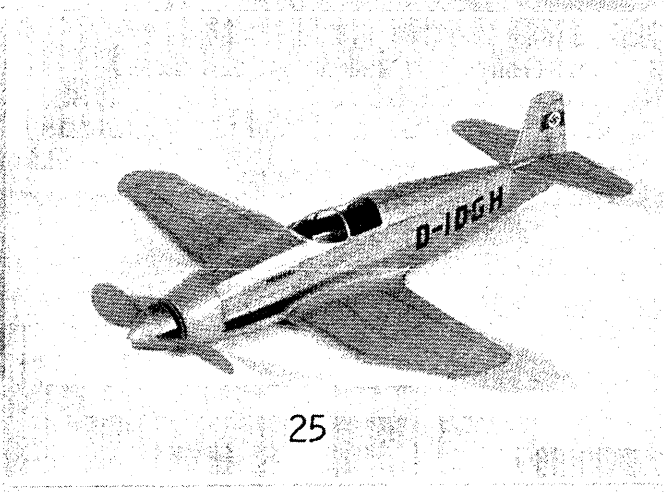
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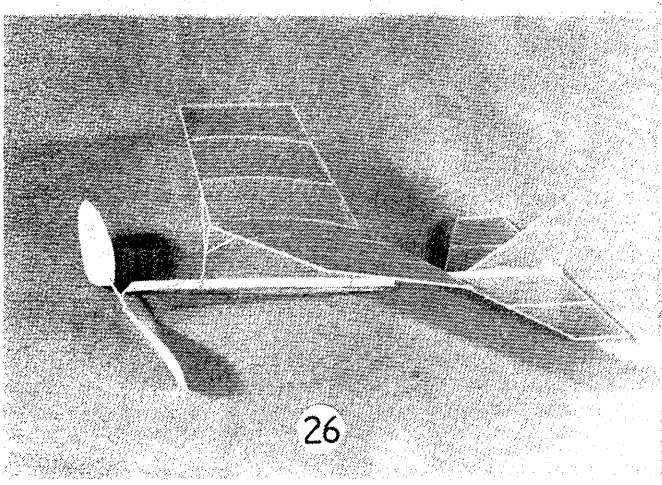
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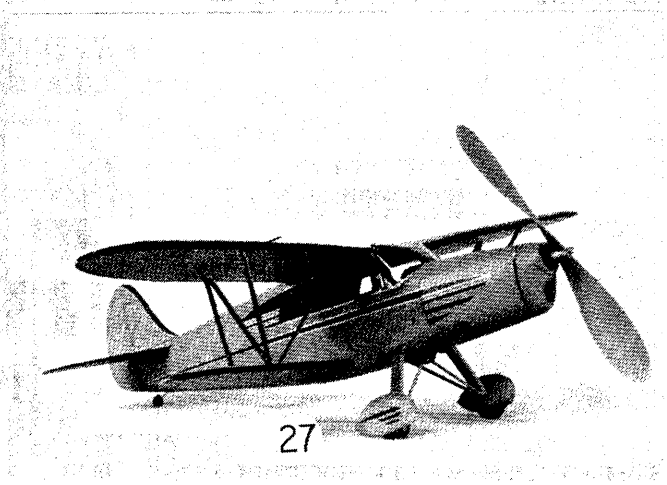
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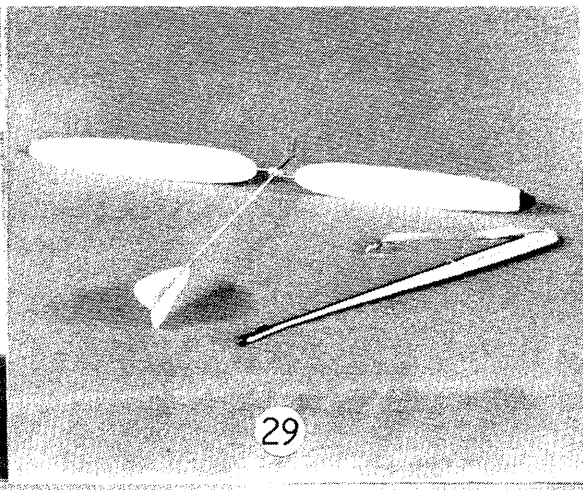
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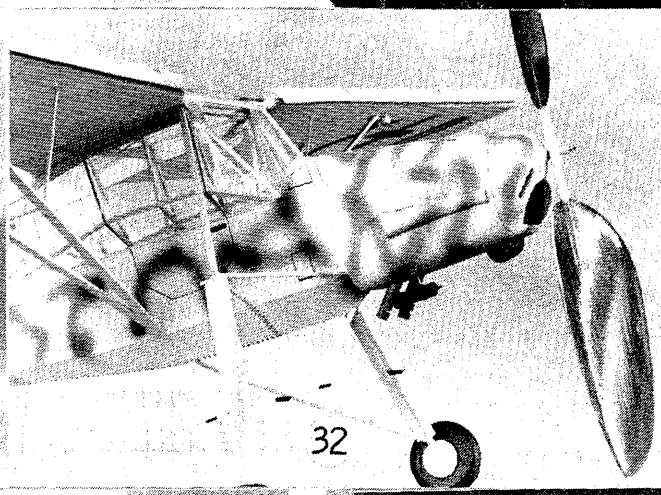
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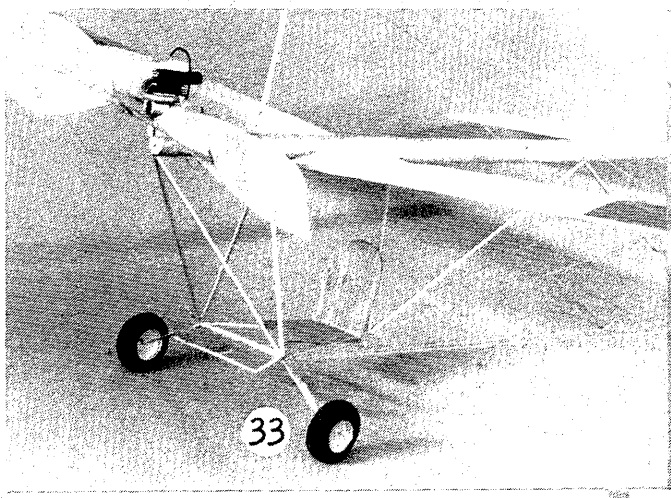
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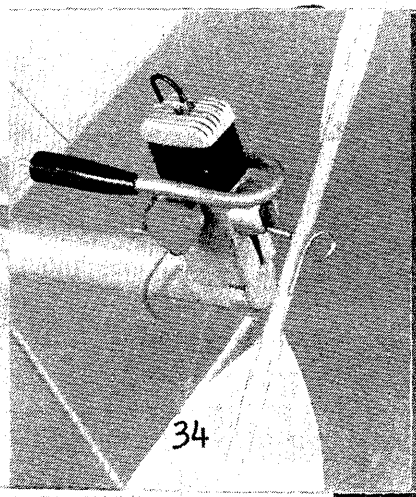
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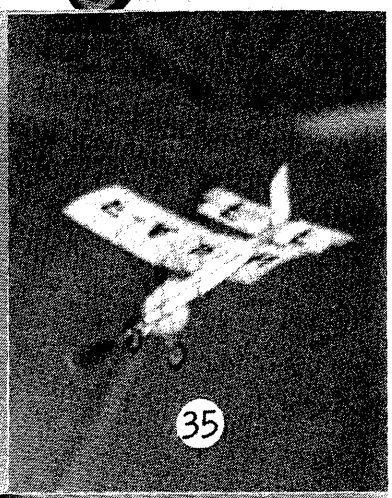
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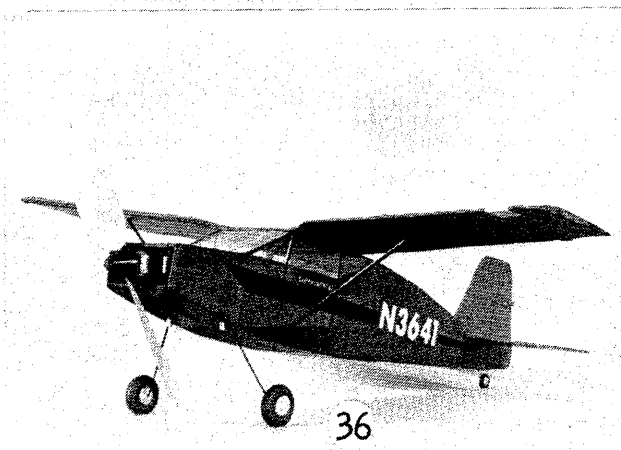

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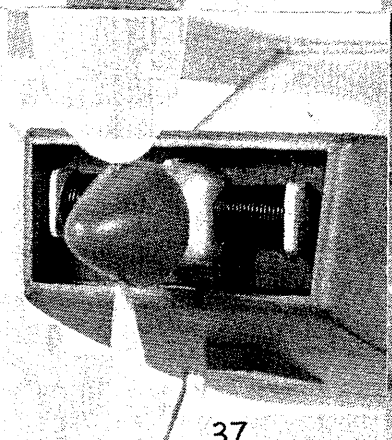
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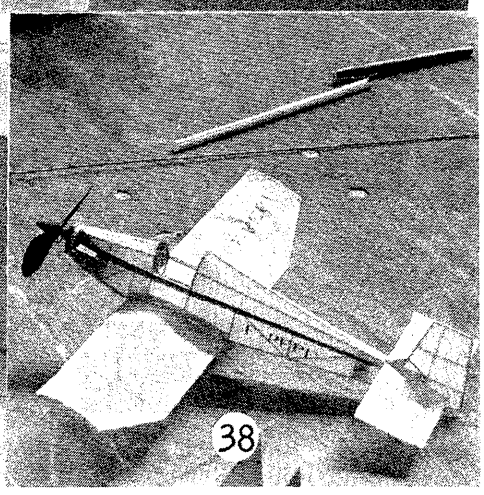
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PHOTO INFORMATION (AS SEEN AT USIC/NATS '93)

(1) Donald Lindley's BEAN MACHINE from plans April 1992 INAV. This one by Ed Seay Sr covered with colored Reynolds wrap which shows the "bones."
Now a kit by: Model Aircraft Labs
108 Lee ST
(Telephone) Irving TX 75060
(214-438-9233)
Write or call Ed about the kits and the use of Reynolds wrap. The late Don Lindley designed this Bostonian to be simple to build to the minimum weight, as a result is a good flyer even in beginner's hands.

(2) CORBIN SUPER ACE Kit/Plan Scale by Plenny J Bates. Not flown "official." Unofficial 1:54 which shows a clean, new, and neatly constructed model from the Golden Age kit would have a good chance in the K/P Scale event. This G.A. kit was recommended by my friend Don Lindley. It proved to be a fine kit and a good flyer.

(3) SKIMMER speed model by Paul N McIlrath. Based on research of Dr. Alexander Lippisch in effort to develop fast fuel efficient craft for use on and over water. Man carrying prototypes were very fast and fuel efficient for the power used. Model's large vertical fin is to permit a tight turn without banking. The speeds were high but Paul was unable to get in a clean two laps without touching the floor.

(4) FOAM RACER unlimited speed model by Paul J McIlrath. Took a second place and had the perennial winner of the event Larry Coslick bested until the last five minutes of the event. Your ever faithful editor attended USIC/ NATS '93 with Paul N (senior) and Paul J (the younger) McIlrath and they both helped with results copying and picture taking.

(5) Paul J McIlrath and speed model.

(6) Tom Vallee CD and timer for Speed events.

(7) Larry Coslick Unlimited Speed winner second year in a row.

(8) Marie Rees the brains behind HiLine electric motors at her display. Dave was busy as usual winning more than his share of scale events. Write to them at:
HiLine
P O BOX 11558
Goldsboro NC 27532
They have a nice line of electric motors and accessories for electric. Cannot remember information pack cost but bet a $1.00 bill and a SASE will get you all the information you need.

(9) BOSTONIAN PATRIOT by John Marett of Canada. This was one of the first three Bostonians to exceed 4 minutes. John has been flying indoor since '83 or '84 and was Grand Champion USIC 1990.

(10) FIKE No-Cal Scale by John Marett won first place USIC '87 and flown in every one since. Plan in "Winning Indoor Designs" by Jerry Nolin and Ed Knight. As permitted by rules a number of changes from true scale were made to improve flying - Wing cord slightly reduced, Tail area slightly increased, Tail and Nose moment slightly increased.

(11) Georga Special by John Blair. First in AMA scale. Plan drawn from EAA reprint of 1931 Flying and Glider Manual. 1" to 1' for a 28" wing span.

(12) John Blair Scale builder extraordinary !

(13) Georga Special detail of 28 H.P.Morehouse engine. It is easy to see why it took first.

(14) Taylor E 2 Cub Kit/Plan Scale John Blair. Megow plan from Schultz. 23.5" span. Took second place to Rees Zippy Sport
Plan source: Charles F Schultz
910 Broadfields DR
Louisville KY 40207
Send him a SASE and $1.00 for list.

(15) Herbst Monoplane by John Blair. Walt Mooney peanut plan reduced to Pistacho. Wire wheels per John Typond in Model Builder.

(16) Kinner Sportwing Kit/Plan Scale by John Blair

(17) Mr Mulligan Bostonian by Paul N McIlrath High charisma points but came in last over all. But still a good smooth flyer and does it ever look good.

(18) Shatzie by Paul J McIlrath. Design by Paul N McIlrath, plan in April 1993 INAV.

(19) 3/4 Sig Cabinaire by Paul J McIlrath. Design by Paul N McIlrath

(20) Waco E Model E floatplane by Stu Weckerly. Plan written in German with Ken Johnson's name on them. Stu added the Edo floats. Peanut Scale fifth place great for such a difficult subject.

(21) White Monoplane No-Cal by Dan Baird took 5 th place with a 4:41. From Peanut plan (enlarged to 123%) in Model Builder Oct. 1983 - Don Assel.

(22) J-BADA Dornier built in Japan. Model by Gil Coughlin. Radiator is aluminum screen. Plan to be in Model Builder a Linstrum design.

(23) A "Could Be" ultra light by Robert Romash. All sheet balsa surfaces and Kenway electric power. A good sport flyer and all you need for field equipment is the 3 D cell charger shown with the model. Would be a great construction feature for Flying Models, Model Builder or Model Aviation.

(24) Sopwith Baby CO 2 by Michael Hines.

(25) Heinkel HE 100 V8 Peanut Scale by Michael Hines. Took a 7 th which was good for a complex low winger.

(26) TATA SMOULA kit from Czechoslovaka is like a limited pennyplane but as close as you will come to an ARF in an indoor

CONTINUED ON PAGE 16

CONTINUED FROM PAGE 15

model. Kit has ribs cut, motor stick with bearing and rear hook attached and the prop is ready to slip together. Could be used in one design contest or as a quick built model to demonstrate in effort to get a site. A Hobby Lobby import this example built by Michael Hines.

(27) Waco C8W by Michael Hines. A one of a kind built for Menasco and powered by their engine. Later owned by Howard Hughes.

(28) Les Garber. The editor of INAV after this issue. Things can only get better for the readers.... not Les.

(29) A catapult autogyro by Les Garber. There is no class for this but it is sure fun to watch it rocket up with folded blades and then come rotating down.

(30) Kit Underwood one of the people who make Indoor. She puts a lot of effort into the Lakehurst flying. If you think you would like to fly at Lakehurst contact Kit and Gary at: 9 Treelawn Terrace
Mercerville NJ 08619
(Telephone 609-586-4441)

(31 & 32) Storch by Dave Rees loaded with detail all done to perfection.

(33 & 34) Sky Rider ultralight by Dave Robelen 40" span and only 35 grams. The struts are all balsa. Nice engine detail.

(35) Unknown No-Cal high in the dome. The modeler who was flying this should write to Les Garber and get credit.

(36 & 37) Cougar FAC & AMA scale by Bill Passarelle a Skyscraper. spinner of silk and papier-mache and silk contains a freewheeling latch for outdoor flying.

(38) Jodel Bebe Peanut Scale by Chris Sydor

(39) Tony Italiano. After years of service to the rest of us he gets to do some flying.

(40) Le Pelican AMA & Coconut Scale by Dr John Martin. 37" span 1" to 1'

(41) John Voorhees with his monoplane Pennyplane. John has developed and marketed a wonderful series of foam surfaced stick models. The Breakfast Special made with light wood and light foam tray material has been a good entry to Indoor for some newcomers.

(42) Double Whammy by P J Bates. Not flown at USIC/NATS but included picture of it as it is one of the feature plans in this issue.

(43) Alco Sport Peanut Scale by David Robelen. Dave used a thin airfoil and kept the weight to between 4-1/2 and 4-3/4 grams to get flight times of around 100 seconds.

(44) Four on The Floor.

(45) Four Standing Up. This is really the secret of those long flights in the Mini-Dome. Get four modelers close together and there must be hot air rising.

(46) Pistachio by Gil Coughlin. This model has had about 700 flights in all sorts of places to demonstrate indoor flying.

(47) Piper Vagabond tail by Norman Reece. The script on this Coconut Scale model was done free hand, very nice work.

(48) Focker D 7 by Stan Fink. Diels plan scaled down to Peanut Scale size. The color to tissue was done by hand by Stan. A color photo would do it more justice.

(49) Swing'In Easy by Roy White. One flight of over 13 minutes recorded at Johnson City this year and had 12:52 CAT II at Flint Mich. air lock building earlier. 800 mgm, front wing microfilm, flapper wings poly micro. Very smooth it has none of the jerking associated with a monoplane with wings working together.

(50) Jim Clem my friend the Jet Speed flyer. Jim is still getting into the record book current CAT I LPP record holder.

(51) Penny (full) biplane by Jim Clem.

(52) Boussard 152 H by Tom Savage. Tom did a nice job modeling this French Utility Aircraft.

(53) Corbin Super Ace K/P Scale by Bates. Please refer to photo # 2 in case you forgot that your editor once glued two sticks together and covered them with tissue.

(54 & 55) "I've Got A Love-a-le Bunch of Coconuts. There They Are A Standing In a Row. Big Ones Small..." Sorry, no small coconuts here, only big ones waiting to be judged. A rows of great workmanship is what you see at the USIC/NATS Johnson City TN. You should go to fly, see the great models and your friends in '94.

****

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

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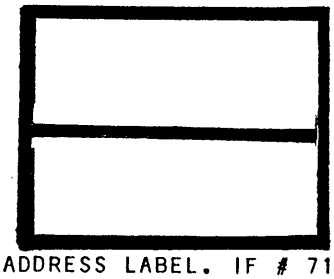

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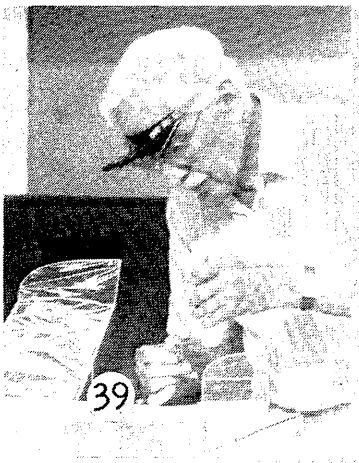
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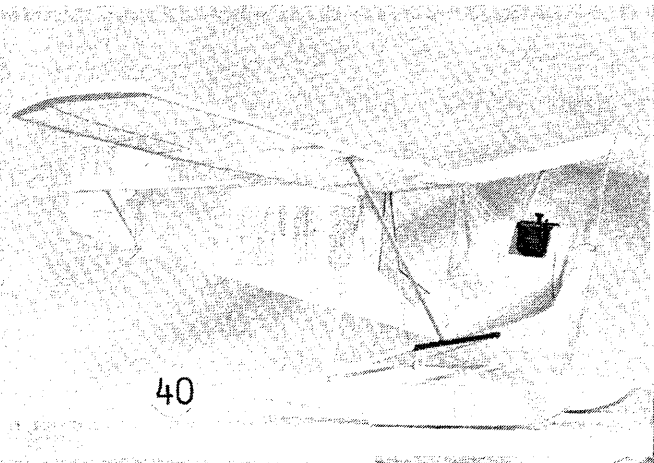
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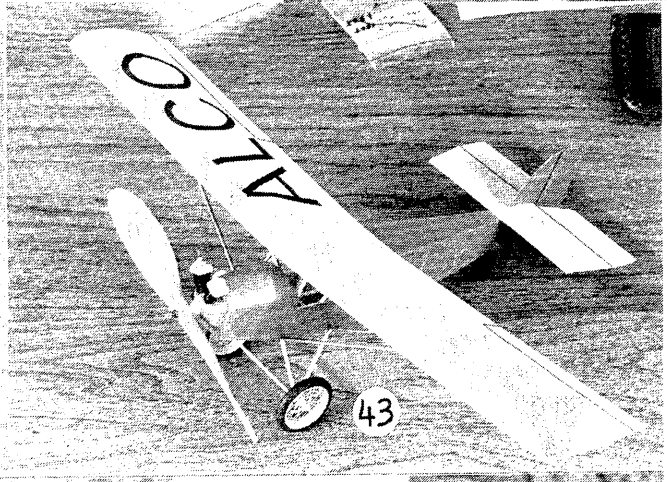

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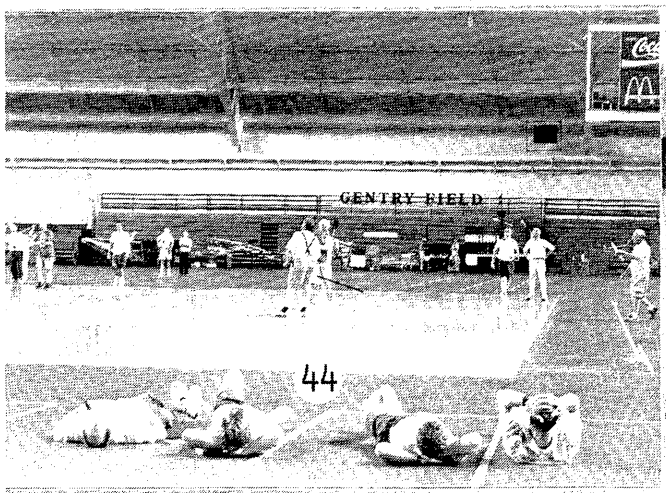

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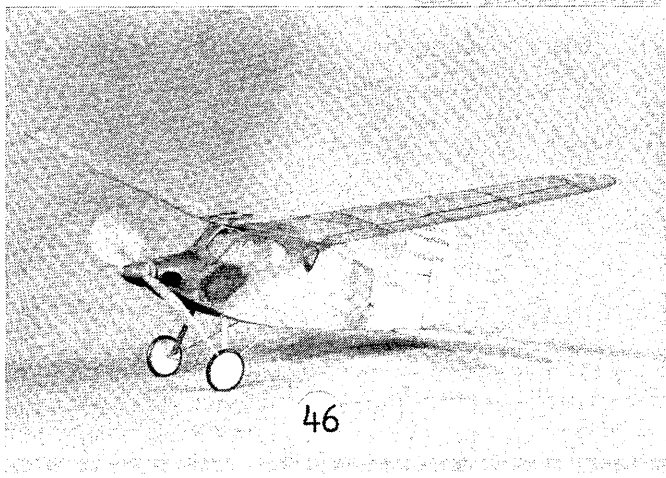
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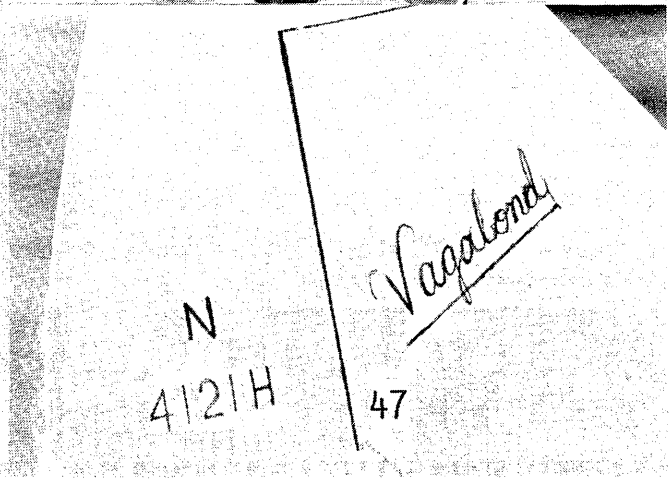

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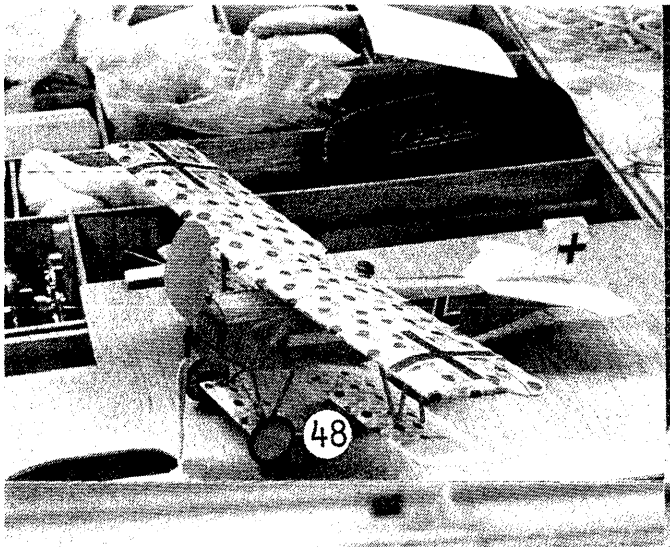
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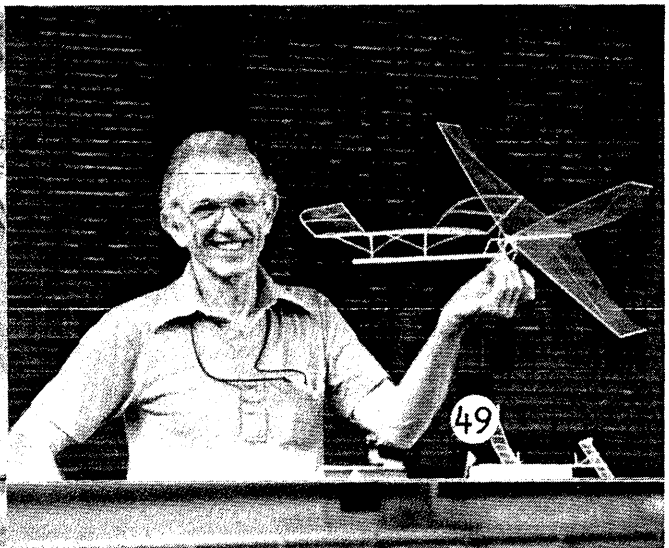
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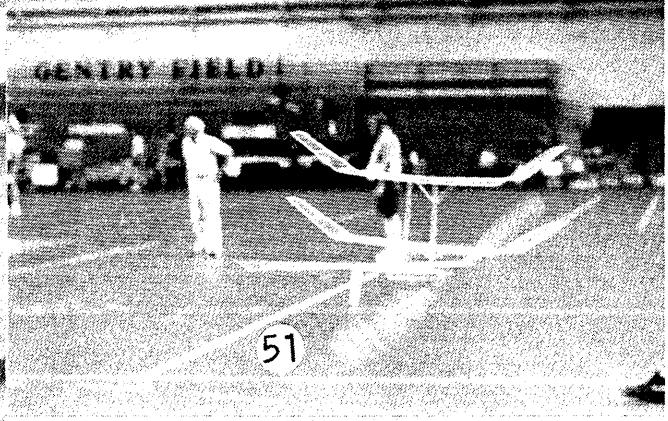

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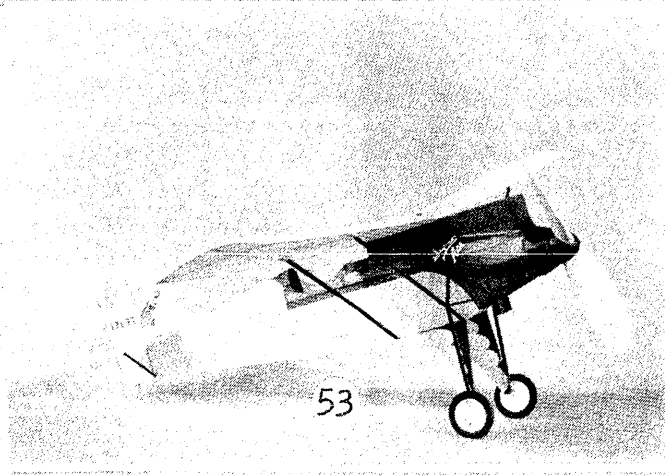
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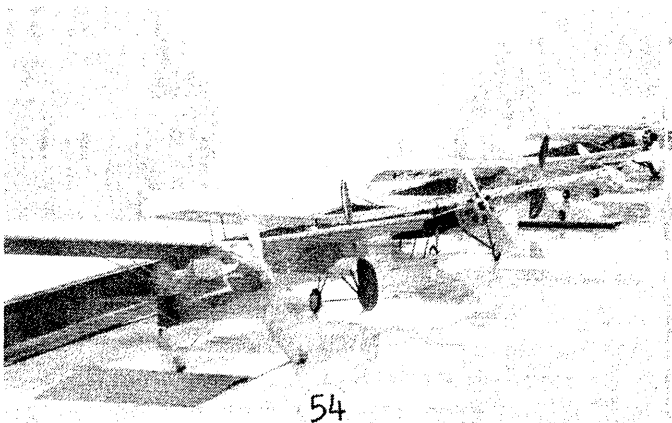
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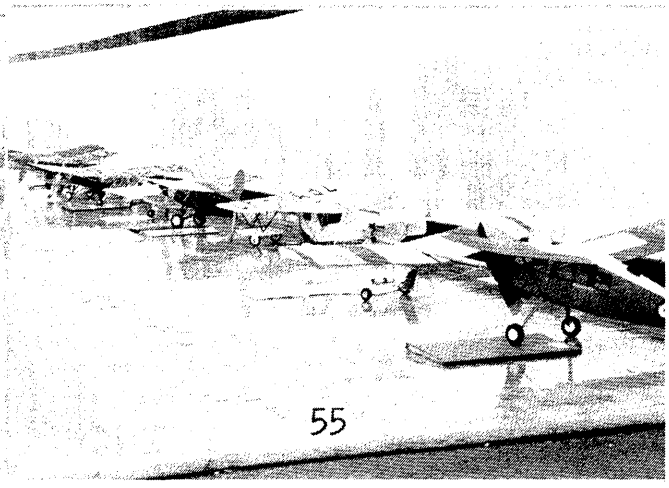
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SANDING APPARATUS FOR THIN BALSA SHEETS

By Bruno Waechter, West Germany

From: INDOOR NEWS (Europe) via EL TORBELLINO the newsletter of the San Diego Orbiteers.

I have had trouble buying thin C-grain balsa for my motor sticks and prop blades so I decided to build a sanding device where I could make these sheets from thicker sheets which are easier available.

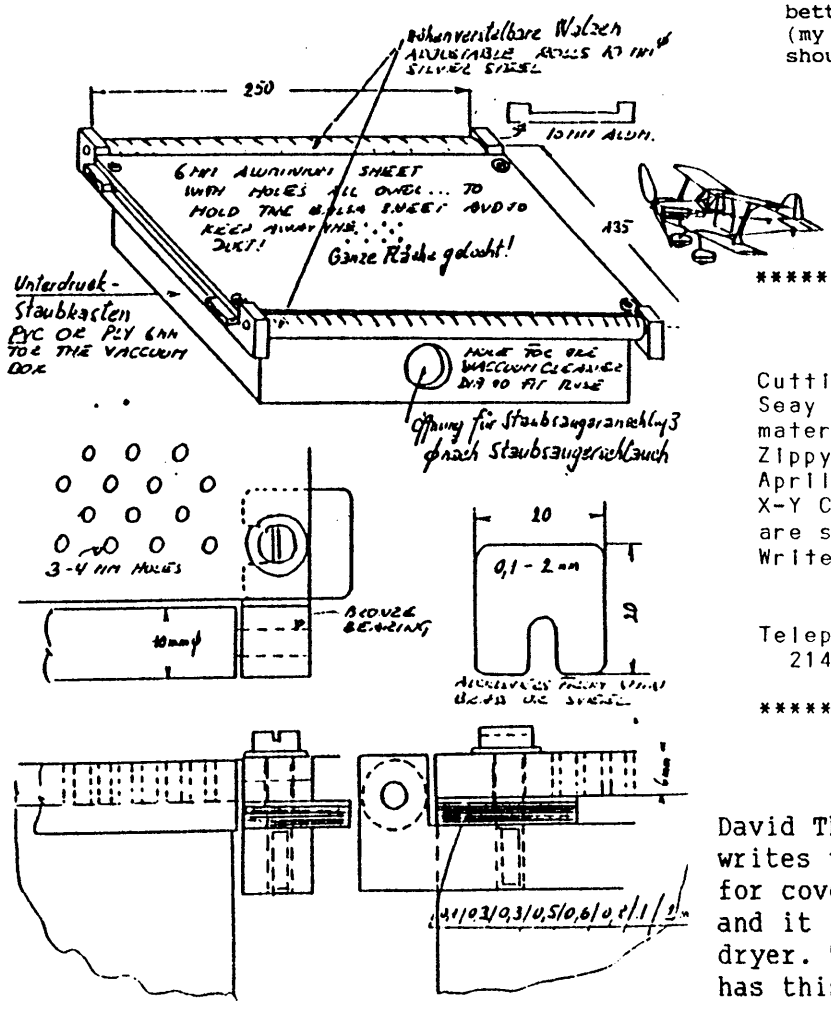
I have tried the method by sanding the balsa between two music wire guides of the right thickness but I found that the sanding paper was spoilt by the wires.

Therefor I designed a device where the thickness guides are moving with the sanding block and where the thickness can be easily adjusted.

On the shown apparatus I am able to sand balsa down to 0.2 mm without any troubles and furthermore with the vaccum cleaner the dust is kept away and the piece of wood held in place at the same time.

The sanding blocks are moved across the grain following the rotation of the guide rolls. It is possible to adjust the rollers so that you can sand tapered wood i.e. prop blades. The sanding blocks have different grades ending with no. 400.

It takes some time and effort to make the device but it is worth it ... and it certainly works.



ALSO FROM INDOOR NEWS (EUROPE)

from Boyd Felstead (AUS):

Microfilm Tank

I have a very heavy wooden "mike" tank 5'x3' with a bung hole in one corner for drainage purposes - and have several 2"x1" wooden stiffeners across the bottom to keep the masonite flat. This tank is awkward to lift onto the table on which I pour, so I have now made a tank 5'x3' using high density white polystyrene 20 mm (7/8") thick, as used in ESKY coolers, food containers etc.. Sides and ends of the same material were cemented by silicone to the "bung" hole so there would be no leakage when the plug was inserted. Obviously this featherweight tank is very much easier to handle, with less risk of busting my back lifting the heavy wooden tank. (Note by T.A.: the weight of the water is considerable, so this foam tank bottom has to be supported evenly by table or floor. Do not support it at the edges only!).

Because of the material the tank was painted with heavy duty acrylic paint (2 coats dark green). When using for the first time I found the film wasn't spreading as wide as usual. For a reason I checked with my trouble-shooting friend Bernard Smith. His opinion - a few months ago the acrylic paint was still giving off chemicals which were absorbed by the water and affected the surface tension, hence the poor spread. Cure - change the water a couple of times and add a small amount of detergent, "lather up", which would help to absorb the offending chemicals. After a good rinse out and fresh water put into the tank I am now getting a good wide spread of film.

Have since painted the inside of the tank with high gloss black enamel to see the film better when poured, and from past experience (my wooden tank was painted similarly) I should not have any film spreading problems.

Boyd has sent me a bunch of good stuff but because of my lack of experience with the really light weight planes I was unable to utilize it properly. Thanks Boyd. PJB

****

INDOOR BALSA

Cutting indoor balsa for 57 years makes Ed Seay Sr the longest running supplier of indoor materials. Ed also kits Paul McIlrath's Boston Zippy and Don Lindley's Bean Machine (both April '92 INAV). Planned is kit of Linstrum's X-Y Chromosome (April '93 INAV). Kits and wood are sold by the hobby shop run by Ed Seay Jr. Write or call:

Model Aircraft Labs
108 S Lee ST
Irving TX 75060

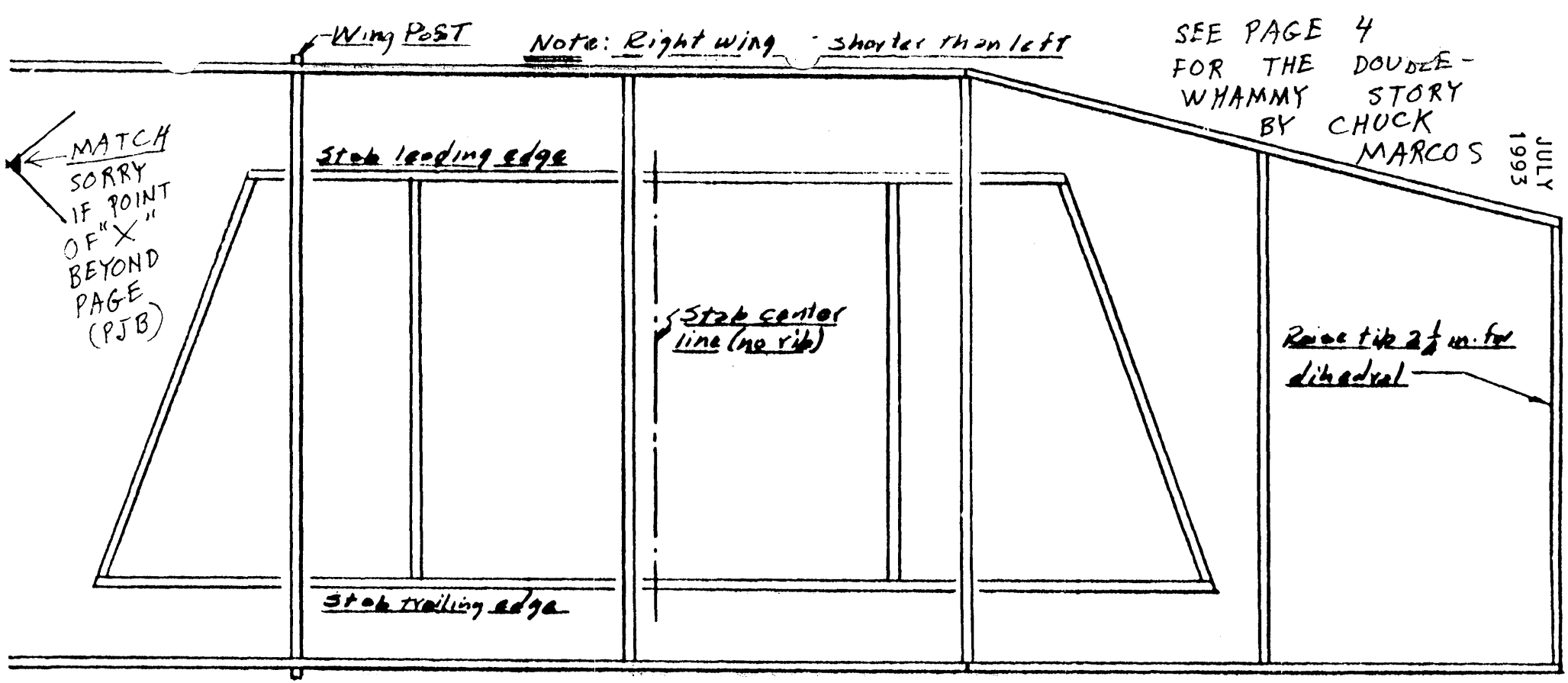
Telephone:
214-438-9233

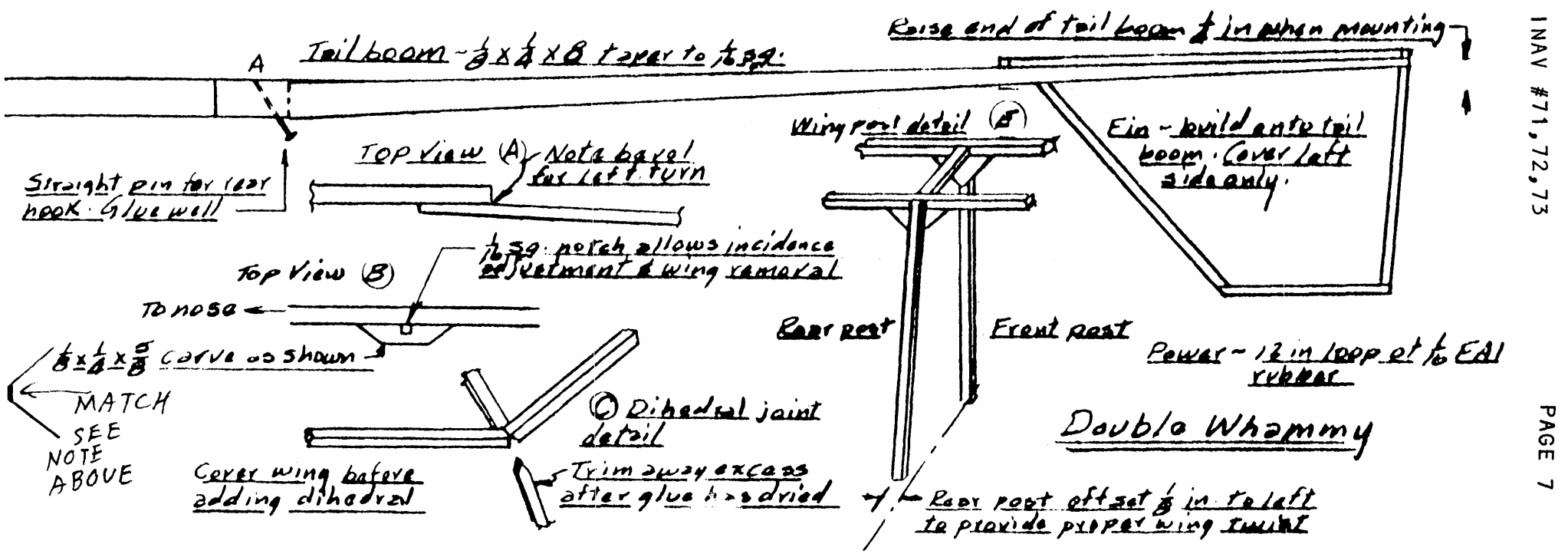
****

REYNOLDS WRAP FOR BOSTONIAN

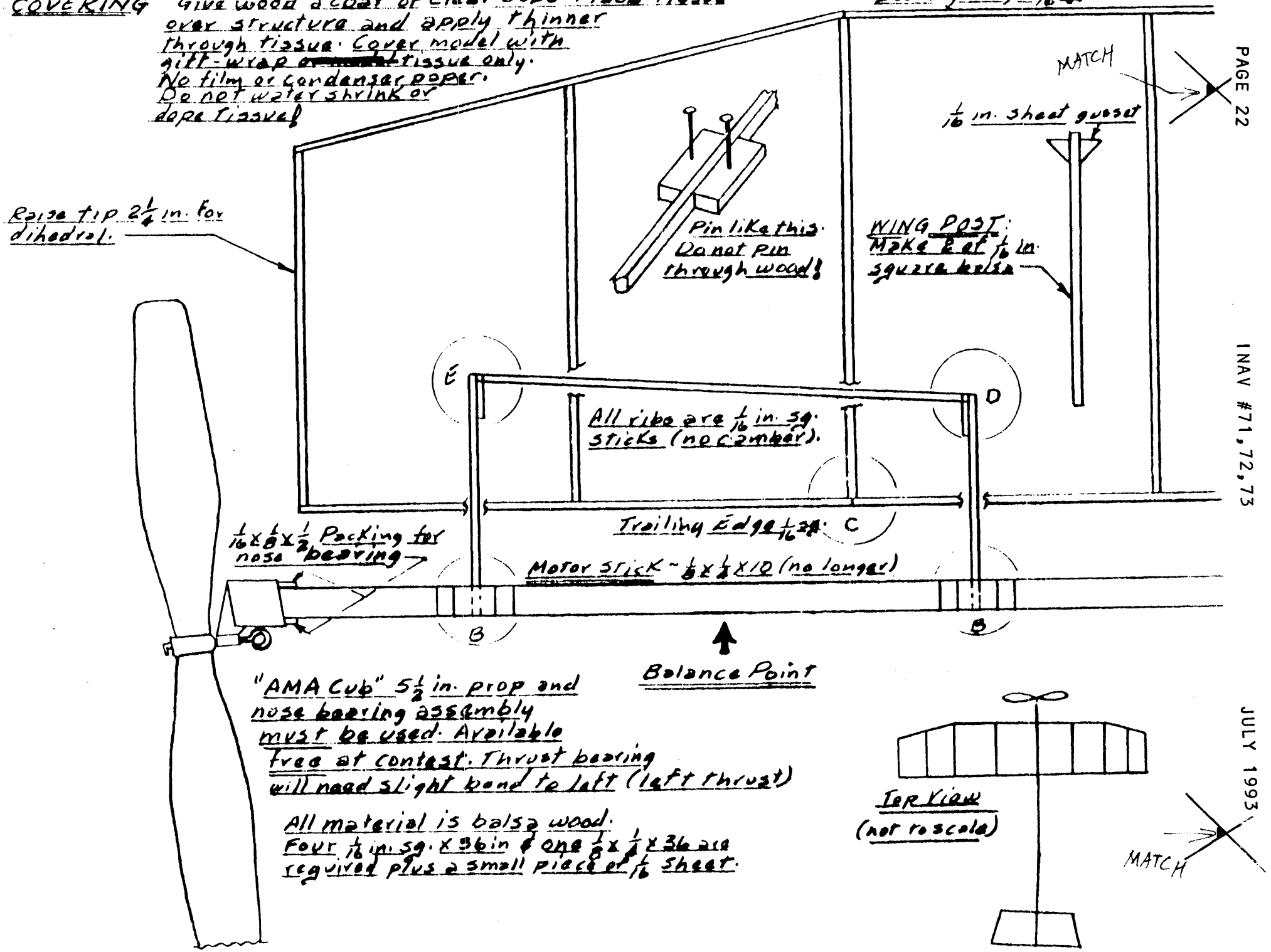
David Thomson a "SWOFF" member from Cincinnati writes that some of them use the colored wrap for cover. Adhesive is thinned contact cement and it is tightened with air from a hair dryer. The BEAN MACHINE pictured this issue has this cover.

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





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



B-13-30

DESIGNED BY: LARRY

DRAWN BY: JAMES

RUBBER .036×10 F/

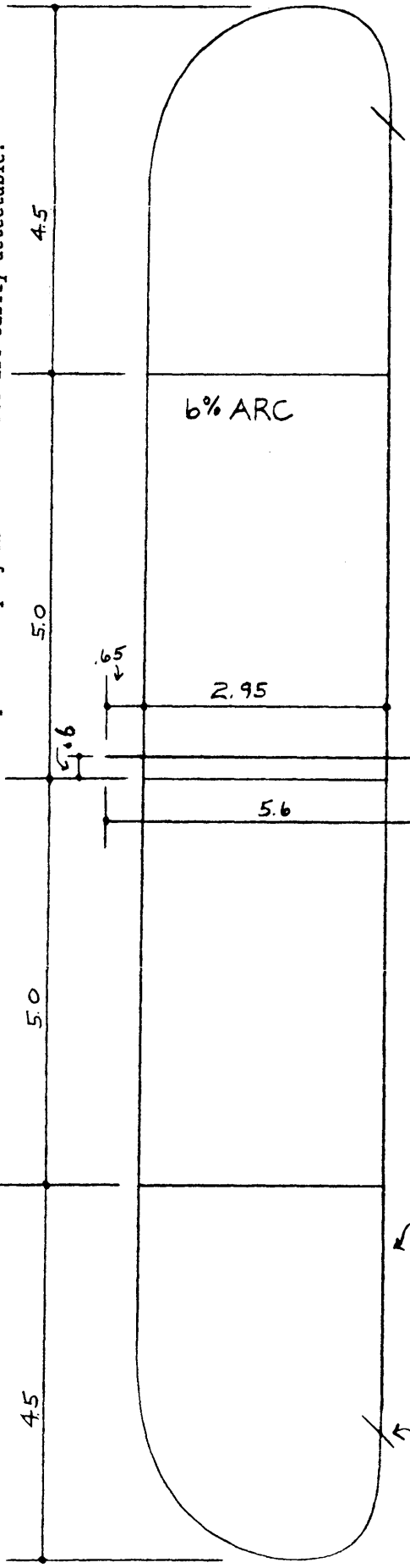
WING: 195 MG

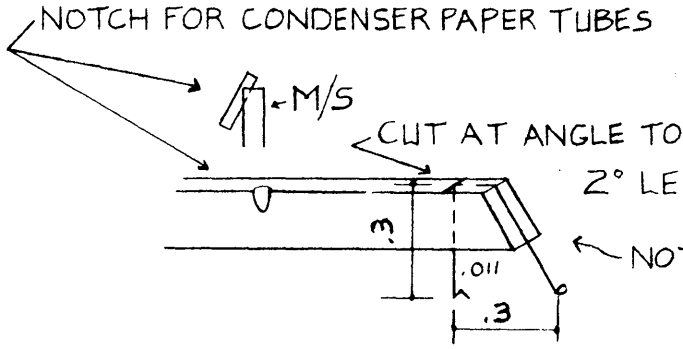
M/S-STAB: 250 M

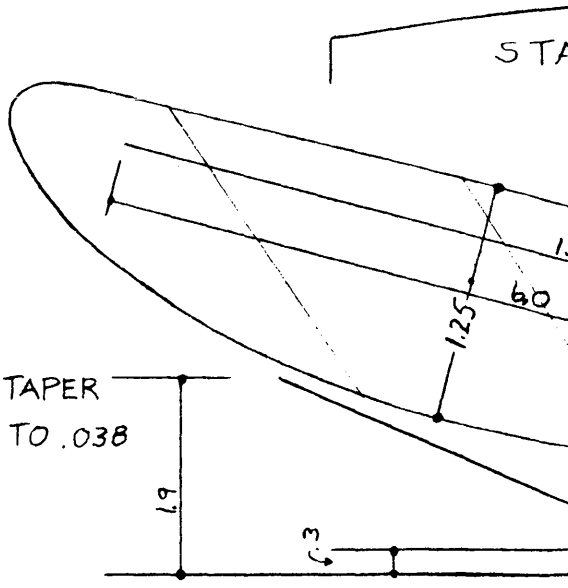
PROP: 130 MG

BEST TIME: 13 MIN

30 FOOT CEILING -







NO TOUCH LOW CEILING EZB

BY: LARRY COSLICK

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

I started with a motor stick of 7 inches and finally settled on a model with a motor stick of 5.6 inches. It swings a flaring 13.25" x 23" pitch prop and uses a loop of tan 10" x .036. At launch the prop rotates at 79 rpm with a launch torque of .09 to .11. The torque is checked before each flight with a hand held torque meter. I started with a 10" x .031 loop and worked up in thickness until the model was just under the steel and landed with less than 1/4 row of knots.

This model is competitive in ceilings up to 40 feet. If you are flying in a site with a scrubable ceiling, a long motor stick is your best bet.

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

Y COSLICK
MERSEAL
AI TAN

MG

LITES –
NO TOUCH

PROVIDE
FT THRUST

T TO SCALE

AB RIB

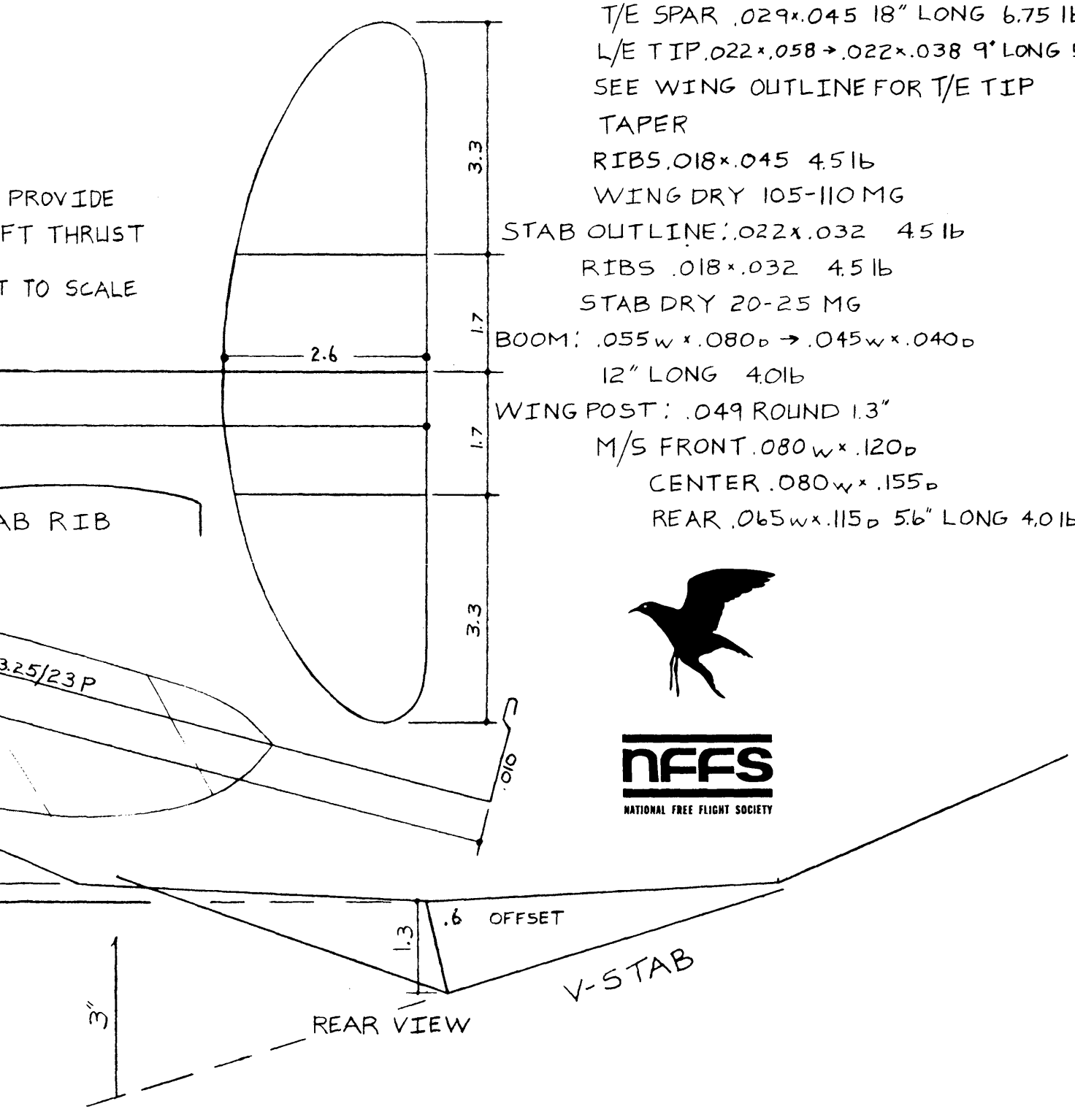
PROP: SPAR CUT FROM IMS 12" TAPERED STOCK
.040w × .055d AT HUB → .040w × .025d AT TIP
SPAR WEIGHT 25 MG – 35 MG WITH HOOK
BLADES .006 4.5 lb FORMED ON 23° PITCH BLOCK
BLADES ATTACHED WITH THINNED CARPENTERS GLUE

WING: L/E SPAR .029 × .058 10.5" LONG 6.75 lb
T/E SPAR .029 × .045 18" LONG 6.75 lb
L/E TIP .022 × .058 → .022 × .038 9" LONG 5.25 lb
SEE WING OUTLINE FOR T/E TIP TAPER
RIBS .018 × .045 4.5 lb
WING DRY 105-110 MG

STAB OUTLINE: .022 × .032 4.5 lb
RIBS .018 × .032 4.5 lb
STAB DRY 20-25 MG

BOOM: .055w × .080d → .045w × .040d
12" LONG 4.0 lb

WING POST: .049 ROUND 1.3"
M/S FRONT .080w × .120d
CENTER .080w × .155d
REAR .065w × .115d 5.6" LONG 4.0 lb



NATIONAL FREE FLIGHT SOCIETY

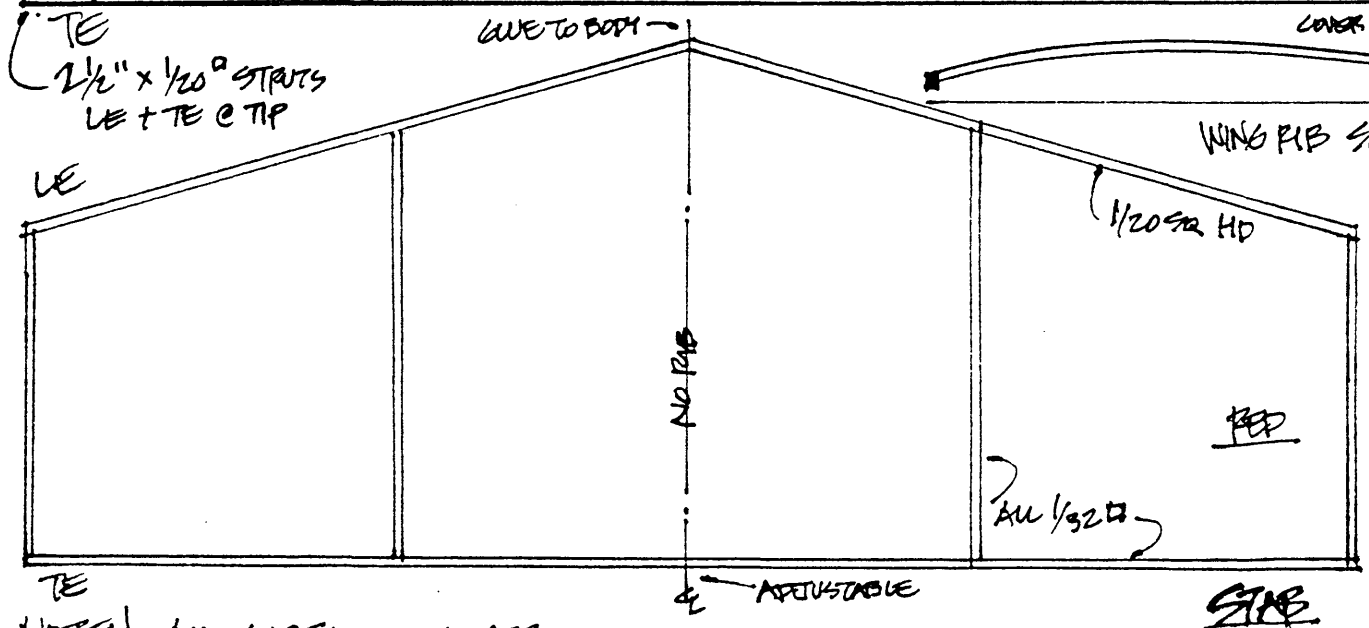
BOST·O·BIPE

SPORT BOSTONIAN FOR FUN IN LOCAL GYM, NOT WINNING THE USIC.

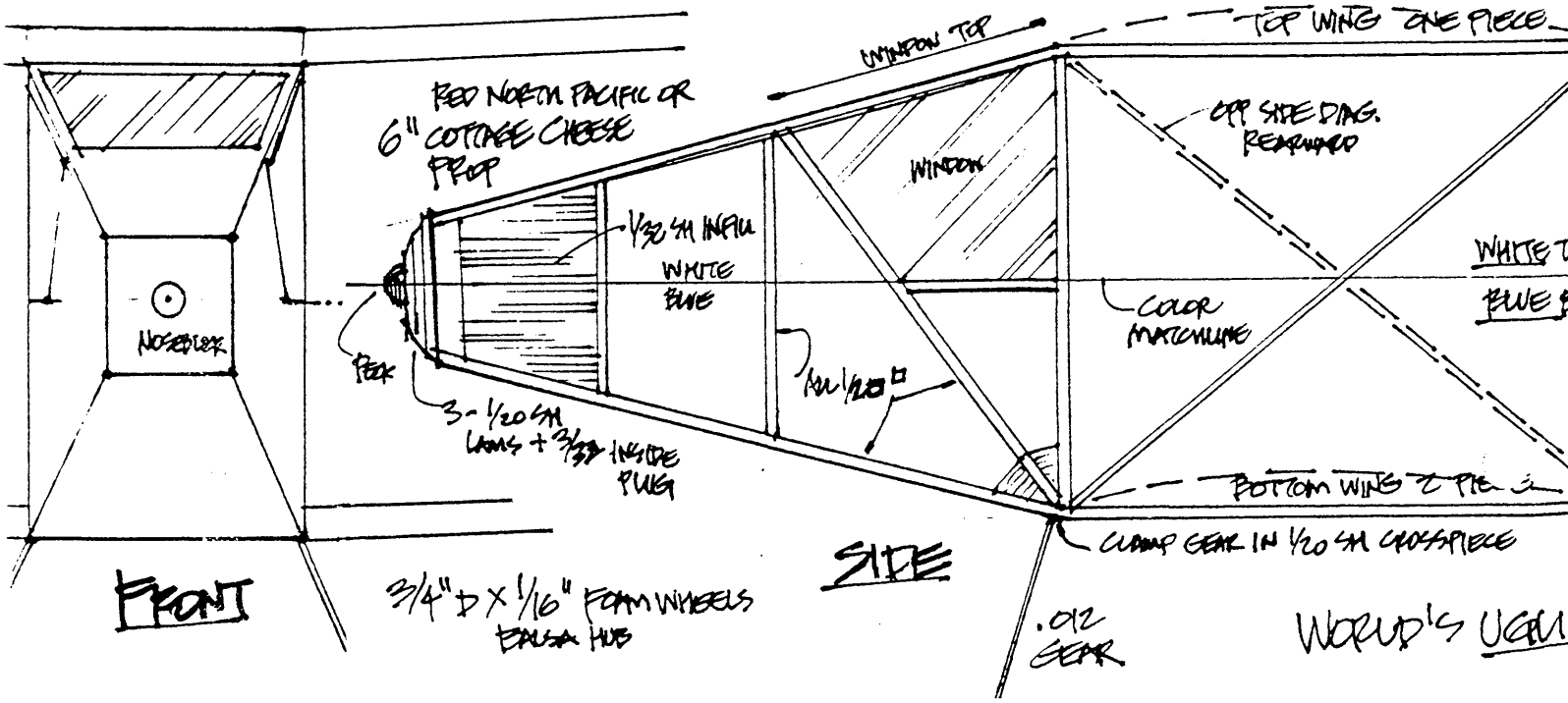
INAV #71,72,73

JULY 1993

BUTT TO BODY



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



1/32 SLOPED TO AIRFOIL

1/20 □

WHITE TOP WING
BLUE LOWER

1/16 x 1/20 □ LE + TE STRIPS

LOWER WING HAS NO DIH SECT.

BIPLANE WINGS

1/4" DIHEDRAL EA TIP T & B

FULL SIZE PLAN

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

TAPER TO POINT @ TAIL

1/32 SH

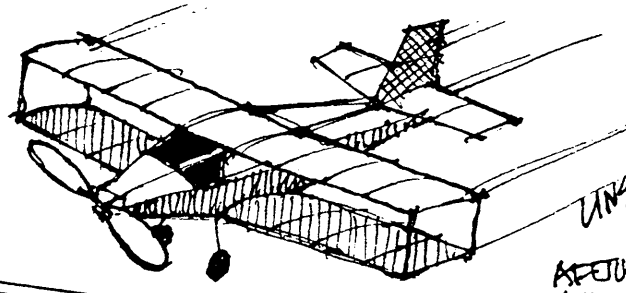
WINDOW ULTRA-FILM

RED FIN

FIN

TOP

TRULY UGLY!



LINSTRUM

ADJUST BY SHIMMING STAB TE AND TWISTING FIN OFF ℄

FIN COVER BOTH SIDES

STAB (COVER LE ONLY)

1/20

STAB SUPPORT ON ℄ ONLY

1/32 □

1/20 □ LONGERONS UPRIGHTS

RIGHT SIDE DIAGONAL

1/16 OD ALUM OR BAMBOO REAR PEG

TISSUE COLOR LINE

1/20 SH

1/32 □ DIAGONAL

BOST·O·BIPE

AN INAV PLAN

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

RED/WHITE/BLUE

70 BOSTONIAN MAMA RULES

INDOOR ONLY!

BOST·O·BIPE

FULL SIZE PLAN

EST BIPLANE!

BUILDING NON-BANANA FUSELAGES

and other things the old guys think you know

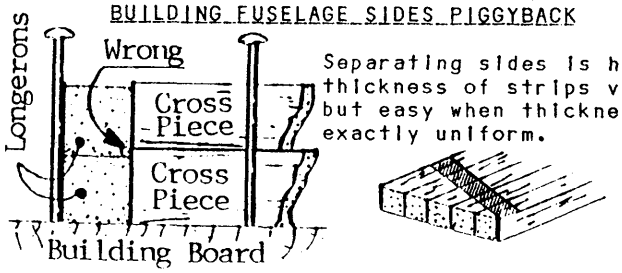
First use A "grain" sheet for your strips. "C" should not be used for three reasons. First, the resulting strip is the same as a strip from "A" turned 90 degrees. Second, strips from "C" will have more variation in weight. Actual example from "C" sheet consecutive .062' square strips (grams) .104-.095-.094-.093-.095-.095-.097-.098-.131-.118-.107.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

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

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

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

BUILDING FUSELAGE SIDES PIGGYBACK

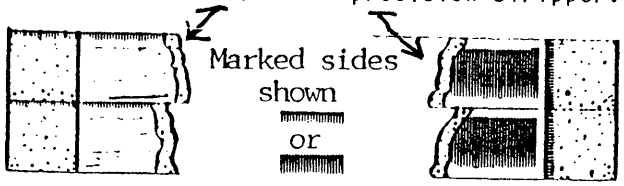


Separating sides is hard if thickness of strips varies, but easy when thickness is exactly uniform.

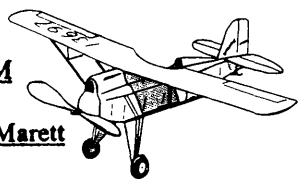
Before stripping, mark one face of sheet with felt tip pen, then orient marked sides of strips as shown when building.

When all sticks are cut from one sheet:

If strips are cut from different sheets using precision stripper:



MORE FROM SAM 86 SPEAKS



INDOOR TRIM

A letter from John Marett

Dear Dan:

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

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

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

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

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

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

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

CONTINUED ON PAGE 25

CONTINUED FROM PAGE 24

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

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

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

John

WE KNEW THAT

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

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THE WAY IT WAS

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

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PHOTOS IN THIS ISSUE

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

****

Cockpit Windshields Aluminum Cowlings

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

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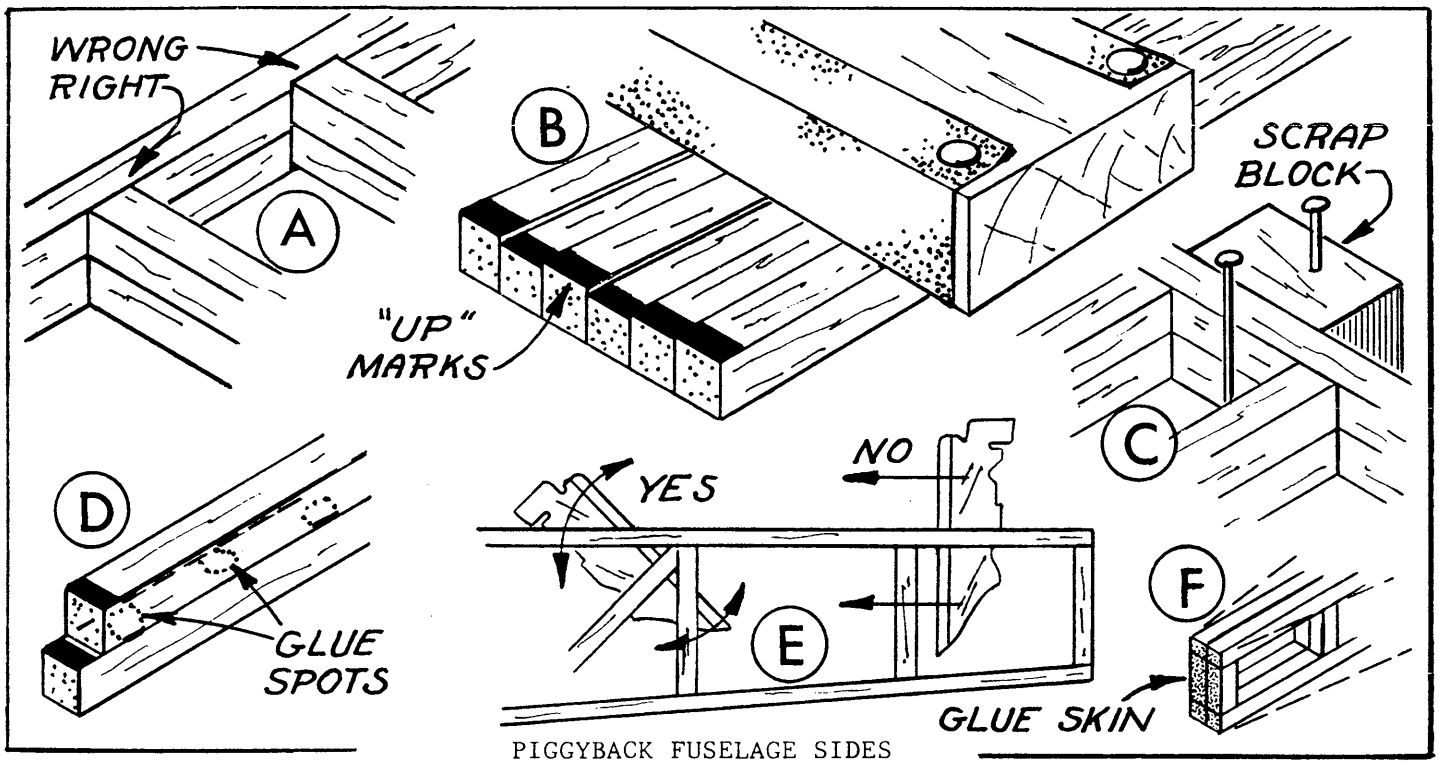
GOOD LOOKING BODIES

Paul N McIlrath

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



PIGGYBACK FUSELAGE SIDES

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

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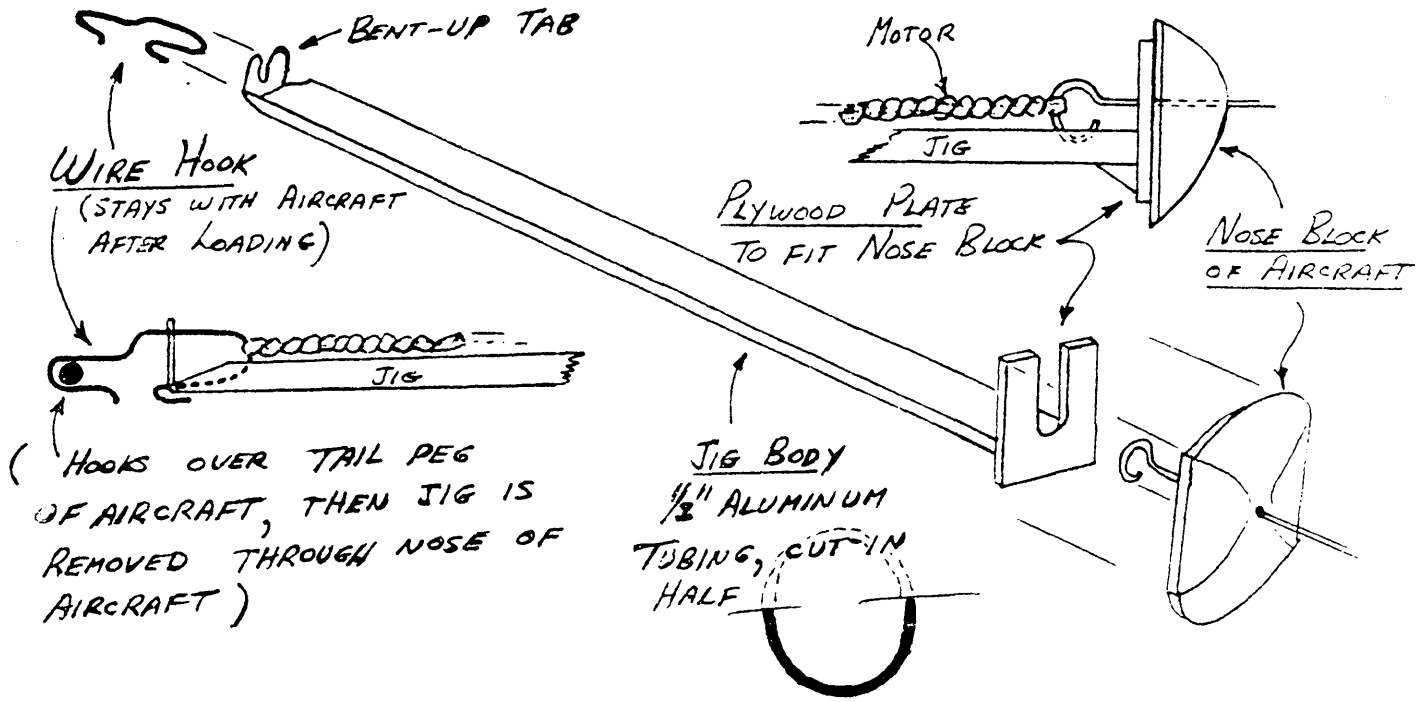
THREE CONNECTIONS FOR BETTER MODELING

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

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

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

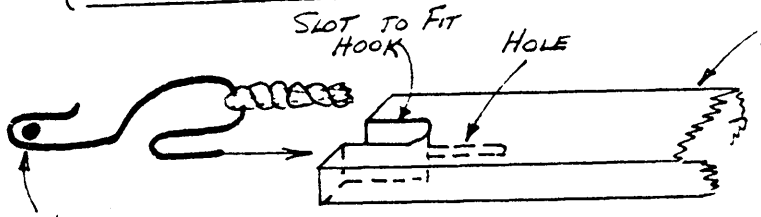


LOADING JIG FOR WOUND MOTORS

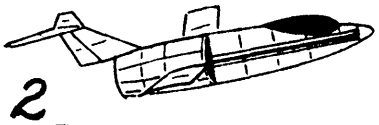
NOT TO SCALE

ALTERNATIVE 1

(USING A STICK FOR A JIG BODY)



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

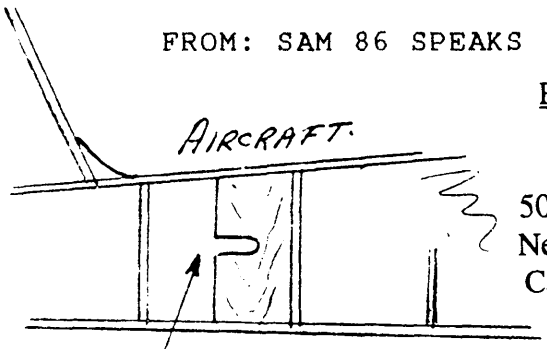


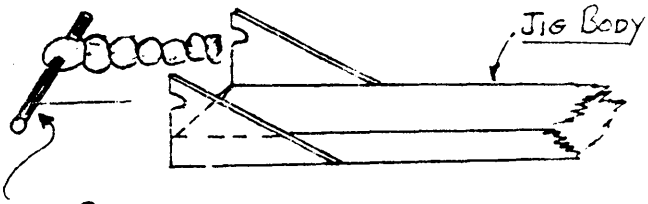
ALTERNATIVE 2

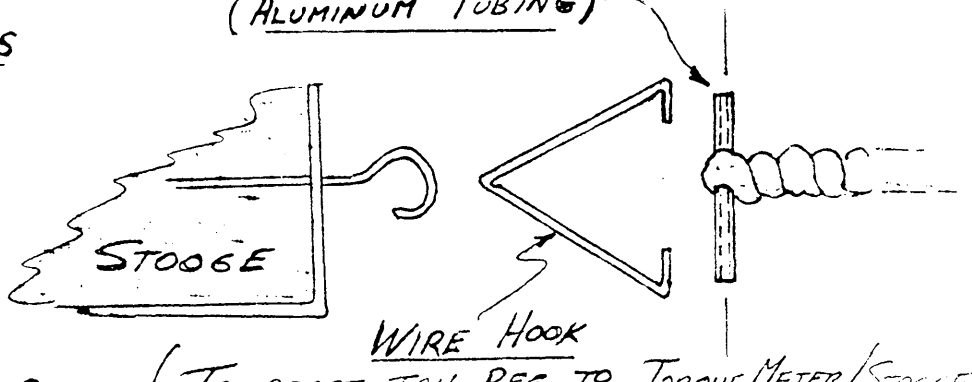
(USES THE ACTUAL TAIL PEG OF THE AIRCRAFT

FROM: SAM 86 SPEAKS Editor

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







Roy Bourke
Markham Indoor Group

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THE F1D CHALLENGE

Lt. Col. Bob Randolph

Partial Motor Test Flights

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

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

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

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

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

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

Peak 1/4 motor flying time will require a fully broken in motor but I must admit I break in these little motors by my flight tests. You do not want to out climb the site so start out with all the turns it will take but back off so that the launch torque is 25 units. If this is still too much power, use your steering pole to prevent out climbing your site. Better to only climb 1/2 way up and then keep increasing launch torque slowly. You can't really tell if the motor is the right size until you reach full height. Upon landing, the turns remaining will indicate if you have too much or too little power. A non-VP prop should have about 1/3 row of knots left. A good VP prop will have very few turns left. For either type of prop. going deadstick before reaching the floor means the motor is too powerful. Whether to correct this by reducing the thickness or by increasing the loop length depends on the flight time you achieved.

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

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

****

William E. Gough Jr.

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

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NEW RETRIEVAL TOOL

From: F.M. L. Kruse and Ben Strauss

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

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

****

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

INDOOR
NEWS and VIEWS

Indoor News And Views
1025 Cedar Street
Catawissa MO 63015

Indoor Flying Models is approximately 160 pages, 8.5" x 11", with loads of plans. Many of the plans are full size and include I.M.S. Kits in addition to the original designs of famous contest winners like Banks, Coslick, Brown, Hunt, and dozens of others. The scope covers gliders to the F.1.D. international microfilm class models. With all the illustrations, technical data, building and experimenting with his own models, it comprises years of work.

You will find a development that starts with a theme of man's first dream of flying and how with imagination and the use of experimental models he actualized this dream. Then with a strong message for instructors he presents material that can be used to stimulate interest before the instructor adds his own experience. The basics of tools, materials, and "the right moves" lead you from the most simple to the most complex models and techniques, including "How to brew your own microfilm solution" and the secrets of the experts are revealed including "What your best flying buddy won't tell you."

By Lew Gitlow

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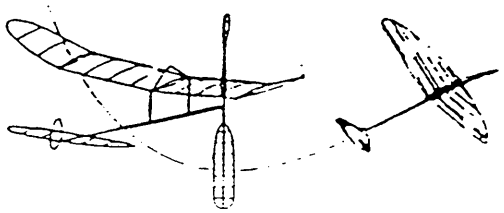
INDOOR
NEWS and VIEWS



EDITOR: Larry Coslick
4202 Valley Crest Hill Drive,
St. Louis, Mo. 63128

EDITOR'S CORNER

As we begin our first issue of the newsletter, we would like to introduce the editorial committee.

L. COSLICK - EDITOR
R. WHITE - PUBLISHING MGR
H. HENDERSON - TREASURER
M. J. REILLY - MANAGING EDITOR
BILL MARTIN - SCALE EDITOR

Many of you wrote us that you sent in money over a year ago and received nothing. We apologize and promise to correct the situation. Also, we are truly grateful for the many notes of encouragement.

Our intent is to make the newsletter as informative as possible, with a strong emphasis on building techniques from modelers around the world. For the newer indoor modeler, we will republish articles from past issues. We want to hear from you regarding which information you would like to see published. We plan to cover all aspects of indoor flying. We welcome any stories and/or prints that any of you wish to contribute. All mail should be sent to:

ROY WHITE
1025 CEDAR STREET
CATAWISSA, MO 63015

We wish to thank Plenny Bates for his assistance in getting us started. With the committee approach, we hope to publish the newsletter in a timely fashion.

We are all enthusiastic about taking command of the newsletter and anxious to get our first issue in your hands as soon as possible.

****

LETTERS TO THE EDITOR

Dear Gas House Gang,

All five of you have made me happy by BEING. Why: Collectively causing INAV to exist and function. I'm an ancient indoor modeller who hasn't flown a microfilm model since 1938. Undirregardless, my interest hasn't waned.

My esteemed friend Bob Gibbs has stayed in touch since being a student in my model class in St. Louis (S B F Model Club) when he was 9 yrs old! Twice we've been to the Mira Loam Gym where I met Bob Randolph and Tom Vallee.

I've a logjam of things to say later about this wonderful free-flight fraternity where the dye in the wool is indelible.

Back to the most delightful letter received in many moons: Assuming Roy White wrote * this mix of warmth, worthiness, and humor. Hats off to him. It's enough to make a guy try to become famous by sending something to be famous for sending.

I'm a retired mech engr. with a strong urge to fly indoor stuff again. I do, but it's more of a comedy act, like the "Twirltail Trimotor" & "Fragmodiliac". The trouble is I'm too deep into other things, like flying an Aeronca Champ all over creation and into copper mines, and finishing building a building to build the airplane I'm building in. (Syntax suffers when I write) I do write a column for a Palm Springs paper, Sandy Ago and other stuff. Enough!
Please fill in the blanks in the blankety-blank check enclosed to renew my subscription. I trust people who consider that I may be locked up.

Somehow or 'nother, Catawissa tickles my funnybone to the bone. Wish it was MY address.

Sincerely, Ed Lockhart

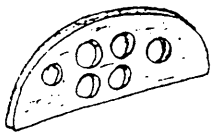
* writen by Plenny Bates

****

BIC DISPOSABLE SHAVER

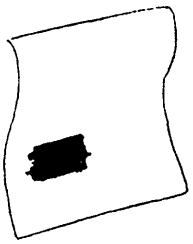
Super sharp .004 blade that is easily removed by inserting a jeweler's screw driver between the handle section and the front face plate. Use a prying motion to remove the plate, and CA a 1/32 square balsa strip to the top edge of the blade for easy pick up.

****

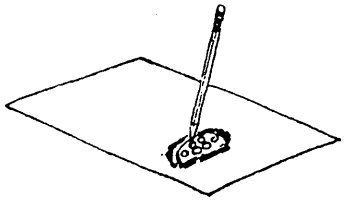


① CUT INSTRUMENT PANEL FROM 1/32" BALSA CUT HOLES W/SHARPENED TUBING

BOB ISAACKS
PILOTOS LOCOS - '93

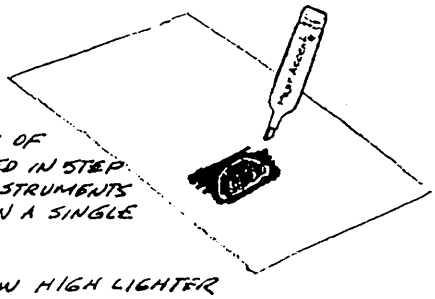


② AIRBRUSH BOND PAPER W/ FLAT BLACK PAINT LARGER THAN INSTRUMENT PANEL



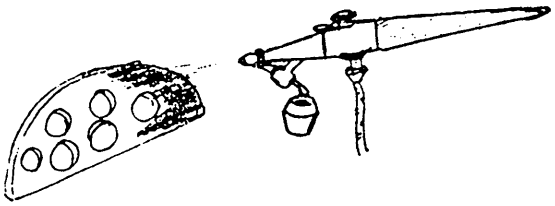
③ MARK EXACT LOCATION OF INSTRUMENTS ON PAINTED AREA W/ PENCIL

④ USING COMMERCIAL INSTRUMENTS OR ONES CUT FROM MAGAZINES; GLUE INSTRUMENT FACES ON MARKED LOCATIONS USING RC-56

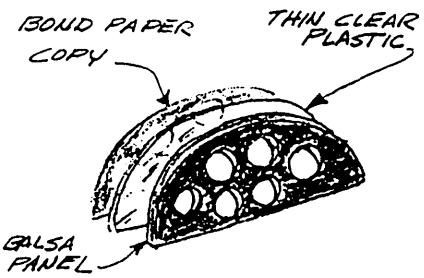


⑤A MAKE COPY OF SHEET PRODUCED IN STEP 4, THIS PUTS INSTRUMENTS & BACKGROUND IN A SINGLE PLANE

⑤B USE YELLOW HIGH LIGHTER TO COLOR INSTRUMENT HANDS & BEZEL



⑥ AIRBRUSH BALSA PANEL W/ APPROPRIATE COLOR · USUALLY FLAT BLACK OR DARK GRAY.



⑦ MAKE A SANDWICH UTILIZING THE BALSA PANEL, CLEAR PLASTIC AND THE BOND PAPER BACKGROUND W/FACES. USE RC-56

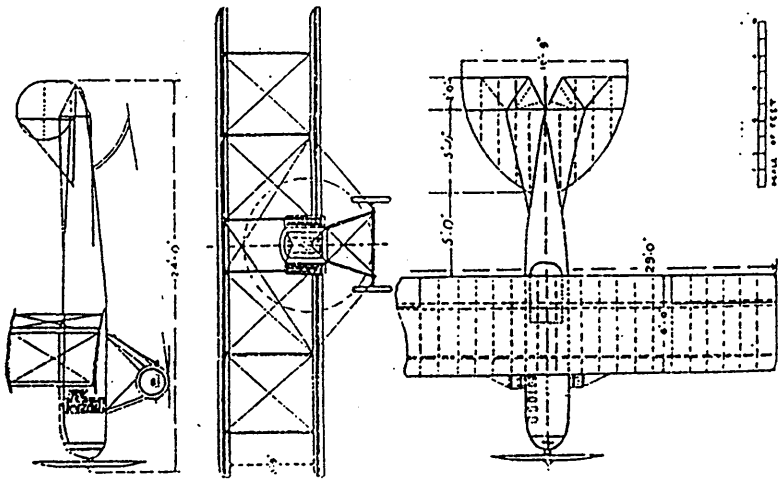
HERES A WAY TO MAKE REALISTIC LOOKING INSTRUMENT PANELS WHICH IS A BIG IMPROVEMENT OVER PLAIN PAPER ONES, TRY IT!

SCALE NEWS & VIEWS
By Bill Martin

Just a few words to inform you what we intend to do in the coming issues. Most of all, I would like to use the column as a vehicle to share your ideas and comments on the subject of scale building. So, please send along any building tips, plans, 3-views, articles or questions that you may have.

If you are in need of a 3-view, color data, photos, etc. on a particular A/C, we will print your request in hopes that someone "out there" can be of help.

Building tip for this issue concerns ways to improve your instrument panels. The plan follows, so get out your tweezers, magnifiers & the 1/ 32" sq. and build the Wright Type L Military Tractor.



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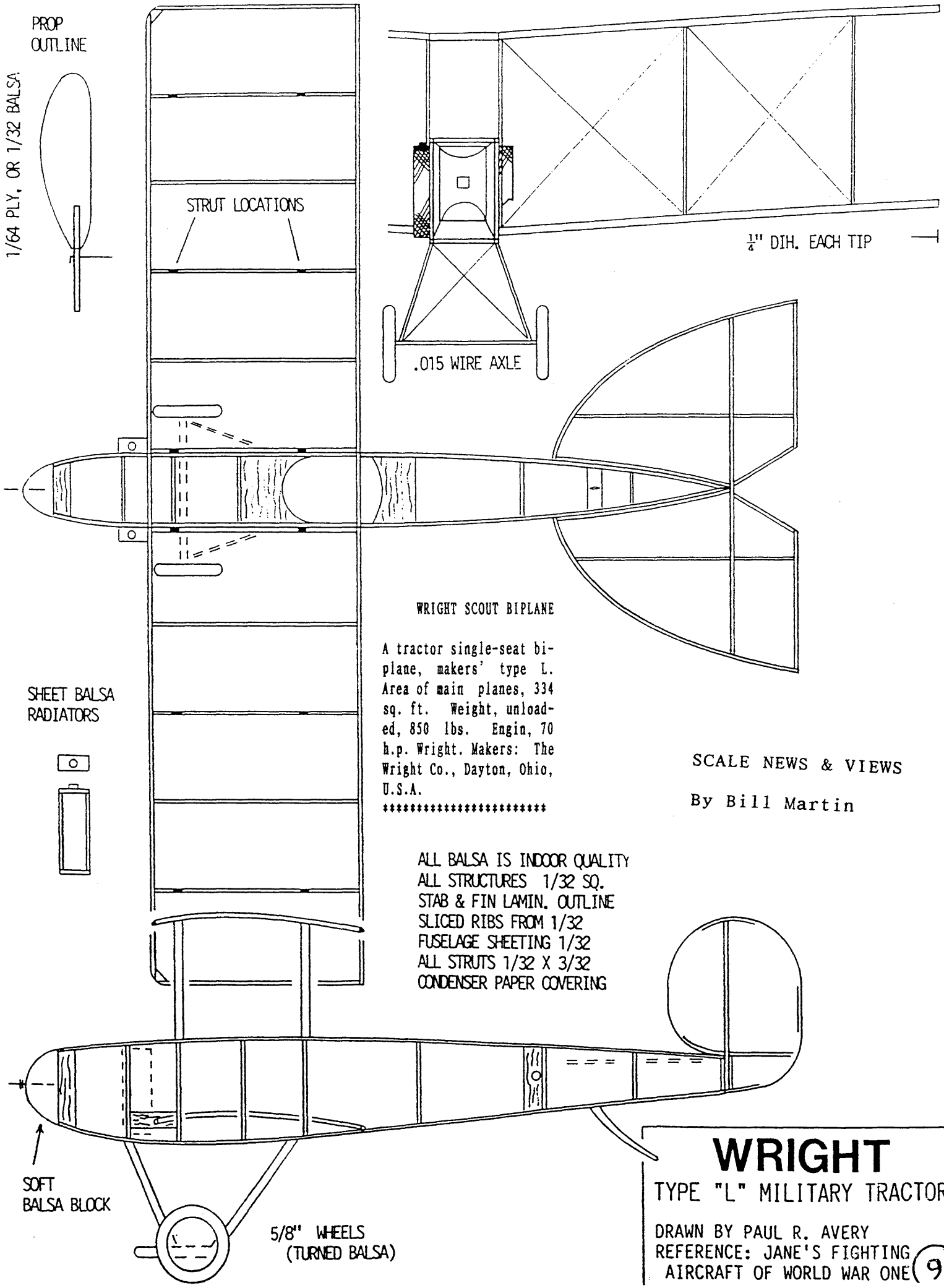

WRIGHT SCOUT BIPLANE

A tractor single-seat biplane, makers' type L. Area of main planes, 334 sq. ft. Weight, unloaded, 850 lbs. Engin, 70 h.p. Wright. Makers: The Wright Co., Dayton, Ohio, U.S.A.

****

ALL BALSA IS INDOOR QUALITY
ALL STRUCTURES 1/32 SQ.
STAB & FIN LAMIN. OUTLINE
SLICED RIBS FROM 1/32
FUSELAGE SHEETING 1/32
ALL STRUTS 1/32 X 3/32
CONDENSER PAPER COVERING

SCALE NEWS & VIEWS

By Bill Martin

WRIGHT

TYPE "L" MILITARY TRACTOR

DRAWN BY PAUL R. AVERY
REFERENCE: JANE'S FIGHTING AIRCRAFT OF WORLD WAR ONE

STRAIGHTENING CROOKED TAIL BOOMS

By Larry Coslick

I have been building intermediate sticks for the past 3 years and it seems that every time I build a tail boom, the last 1/3 of the boom has had a curve in it. I have tried steaming the boom on a tapered form and soaking the boom and form in water. However, these procedures did not work. Some builders tell us to use the curve to obtain a left turn, but I do not like to sight down a motor stick and see a crooked boom. Recently, I glued a boom together and again I had the same curve when it was removed from the tapered form. I set the boom aside and while working on another project, I laid a pair of pliers across the aft section of the boom and crushed it. The damaged area was small, so I decided to cut out the damaged section and butt joint the two to- gether. After the repair was made, I noticed the boom was straightened, yet not straight enough. After three more butt joints, I had a boom that I could live with that only added .004 grams. For the builder who is interested in appearance, the butt joints are hardly noticeable.

The procedure is as follows:

Determine where the curve starts and mark it. Slide the boom over the tapered form and wrap a 1/8" wide strip of Scotch 230 drafting tape (available at office supply stores) around the boom, where the cut is to be made. Drafting tape will not tear .006 C grain balsa. Match the ends of the tape so that a perfect circle can be cut. I use the tape because it is very difficult to make a perfect cut freehand. Hold the tapered form in your right hand and only rotate the form while following the edge of the tape with a new razor blade.

Separate the two sections and check for a good fit. Set the front piece aside and cut the back section in two equal parts. Check again for a tight fit. Apply thinned Dued or Ambroid glue with a plastizer added to each end of the aft section where the last cut was made. Slide the 2 aft sections on the form and align the two. Take a small brush and apply acetone around the joint and rub the joint back and forth. Also, rotate the form so that the glue won't stick to the form. Remove the boom and check for straightness. It might be necessary to reverse the seam on several sections along the boom to get it straight, but normally this is not necessary. When the aft section is straight, slide the forward and aft sections on to the form and reattach the two. On the last 2 booms that I made, one took 6 butt joints, with 2 seam reversals and only added .006 grams. The other boom took 2 joints and added .002 grams. Although I don't use this procedure to straighten bowed motor sticks, I'm sure it would work. After the boom has been straightened, I usually leave it on the tapered form for several days to let the glue cure.

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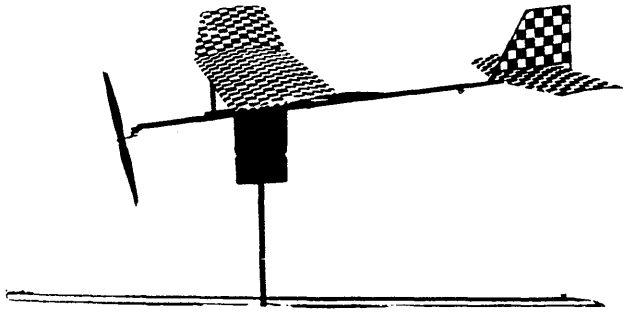


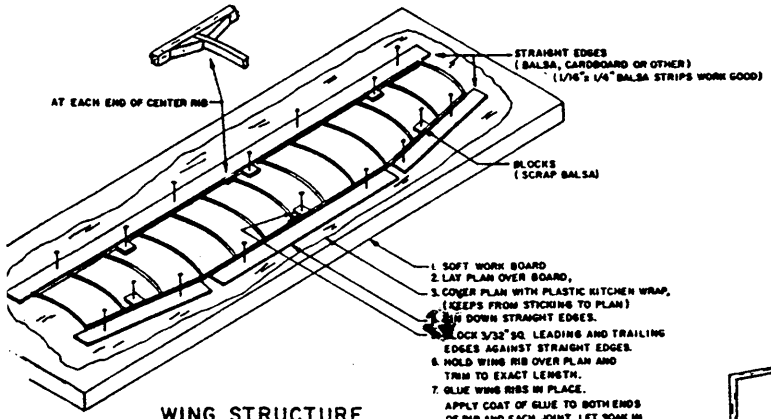
ROY WHITE'S CHECKERBOARD BLACK AND YELLOW P-24

P-24 CONDOR

If you are having trouble getting fliers interested in indoor flying, introduce them to Don Mace's P-24 Condor. This slow-flying stick model has a 24 inch wing span, with sliced ribs, a 7-inch plastic prop and is covered with Jap tissue. The only requirement for flying in competition is that the model must be built with the wood supplied in the kit and the finished weight must be from 11.5 to 13 grams. When flown in a 40 foot site, these models will turn in times of 3 to 4 minutes on a loop of rubber .087 x 48. The kits are available from:

MACE MODEL AIRCRAFT COMPANY
359 SOUTH 119TH EAST AVENUE
TULSA, OKLAHOMA 74128
(918) 437-5490

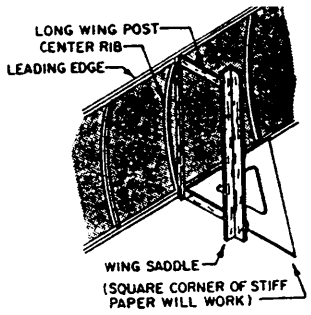
The cost is $9.95, plus $2.00 postage. Don has been selling the P-24 since 1989 and has sold over 3000 kits, some of them going to the Air Force Academy and several other Univers- ities. He also carries a smaller version of the P-24 called the P-18 Hawk, as well as kits, plans and supplies.



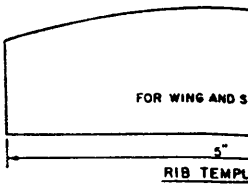
1. SOFT WORK BOARD
2. LAY PLAN OVER BOARD,
3. COVER PLAN WITH PLASTIC KITCHEN WRAP, (KEEPS FROM STICKING TO PLAN)
4. PIN DOWN STRAIGHT EDGES.
5. BLOCK 3/32" SQ. LEADING AND TRAILING EDGES AGAINST STRAIGHT EDGES.
6. HOLD WING RIB OVER PLAN AND TRIM TO EXACT LENGTH.
7. GLUE WING RIBS IN PLACE.
   APPLY COAT OF GLUE TO BOTH ENDS OF RIB AND EACH JOINT. LET SOAK IN FOR A FEW SECONDS. THEN APPLY ANOTHER COAT OF GLUE AND LOCATE IN PLACE ON PLAN.
   (THIS IS TYPICAL OF ALL GLUE JOINTS)
   (USE TOOTHPICK TO APPLY GLUE)
8. AFTER GLUE IS DRY, REMOVE STRAIGHT EDGES AND CAREFULLY REMOVE WING FROM PLAN

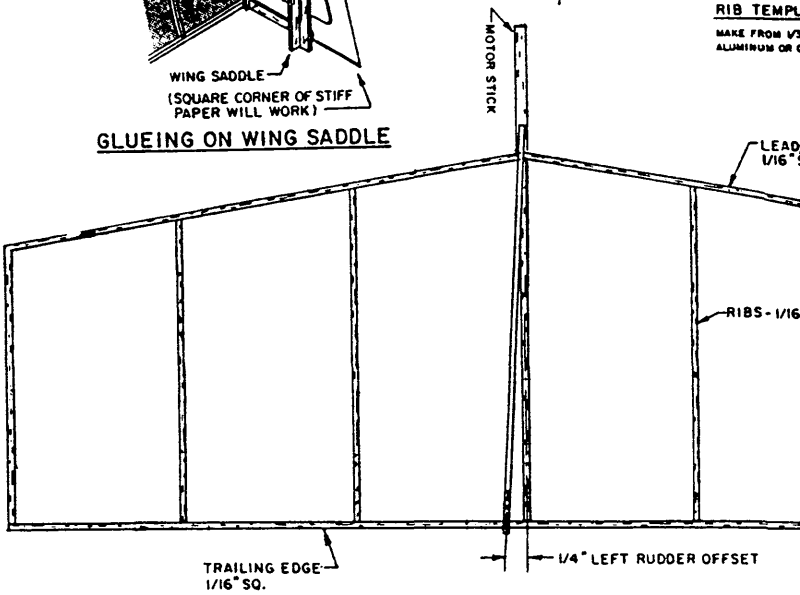
WING STRUCTURE

NOTE: TAIL IS BUILT SIMILAR

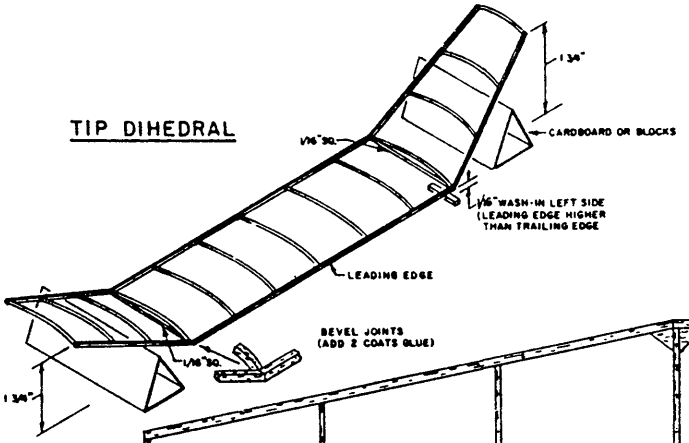


GLUEING ON WING SADDLE

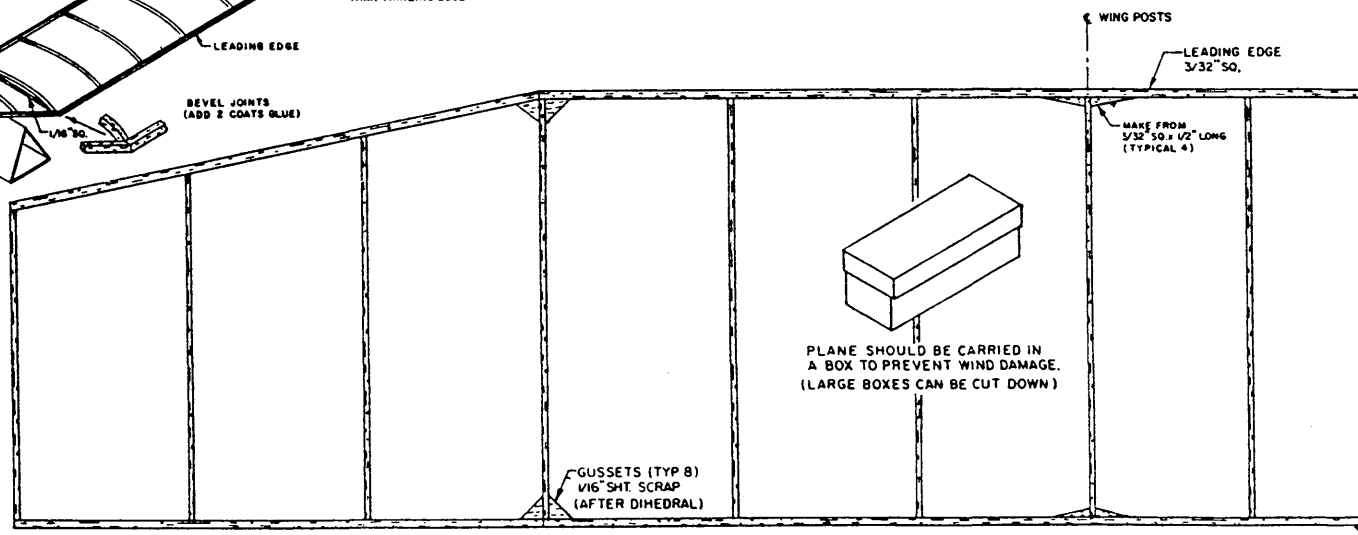




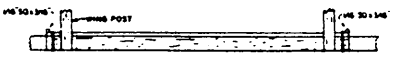
TAIL PLAN

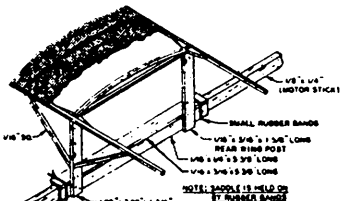


TIP DIHEDRAL

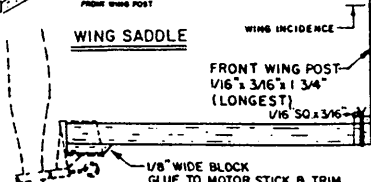


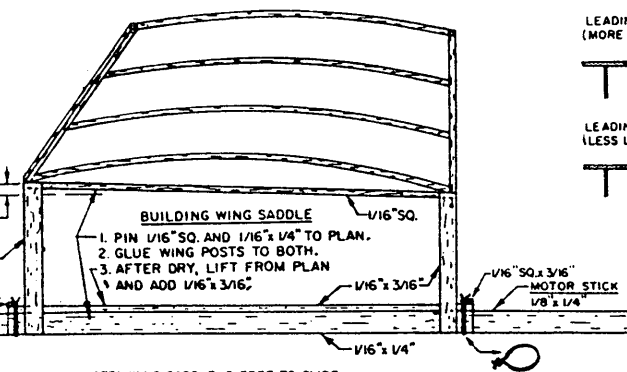
WING PLAN





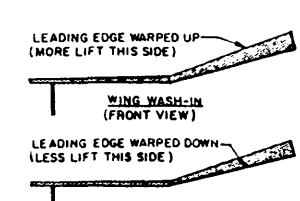
WING SADDLE





NOTE: WING SADDLE IS FREE TO SLIDE ALONG MOTOR STICK AND IS HELD IN PLACE BY SMALL RUBBER BANDS
(AFTER ADJUSTING FOR BEST FLYING POSITION, MARK POSITION OF WING SADDLE WITH FELT TIP PEN.)

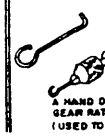
WING INCIDENCE MAY BE INCREASED OR DECREASED BY PLACING BALSA SHIMS UNDER FRONT OR REAR OF WING SADDLE.

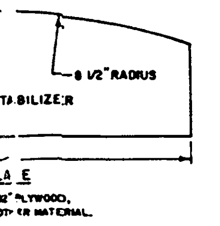


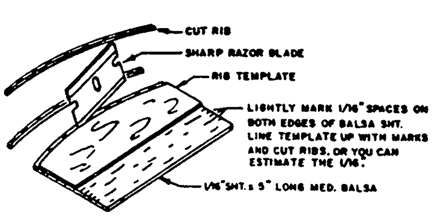
TYING RUBBER

FLYING SITES

GYMNASIUMS
ARMORIES
CHURCHES
AIRPLANE HANGERS
CONVENTION HALLS
AUDITORIUMS
SHOPPING MALLS
THEATERS







CUTTING WING AND TAIL RIBS

NOTE: ALL RIBS ARE CUT TOO LONG AND SHOULD BE INDIVIDUALLY TRIMMED TO FIT.

GENERAL NOTES

1. IT IS IMPORTANT TO OIL PROP SHAFT WITH LIGHT OIL.
2. FOR BEST RESULTS RUBBER SHOULD BE BROKEN IN AS FOLLOWS: STRETCH RUBBER ABOUT 3 LENGTHS AND HOLD FOR ABOUT 5 MIN.. RELAX RUBBER FOR ABOUT 3 MIN.. REPEAT 3 LENGTH STRETCH FOR 4 MIN.. LUBE WITH RUBBER LUBE AND FLY.
3. A 36" LOOP OF 3/32" RUBBER SHOULD TAKE AT LEAST 2500 WINDS WHICH SHOULD GIVE 2 MIN. PLUS FLIGHTS.

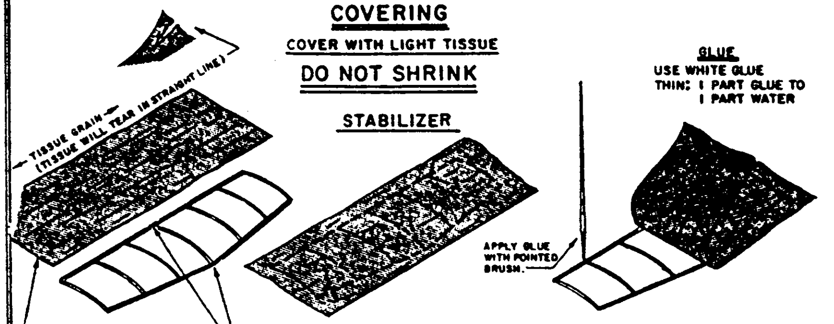
COVERING

COVER WITH LIGHT TISSUE

DO NOT SHRINK

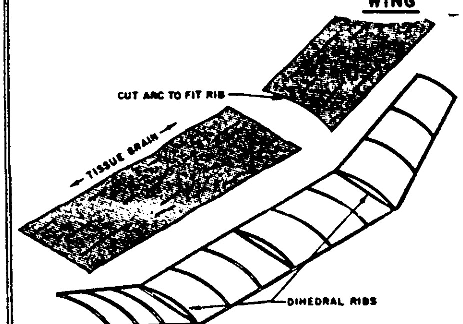
GLUE
USE WHITE GLUE
THIN: 1 PART GLUE TO 1 PART WATER

STABILIZER



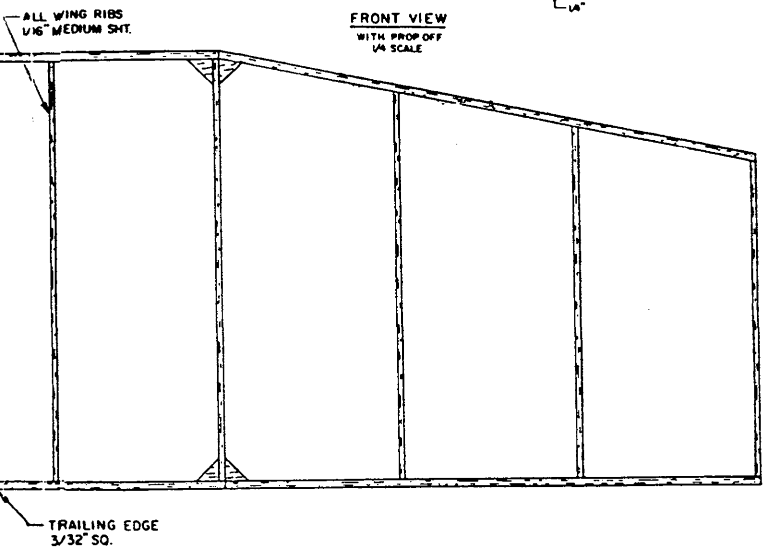
1. CUT OVER SIZE PIECE.
2. APPLY GLUE ABOUT 1/2" ALONG LEADING AND TRAILING EDGE.
3. LAY TISSUE OVER STRUCTURE AND STICK TO GLUE AREAS.
4. RAISE ONE END OF TISSUE AND APPLY GLUE TO LEADING EDGE, TRAILING EDGE AND TIP RIB.
5. CAREFULLY WORK TISSUE TOWARDS TIP RIB.
6. AFTER DRY TRIM WITH RAZOR BLADE.

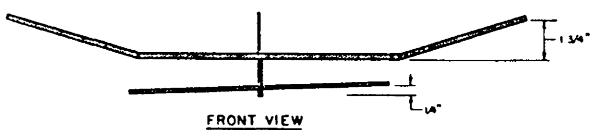
WING



1. CUT OVER SIZE TISSUE FOR CENTER SECTION.
2. BEGIN AT CENTER RIB AND PROCEED TO COVER FOLLOWING STABILIZER COVERING DIRECTIONS. (GLUE ONLY TO LEADING EDGE, TRAILING EDGE AND DIHEDRAL RIBS.)
3. AFTER DRY TRIM WITH RAZOR BLADE.
4. CUT OVER SIZE TISSUE FOR WING TIPS.
5. OVERLAP DIHEDRAL RIB 1/16" AND GLUE TO RIB, TIP RIB, LEADING AND TRAILING EDGES.

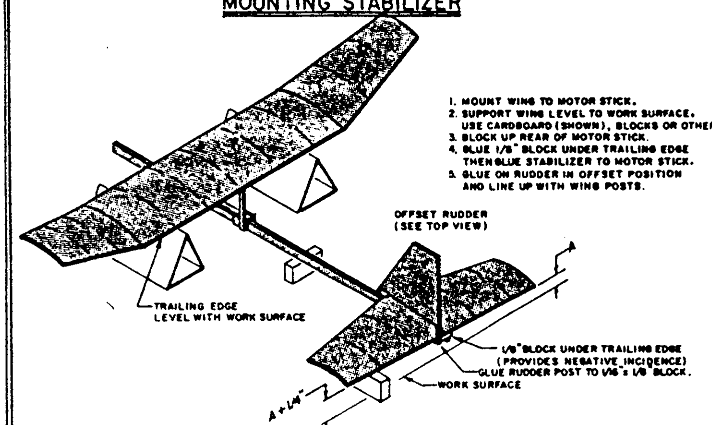
NOTE: RUDDER IS COVERED ON LEFT SIDE ONLY.





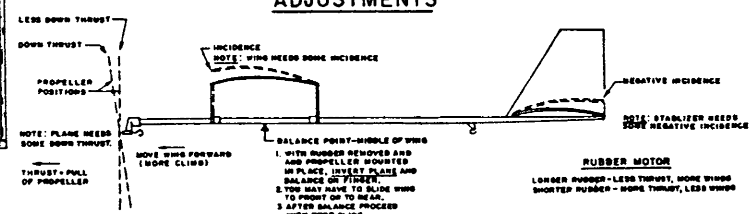
FRONT VIEW
WITH PROP OFF
1/4 SCALE

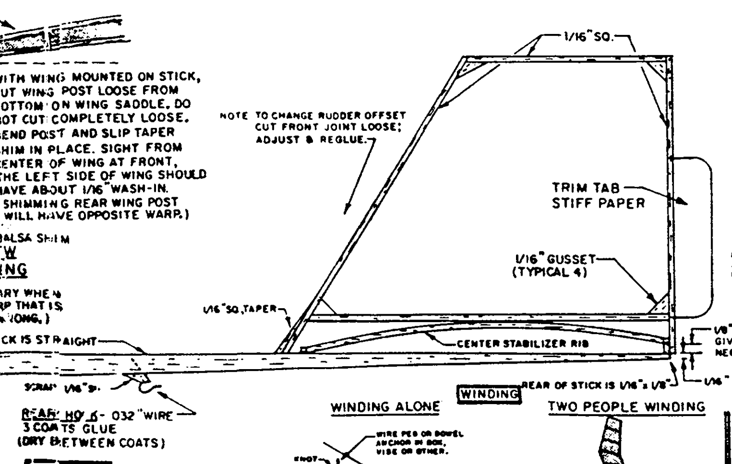
MOUNTING STABILIZER



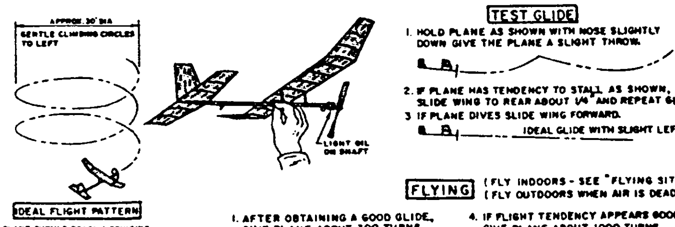
1. MOUNT WING TO MOTOR STICK.
2. SUPPORT WING LEVEL TO WORK SURFACE. USE CARDBOARD (SHOWN), BLOCKS OR OTHER.
3. BLOCK UP REAR OF MOTOR STICK.
4. GLUE 1/8" BLOCK UNDER TRAILING EDGE THEN GLUE STABILIZER TO MOTOR STICK.
5. GLUE ON RUDDER IN OFFSET POSITION AND LINE UP WITH WING POSTS.

ADJUSTMENTS





TEST GLIDE



1. HOLD PLANE AS SHOWN WITH NOSE SLIGHTLY DOWN GIVE THE PLANE A SLIGHT THROW.
2. IF PLANE HAS TENDENCY TO STALL AS SHOWN, SLIDE WING TO REAR ABOUT 1/4" AND REPEAT GLIDE.
3. IF PLANE DIVES SLIDE WING FORWARD.

IDEAL GLIDE WITH SLIGHT LEFT TURN.

IDEAL FLIGHT PATTERN

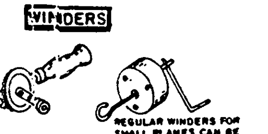
PLANE SHOULD REACH A CRUISING ALTITUDE USING ABOUT 1/3 OF TURNS. IT SHOULD FLY FOR A TIME AT THIS ALTITUDE AND GRADUALLY START TO DESCEND. THE PLANE SHOULD LAND WITH A FEW WINDS LEFT.

FLYING

(FLY INDOORS - SEE "FLYING SITES")
(FLY OUTDOORS WHEN AIR IS DEAD CALM.)

1. AFTER OBTAINING A GOOD GLIDE, GIVE PLANE ABOUT 300 TURNS.
2. HOLD PLANE AS SHOWN WITH NOSE SLIGHTLY UP, WITH OTHER HAND HOLDING PROP. RELEASE PROP AND LIGHTLY LAUNCH PLANE.
3. IF PLANE HAS TENDENCY TO STALL SLIDE WING TO REAR ABOUT 1/4". IF PLANE DIVES OR DOES NOT CLIMB ENOUGH, SLIDE WING FORWARD.
4. IF FLIGHT TENDENCY APPEARS GOOD GIVE PLANE ABOUT 1000 TURNS.
5. PROCEED TO FLY AND ADJUST. KEEP ADDING WINDS AND FLYING.
6. AFTER RUBBER IS BROKE IN YOU SHOULD GET 2500 TO 3000 TURNS ON A 36" LOOP OF 3/32" RUBBER.
7. LONGER RUBBER YIELDS LESS THRUST, LESS CLIMB, MORE TURNS.
8. SHORTER RUBBER YIELDS MORE THRUST, MORE CLIMB, LESS TURNS.

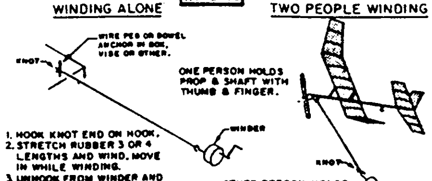
WINDERS



WINDING

WINDING ALONE

TWO PEOPLE WINDING



1. HOOK KNOT END ON HOOK.
2. STRETCH RUBBER 3 OR 4 LENGTHS AND WIND, MOVE IN WHILE WINDING.
3. UNHOOK FROM WINDER AND HOOK TO PROP SHAFT WHILE HOLDING PROP, HOOK OTHER END.

OTHER PERSON HOLDS WINDER, STRETCHES RUBBER ABOUT 3 LENGTHS AND WINDS, MOVE TOWARD

GLUES

1. FRANKLINS HOME SHOP & CRAFT GLUE (WOOD - 2 PARTS GLUE TO 1 PART WATER, COVERING - 1 PART GLUE TO 1 PART WATER)
2. TITEBOND GLUE
3. MICRO-X ULTRA CEMENT
4. TESTORS FAST DRYING CEMENT FOR WOOD
5. AMBROID CEMENT
6. DUCO CEMENT

NOTE: THERE ARE OTHER GLUES WHICH WILL WORK. USE TOOTHPICK TO APPLY GLUE TO WOOD.

GLUING WOOD JOINTS

1. COAT EACH PIECE TO BE JOINED WITH LIGHT COAT OF GLUE AND LET SOAK IN FOR A FEW SECONDS.
2. APPLY A SECOND COAT OF GLUE AND JOIN PIECES.

WOOD

ALL BALSA

TOOLS

SOFT WORK BOARD, RAZOR BLADES, STRAIGHT PINS, GLUE, SANDPAPER, LONG NOSE CUTTING PLIERS, POINTED BRUSH, PLASTIC WRAP, SCISSORS

MANY THANKS TO LES SHAW WHO SUGGESTED THIS PLANE AND AIDED IN PLANES DESIGN.

MACE MODEL AIRCRAFT CO.
TULSA, OKLAHOMA

P-24 "CONDOR"

WING SPAN - 24" LENGTH - 23 5/8"
WING AREA - 115 sq. in. STABILIZER AREA - 45 sq. in.
RUDDER AREA - 10 sq. in.

RUBBER STRETCH TESTING

by Howard Henderson

Since rubber is the life blood of this hobby, I guess it is natural that we should talk about it a lot. Much has already been written on rubber, but since we now have the new stuff, maybe somebody will be inspired to write about how to get the most from it.

In this issue, we are including one method of testing rubber. Most old-time rubber flyers have developed their own method. However, it is still common for people to hand me a piece of rubber to test. (As if I have the only know-how around here! Hi!) The enclosed sample test sheet, in full size, may be copied and used as-is. The equipment required couldn't be more simple.

A 1"x2" board, 6' long, with a large headed nail (protected by fuel linetubing) about 2" from one end is used as an anchor for the test rubber. An old measuring tape is strapped to the board. It would be slightly better, if it read in tenths of an inch, but a standard scale is o.k. Interpolation can be made to tenths. All test pieces are 1/8" wide loops 5 1/2" to 6" long, tied with your favorite knot. Pre-stretch it, if you wish. I'm not sure TAN II benefits a lot from it. There are a variety of opinions on this. My experience with the old TAN I was that it got better each time it was used, if it got a 1/2 to 1 hour rest.

We have a 10 lb. fish-scale by "Normark", which has worked fine to do the stretching. They are inexpensive at the discount fishing departments. It has a guaranteed accuracy of about 2 oz. giving a little over 1% full scale, but we have found them to be better than that. The digital read-out helps. If you are in doubt, you can get a couple of calibration points by taking a couple cans of bolts to your friend with an "O Hous" or a digital scale at the post office.

How far do you pull this sample? To what percent of the average breaking point should it be pulled?

TAN II gets pretty hard at 10 lbs. and if you want to know how much total energy there is in the stuff, go to 10 lbs.. We used to take TAN I to 8 lbs. and quit. Relatively speaking, that is good enough to tell you how good the rubber really is.

Hold the test board in a good vise. Set a tape recorder up and pull the rubber to your max load and call out the deflection every pound as you relax the tension (After 4 lbs, every 1 lb, 8 oz.)

Plot this on the sample graph. If you do not want to test this sample again later, cut off the knot with a razor, while the rubber is in tension, and weigh it. It should be close to 1 gram. The area under the curve is determined by adding a succession of elements as shown by the example. ([28-24] x 1.5 = 6.0 in lbs.

by the weight in grams will give you the energy in ft. lbs. per lb.

Many indoor models can't use the last portion, an example being the cross-hatched area shown. If you start comparing the energy without that portion, it could be more meaningful for indoor use. What do you think? Chris Matsuno tells me they use everything they can get for F1B. However, I've heard some old-time outdoor modelers don't torture the rubber that much, particularly in the SAM events. Incidentally, a piece of very creamy TAN II given to me a J.C. tested over 4200 ft. lbs./lb! Nothing I've seen has been as good.

What portion of the curve you might cross hatch, when comparing data is subject to debate, I suppose. All rubber testing here is done in the basement at a pretty uniform temperature year round.

. . . . . RUBBER STRETCH TEST

Date 6-22-93

Prestretch? small amount Sample size 6", 1/8", 5 strands

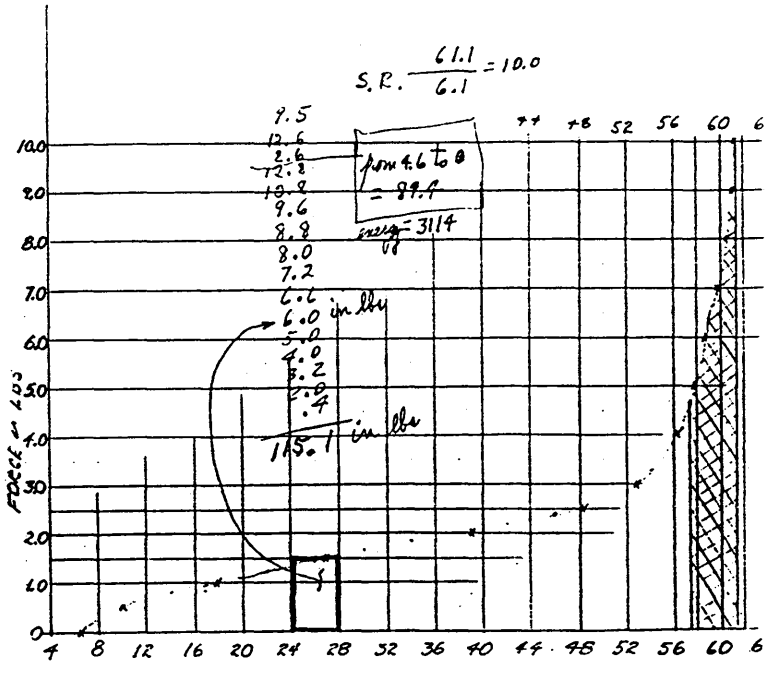
Rubber type Fnl TAN II Date obtained 6-22-93

Determine "A" (area under curve) 115.1 in lbs ____ in lbs

Weight of sample 1.085 g Secomd test ____

Energy = "A" X 16 X 28.35 / Wt(g)X12 ; or 37.8 X "A"/Wt(g)= ____ Second test ____

ENERGY; first test 4010 second test ____



Telephone: 0257 452624.

403 Mossy Lea Road.
Wrightington.
Wigan,
Lancs., England.
WN6 9SB.
2/5/94.

Dear Indoor Flyer.

First of all thank you for entering the forth Living Room Stick Postal Contest. Please find below the full classified results. I hope you all had FUN in flying this little model and I hope you will enter next year's event which will start on the **1st January 1995.**

LIVING ROOM STICK POSTAL CONTEST 94 RESULTS.

Contestants Name.	Country	Site Ceiling Height in Ft.	Best Actual Time in Sec.	Corrected Time.	Place Overall & (Class)
W. Van Gorder	U.S.A.	23.25	552	901.36	OVERALL CHAMP
J. O'Donnell	U.K.	9.33	422	860.38	2 (1st U.K.)
W. Van Gorder	U.S.A.	17.92	504	873.65	3
W. Van Gorder	U.S.A.	22.04	521	853.02	4
L. Coslick	U.S.A.	9.00	410	842.85	5 (1st Int.)
W. Van Gorder	U.S.A.	13.33	445	832.96	6
L. Mzik	U.S.A.	20.00	492	827.66	7 (2nd Int.)
V. Hacker	U.S.A.	20.00	492	827.66	7 (Joint)
R. Lotz	Germany	7.48	385	824.41	8 (3nd Int.)
B. J. Hunt	U.K.	24.83	510	807.03	9 (2nd U.K.)
A. Abell	U.K.	7.67	374	796.61	10 (3rd U.K.)
D. Yates	U.K.	9.33	387	789.02	11
R. Eberle	U.S.A.	8.00	373	787.16	12
T. Yatabe	Japan	29.52	513	771.48	13
L. Mzik	U.S.A.	30.00	510	763.26	14
S. Nonaka	Japan	29.52	503	756.44	15
A. Cromberg	Argentina	9.80	373	751.99	16
T. Vallee	U.S.A.	18.60	430	737.87	17
J. Clem	U.S.A.	23.00	455	736.01	18
S. Takeuti	Japan	25.94	463	723.43	19
J. Kagan	U.S.A.	18.00	414	716.75	20
K. Hasimoto	Japan	29.52	471	708.32	21
R. Miller	U.S.A.	30.00	470	703.40	22
J. F. Frugoli	France	8.30	336	703.35	23
K. Kihara	Japan	29.52	466	700.80	24
Y. Sugi	Japan	25.94	446	696.87	25
Y. Sugi	Japan	29.52	460	691.77	26
R. White	U.S.A.	9.00	334	686.62	27
M. Thompson	U.S.A.	30.00	453	677.96	28
K. Kihara	Japan	29.52	448	673.73	29
T. Yatabe	Japan	29.52	446	670.72	30 (Joint)
M. Aosima	Japan	29.52	446	670.72	30 (Joint)
A. E. Hares	U.K.	7.813	315	668.21	31
D. Barry	U.S.A.	21.00	399	662.19	32
M. Thomas	Canada	9.25	323	659.89	33
D. Belieff	U.S.A.	18.60	381	653.79	34

Y. Sugi	Japan	29.52	434	652.67	35	
Y. Sugi	Japan	29.52	430	646.66	36	
L. Loucka	U.S.A.	30.00	430	643.53	37	
C. Banks	U.S.A.	23.20	393	634.16	38	
H. Ofterdinger	Germany	7.48	291	623.13	39	
V. Hacker	U.S.A.	30.00	415	621.08	40	
D. Robelen	U.S.A.	26.00	397	619.89	41	
K. Hara	Japan	25.94	393	614.06	42	
Y. Tawaka	Japan	29.52	406	610.57	43	
Z. Fuziwara	Japan	29.52	405	609.06	44	
Y. Tanaka	Japan	29.52	404	607.56	45	
W. Baker	U.S.A.	18.60	347	595.45	46	
M. Thomas	Canada	18.833	348	595.14	47	
Z. Fuziwara	Japan	29.52	392	589.51	48	
S. Tamai	Japan	29.52	388	583.50	49	
H. Motegi	Japan	29.52	387	581.99	50	
Z. Fudiwara	Japan	29.52	383	575.98	51	
S. Tamai	Japan	29.52	381	572.97	52	
K. Komura	Japan	29.52	377	566.95	53	
M. Fukuda	Japan	25.94	360	562.49	54	
M. Yamanasi	Japan	29.52	372	559.43	55	
R. Weisman	U.S.A.	18.60	321	550.83	56	
K. Komura	Japan	29.52	366	550.41	57	
M. Yamanasi	Japan	29.52	365	548.91	58	
R. Harada	Japan	29.52	361	542.89	59	(Joint)
S. Takeuti	Japan	29.52	361	542.89	59	(Joint)
R. Platt	U.S.A.	26.00	345	538.69	60	
C. Westerman	U.K.	19.50	314	532.92	61	
D. Deller	Canada	9.25	260	531.18	62	
T. Sova	U.S.A.	30.00	349	522.31	63	
M. Osima	Japan	29.94	327	510.93	64	
K. Hara	Japan	25.94	326	490.26	65	
F. Takagi	U.S.A.	23.20	301	485.70	66	
K. Komura	Japan	29.52	316	475.22	67	
T. Tudi	Japan	29.52	315	473.71	68	
S. Takeuti	Japan	29.52	310	466.20	69	
J. Diebolt	U.S.A.	26.00	296	462.18	70	
J. Williamson	U.S.A.	30.00	303	453.47	71	
J. Triana	U.S.A.	21.00	270	448.10	72	
H. Inoue	Japan	25.94	296	445.14	73	
T. Vallee	U.S.A.	7.92	209	442.07	74	
M. Fukuda	Japan	25.94	292	439.13	75	
K. Halsas	Finland	22.97	263	425.59	76	
D. Belieff	U.S.A.	7.92	201	425.15	77	
H. Tamura	Japan	25.94	281	422.58	78	
H. Kurihara	Japan	25.94	269	420.31	79	
F. Breisch	U.S.A.	30.00	278	416.05	80	
H. Kurihara	Japan	25.94	268	403.03	81	
W. Collins	U.S.A.	26.00	256	399.73	82	
P. Brocks	U.S.A.	26.00	253	395.04	83	
H. Inoue	Japan	25.94	249	389.06	84	
Y. Ikeda	Japan	25.94	256	384.97	85	
D. Nakao	Japan	25.94	252	378.97	86	
D. Braun	U.S.A.	8.33	181	378.59	87	
T. Westlin	Finland	22.97	231	373.81	88	
R. Eberle	U.S.A.	7.25	173	372.93	89	
J. Wackers	(J)Holland	8.00	176	371.42	90	

D. Braun	U.S.A.	21.00	199	330.26	91
A. Tatimori	Japan	25.94	214	321.83	92
H. Phillips	U.S.A.	26.00	204	318.53	93
D. Henshaw	U.S.A.	30.00	212	317.28	94
F. VanHauwaert	Belgium	29.00	204	308.42	95
E. Sullivan	U.S.A.	26.00	176	290.43	96
J. W. Alling	U.S.A.	23.20	178	287.23	97
W. Booth	U.S.A.	23.20	175	282.39	98
P. Owen	U.S.A.	21.00	168	278.82	99
F. Baird	U.S.A.	18.60	161	276.27	100
A. Petit	Belgium	29.00	165	249.46	101
T. Westlin	Finland	8.10	117	246.24	102
A. Breisch	U.S.A.	30.00	159	237.96	103
A. Petersen	U.S.A.	21.00	138	229.03	104
R. Weisman	U.S.A.	7.92	75	158.64	105

To save you counting here are some of the vital statistics of this year's event. A total of 85 entrants posted 264 competative flights. Flyers from 10 countries flew in sites ranging from 30 feet down to 7.25 feet.

Prizes will be sent to the overall champion and to the top three in international class and U.K. class. No contestant will receive more than one prize. Well that is just about it for now.

Thermals for ever even Indoors.

Mike Colling

Mike Colling
BMFA Indoor Technical Committee Chairman.

. . . . . RUBBER STRETCH TEST

Date_____

Prestretch?_____ Sample size_____

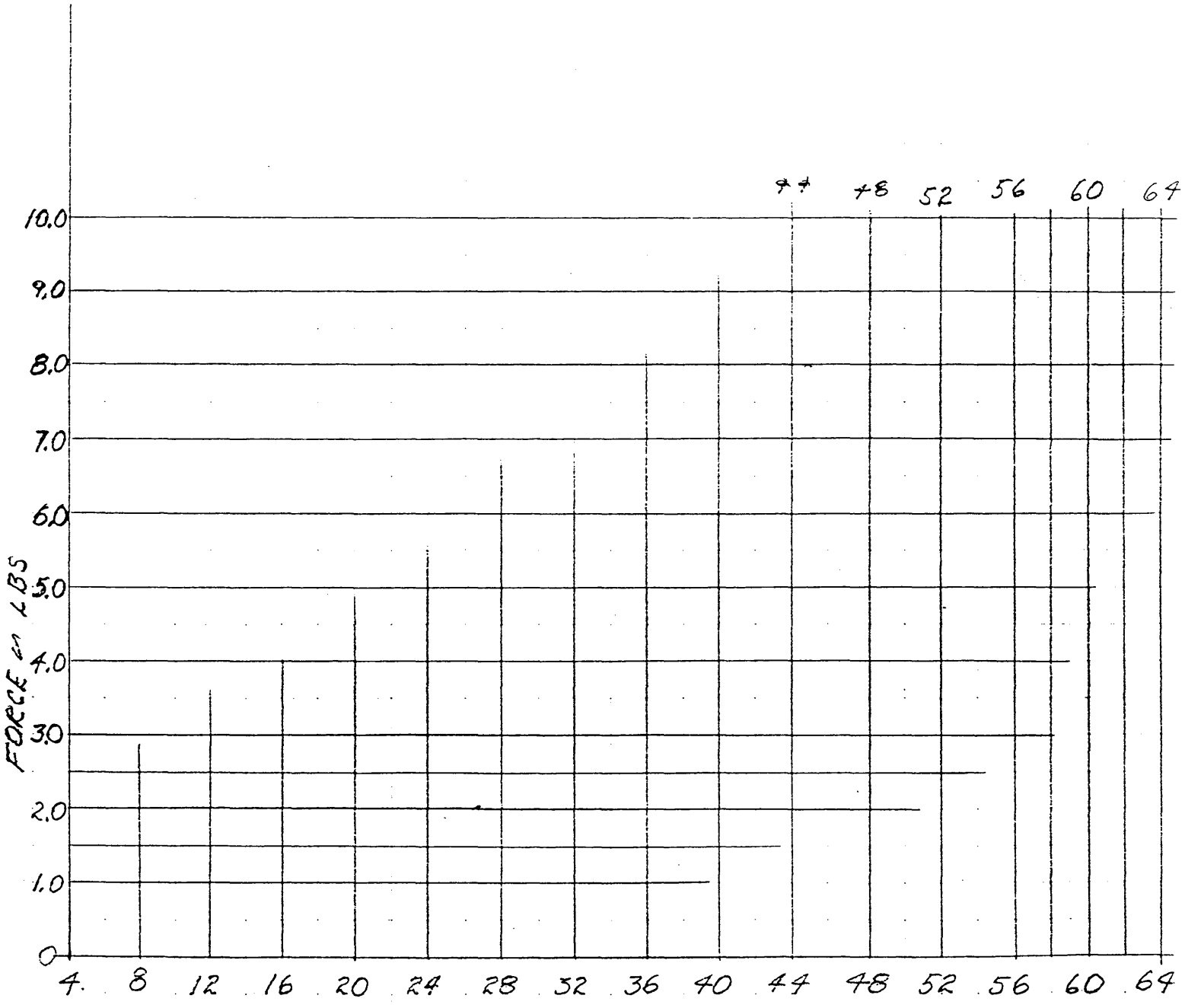
Rubber type_____ Date obtained_____

Determine "A" {area under curve} _____in lbs _____in lbs

Weight of sample_____ Secomd test_____

Energy = "A" X 16 X 28.35 / Wt{g}X12 ; or 37.8 X "A"/Wt{g}=_____
Second test=_____

ENERGY; first test_____ second test_____



INDOOR
NEWS and VIEWS

Indoor News And Views
1025 Cedar Street
Catawissa MO 63015

TROUBLE AT JOHNSON CITY

WE HAVE LEARNED THAT A NUMBER OF CONTESTANTS AT THE JUNE 1994 USIC CAUSED SOME PROBLEMS THAT DAMAGED OUR RELATIONSHIP WITH THE PEOPLE AT EAST TENNESSEE STATE UNIVERSITY.

THE MINI-DOME IS A GREAT SITE FOR FLYING, SO WE ARE ANXIOUS TO MEND OUR RELATIONSHIP WITH ETSU. WE SINCERELY HOPE THAT IT WILL NOT HAPPEN AGAIN. WE ASK EVERYONE TO PLEASE COOPERATE.

INDOOR
NEWS and VIEWS

1025 Cedar Street
Catawissa, MO 63015

ISSUE 2 - JULY, 1994 7 7·78·79

EDITORIAL
By
MARY JANE REILLY

EXTRA! EXTRA! EXTRA!

Our hero, LARRY COSLICK does it again!

At the USIC in Johnson City, Tennessee in June, he won nine awards, plus the coveted Grand Champion Award!

In Akron, Ohio in the blimp hangar on July 2 & 3, he established two new national records. On July 2, he flew an incredible thirty minutes and six seconds (30.06) with his EZB! Then, on July 3, he flew an outstanding thirty seven minutes and twenty six seconds (37.26) with his Intermediate Stick! We are so proud of him!

When asked how he did it, he replied in his usual modest, unassuming manner:

"Well, I arrived at the airlock around 1 pm and after I was there about 1/2 hour, I heard thunder in the distance. My plan was to fly EZB the first day because I had to do some assembly work on the two Intermediate Stick models that I brought to get them ready.

By the time I had the EZB put together and a 1/4 motor selected, it was getting darker by the minute inside the building. I used a 3 3/4 inch loop of .048 TAN II rubber and launched at a torque of .2 inch ounce. With this size loop, it normally would climb to around 30 feet; but this time it climbed to between 50 or 60 feet and dead-sticked at 7:28 minutes, and the model was still 20 feet up. I tied up a new loop 4 1/8 inches and .045 wide and launched it with the same torque. I use black "O" rings and it was getting so dark inside that I could hardly see to hook up the motor. The rain was really coming down by then and there were several major leaks towards the West wall. This time, the model climbed toward 40 feet and flew all the way down at around 7:30 minutes.

I was ready for the first official flight, but it was so dark inside that we had trouble seeing the ceiling and we decided that it was too chancy to launch at this time. After about 45 minutes, it started to lighten up and the air was still very buoyant. The temperature had dropped from 80 degrees to 76 degrees and the humidity was on the rise.

I got two timers and put 2680 turns into the motor and then backed off about 40 turns to 2640. I noticed there had been a slight drift from East to West, so I launched it toward the East side. I used a 16 1/2 inch loop with .2 inch oz. torque. The model climbed quickly at first and when it got to 130 feet, it started to drift toward the center of the building. When it finished the climb, at around 175 feet, it was perfectly centered just under the ceiling with no touches. After a long cruise, it started to drift South and then a little toward the East side again. It was never in any danger of striking anything and landed around 150 feet South of where I launched it, with around 20 knots left. The time was thirty minutes and six seconds (30.06)."

Outstanding! Was he born to fly, or what? We think so. We also think it couldn't happen to a nicer guy.

****

The staff of INAV will certainly be busy for the 1994-95 season. Along with publishing an international newsletter, we have decided to take charge of the U.S.I.C. at Johnson City, Tennessee. ROY WHITE will be your Contest Director.

ATTENTION GUYS:

Our Facilities Director, GARY UNDERWOOD will negotiate five days for the 1995 USIC. We plan to use Monday for a controlled practice day. Also on Monday, we will have a P-24 mass launch at high noon. The last ten planes to land will have a flyoff. The last five of these planes will have a flyoff, and finally, the last two will have a flyoff for a winner. Tuesday through Friday will be competition days. This will enable us to reschedule some of the events so that our Senior Citizens won't have such a long day.

ATTENTION GALS:

We have made arrangements for the banquet to be held in the newly remodeled ballroom of the Buffalo Hills Country Club on Thursday evening. Located 5 miles from the Mini-Dome, it boasts a lovely swimming pool and an 18 hole golf course. The views are breathtaking! We have reserved a block of rooms at the special rate of $29.77 (any number of persons in room). First come, first served. As soon as possible, please let us know if you would like to reserve a room. They will go fast. Some are already spoken for. We promise you a large variety of delicious food, desserts, soft drinks and excellent service. A cash bar is located adjacent to the ballroom.

ATTENTION ADVERTISERS, SPONSORS & FLYING CLUBS:

We plan to have a Handout Program for the contest at U.S.I.C. If you wish to sponsor an event, advertise or donate money, your name will appear in the program. Call or write and we will quote the prices.

Thanks to all of those who have already contributed. Checks should be made payable to U.S.I.C. and mailed to:

ROY WHITE
1025 Cedar Street
Catawissa, MO 63015

We have returned all outdated checks to you. Your new checks are arriving and our records are posted. We hope that everyone is covered.

Regarding the numbering system, the last issue should have been 74-75-76 and this issue 77-78-79. The system for expiration notices will be evolving as renewals are received. Your expiration date will appear on the mailing label.

Indoor Flying Models by LEW GITLOW is well-written and easy to understand. To order send $25.00 to:

Lew Gitlow
Box 3511
Salem, Oregon 97304

Many thanks to PLENNY BATES for all the pictures he took and had printed for us. We appreciate it very much. Thanks also to the DOIGs for the instant results and the advice offered. MARY JANE REILLY'S flying fingers will certainly help with typing at USIC in 1995.

Someone always has an intriguing gadget at contests.

PHIL SMITH
2662 Sharon Dr.
Adrian, MI. 49221
517-263-4573

has been experimenting with a method of indoor control of a small electric airplane using a pulsed infra-red signal for guidance of small airplanes (scale, coconut, etc.). In small gyms, a crash into a wall can be discouraging. Phil would like to talk with any electronics experimenters. We have been locked into rubber power for years, but there is no reason why CO 2 or electric should not be considered when technology permits.

****

TAN II

By Larry Coslick

What a difference a year makes when it comes to rubber. Several modelers used TAN II at the 1993 USIC and their times reflected its fantastic energy. Everyone made a scramble to get their hands on it. Check the record books and just look at the times posted at the 1994 USIC. Would you believe 37 minutes in Intermediate Stick? Five of the fliers with over five minutes in Bostonian? Twelve contestants with over 21 minutes in EZB? All this, and most of us are still just learning how to use it.

I have made a comparison test on three batches of TAN II. (6/93, 8/93 and the latest 5/94.) Test motors were stripped .045 wide and made 18" long. By weight, each motor was within 5% of each other. The motors were wound a total of two times each to a torque of .4 with a one hour rest between winds. The air temperature was 83 degrees F and 60% humidity and Son-of-a-Gun was used as a lubricant.

One hour after the last wind, each motor was measured and each had stretched 5/8". The motors were inspected for chafe marks and the 6/93 motor came out the best, with very slight cuts near the knot. The 8/93 motor had major cuts at the knot. The 5/94 motor fared slightly better than the 8/93 batch. Refer to Chart #1 Comparison Test.

****

TAN II WIND TEST

	TAN II BATCH 6/93	WIND 1	MAX TORQUE	1/2 WINDS TORQUE	WIND II	MAX TORQUE	1/2 WINDS TORQUE	PINKISH BEIGE COLOR
		2680	.4	.06	2820	.4	.07	VERY SLIGHT TEARS AT KNOT
	TAN II BATCH 8/93	WIND I	MAX TORQUE	1/2 WINDS TORQUE	WIND II	MAX TORQUE	1/2 WINDS TORQUE	PINKISH WHITE OR FLESH COLOR
		2860	.4	.07	2980	.4	.07	MAJOR TEARS AT KNOT
	TAN II BATCH 5/94	WIND I	MAX TORQUE	1/2 WINDS TORQUE	WIND II	MAX TORQUE	1/2 WINDS TORQUE	LIGHT TAN COLOR
		2620	.4	.065	2760	.4	.07	SLIGHT TEARS AT KNOT

MEMORIAL FOR
BOYD FELSTEAD
By
MANNY RADOFF

In late 1971, I asked Boyd to enter the 1972 W.C., so I could be his proxy and have the thrill of flying with the great ones. This began a correspondence in which I told him all I knew about F1D construction. After this experience, Boyd's thirst for indoor knowledge was unquenchable. Eventually, he told me that he corresponded with 21 indoor builders. In 1973, my wife and I visited Australia and Boyd came to the airport to see a real live indoor modeler. He aroused indoor interest in Australia and actually got one Wakefield flyer (Richard Blackham) to build and become proficient in F1D.

Some years later, Boyd decided to enter the W.C. himself, combined with a trip around the world. He flew at Santa Ana, Lakehurst, Akron and Cardington, then Eastward stopping in world capitols on the way home. He won most microfilm events in Australia, except when Lady Luck was against him. From what he wrote and the pictures he sent, I believe he could have been a world-class competitor if he could have flown at Santa Ana, Akron, Lakehurst or Cardington regularly. He often expressed a desire to fly in our airlocks.

Boyd was a good friend and pen-pal. I would tell him of flyers at Lakehurst and he would keep me informed of doings and techniques of the F1D flyers at Santa Ana, Akron and even Cardington. Many a time the phone would ring, "Boyd here". He would have some hot news or need something that I could personally do or get for him here in the States. His last request was for two of my special glue guns.

I will miss his gentle jibes because I didn't use his ideas and techniques; his improved F1D wing and tail building and covering boards; his improved F1D wing bracing jig; his willingness to share ideas and even the scarce Pirelli before the new TAN I & TAN II.

I will miss his enthusiasm. I will miss a good friend. The world will miss a good fellow, a good indoor modeler. There will be a void for many of us.

(Edited)

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1994 USIC — EASY B - #206

CONTESTANT	AMA #	1	2	3	4	5	BEST FLIGHT	PLACE	GRAND CHAMP POINTS
Larry Coslick	404651	00:25:47	00:09:09	-	-	-	00:25:47	1	100.00
Don Slusarczyk	5490	00:20:47	00:19:38	00:24:44	-	-	00:24:44	2	95.93
Mike Thomas	MAAC #1964	00:22:43	00:06:30	00:24:43	-	-	00:24:43	3	95.86
Bernard Hunt	SMAE# 56209	00:19:59	00:22:44	00:23:18	00:24:13	00:23:55	00:24:13	4	93.92
Bob Eberle	411591	00:18:57	00:22:55	00:18:01	00:23:48	00:23:23	00:23:48	5	92.31
Walter Van Gorder	19912	00:15:46	00:21:08	00:23:10	00:19:09	00:18:42	00:23:10	6	89.85
Howard Henderson	302944	00:21:26	00:22:33	00:19:40	00:22:27	-	00:22:33	7	87.46
Jack McGillivray	MAAC# 1025L	00:08:30	00:10:21	00:19:39	00:22:13	-	00:22:13	8	86.17
Jim Richmond	4936	00:21:56	00:19:45	-	-	-	00:21:56	9	85.07
Larry Cailliau	79985	00:20:25	00:21:20	00:21:44	00:07:25	-	00:21:44	10	84.29
Michael Thompson	1484	00:21:15	00:19:40	-	-	-	00:21:15	11	82.42
Walter Eggert	292	00:21:10	-	-	-	-	00:21:10	12	82.09
John Marett	MAAC# 651L	00:16:52	00:20:25	00:06:35	-	-	00:20:25	13	79.25
Stuart Weckerly	13250	00:16:09	00:19:11	00:07:43	00:20:16	00:17:27	00:20:16	14	78.60
Manny Radoff	28833	00:18:05	00:05:14	00:20:02	-	-	00:20:02	15	77.70
Vladimir Linardic (SR)	MAAC #38165-J	00:19:11	00:18:00	00:19:40	00:12:52	-	00:19:40	16	76.28
John Kagan	469254	00:18:03	00:19:35	00:15:30	-	-	00:19:35	17	75.95
Jon Vancil	338494	00:15:02	00:16:23	00:18:20	00:16:57	00:19:24	00:19:24	18	75.24
Dick Hardcastle	847	00:05:20	00:18:50	-	-	-	00:18:50	19	73.04
Doug Deller	MAAC #15800	00:14:41	00:18:45	00:03:41	00:14:32	00:17:26	00:18:45	20	72.72
Anthony D'Alessandro	1316	00:18:09	00:18:39	-	-	-	00:18:39	21	72.33
Larry Mzik	3687	00:13:58	00:15:21	00:18:35	00:07:38	-	00:18:35	22	72.07
Dan Belieff	12816	00:18:17	00:08:44	-	-	-	00:18:17	23	70.91
Tom Vallee	1126	00:18:02	00:18:16	00:17:58	00:04:04	-	00:18:16	24	70.85
Jack Archibald	192711	00:17:05	00:18:10	-	-	-	00:18:10	25	70.46
Mark Vancil	124866	00:18:08	-	-	-	-	00:18:08	26	70.33
John Fellin	95353	00:13:37	00:17:37	00:11:08	00:08:44	-	00:17:37	27	68.33
John Ganser	179424	00:07:27	00:12:30	00:15:27	00:17:26	00:14:31	00:17:26	28	67.61
Rob Romash	130061	00:17:00	00:17:26	-	-	-	00:17:26	29	67.61
John Barker	2095	00:11:11	00:11:30	00:16:13	00:14:48	00:17:24	00:17:24	30	67.49
Dave Robelen	12555	00:02:05	00:15:44	00:17:24	00:13:32	00:15:39	00:17:24	31	67.49
Dan O'Grady	MAAC# 6192	00:17:23	00:08:44	00:09:39	-	-	00:17:23	32	67.42
Jim Clem	L-55	00:14:08	00:17:20	00:16:59	00:16:37	00:16:23	00:17:20	33	67.23
Ted Seaver	397891	00:15:40	00:16:18	00:17:01	-	-	00:17:01	34	66.00
Louis Leifer	MAAC# 2418L	00:12:01	00:15:05	00:13:42	00:16:45	00:12:44	00:16:45	35	64.96
Jesse Shepherd, Sr	4257	00:16:06	00:09:47	00:14:58	00:13:12	-	00:16:06	36	62.44
Tony Italiano	2386	00:02:35	00:08:25	00:01:25	00:15:45	ATT	00:15:45	37	61.09
Fred Rash	63458	00:15:40	00:14:42	00:14:09	00:12:27	-	00:15:40	38	60.76
James Zufelt	MAAC# 945	00:09:10	00:14:55	00:05:42	00:09:13	00:13:35	00:14:55	39	57.85
Len Singer	209081	00:12:47	00:11:39	00:14:44	-	-	00:14:44	40	57.14
John Diebolt	97263	00:11:58	00:14:35	-	-	-	00:14:35	41	56.56
Vernon Hacker	44137	00:12:42	00:14:02	00:13:04	00:13:00	00:12:30	00:14:02	42	54.43
Karl Von Bueren	51477	00:12:15	00:12:36	-	-	-	00:12:36	43	48.87
John Chizmadia	33580	00:07:23	00:10:52	00:12:22	-	-	00:12:22	44	47.96
Dick Obarski	560	00:12:03	00:03:52	00:08:07	-	-	00:12:03	45	46.74
Abram Van Dover	894	00:11:51	00:11:44	00:10:21	-	-	00:11:51	46	45.96
Peter Olshefsky	MAAC #864-L	00:10:26	00:11:17	00:10:06	00:10:49	00:09:35	00:11:17	47	43.76
Phillip Hartman	8667	00:09:49	00:10:32	-	-	-	00:10:32	48	40.85

1994 USIC — EASY B - #206

CONTESTANT	AMA #	1	2	3	4	5	BEST FLIGHT	PLACE	GRAND CHAMP POINTS
David Raymond-Jones	MAAC #13157	00:07:10	00:08:23	att	00:09:16	-	00:09:16	49	35.94
Stan Chilton	L-30	00:08:20	-	-	-	-	00:08:20	50	32.32
Chuck Slusarczyk	2643	00:07:38	-	-	-	-	00:07:38	51	29.61
Doug Barber	56270	00:07:28	-	-	-	-	00:07:28	52	28.96
Dave Henshaw	MAAC #2261	00:05:32	00:05:36	00:06:00	00:05:32	00:06:00	00:06:00	53	23.27
Chester Wrzos	20454	-	-	-	-	-	00:00:00	54	0.00
Joseph Nuszer	29036	-	-	-	-	-	00:00:00	55	0.00
Jim Grant	159477	-	-	-	-	-	00:00:00	56	0.00
Gordon Wisniewski	716	-	-	-	-	-	00:00:00	57	0.00
Leonard Wieczorek	10105	-	-	-	-	-	00:00:00	58	0.00
Millard Wells	65503	-	-	-	-	-	00:00:00	59	0.00
Chris Sydor (SR)	280169	-	-	-	-	-	00:00:00	60	0.00
Edward Sullivan	69585	-	-	-	-	-	00:00:00	61	0.00
William Smith	12271	-	-	-	-	-	00:00:00	62	0.00
Richard Miller	179518	-	-	-	-	-	00:00:00	63	0.00
Dan Marek	2350	-	-	-	-	-	00:00:00	64	0.00
Tom Green	2689	-	-	-	-	-	00:00:00	65	0.00

1994 USIC — HAND LAUNCH STICK - #201

CONTESTANT	AMA #	1	2	3	4	5	BEST FLIGHT	PLACE	GRAND CHAMP POINTS
Richard Doig	5392	00:39:34	00:11:25	00:36:33	00:33:57	00:41:36	00:41:36	1	100.00
Jim Richmond	4936	00:41:12	-	-	-	-	00:41:12	2	99.04
Don Slusarczyk	5490	00:36:52	00:36:09	-	-	-	00:36:52	3	88.62
Stan Chilton	L-30	00:34:35	00:33:45	00:36:46	00:07:26	-	00:36:46	4	88.38
Jim Grant	159477	00:36:15	-	-	-	-	00:36:15	5	87.14
Bernard Hunt	SMAE# 56209	00:20:03	00:16:05	00:36:14	00:34:28	-	00:36:14	6	87.10
Dick Hardcastle	847	00:16:44	00:27:14	00:29:28	00:33:13	-	00:33:13	7	79.85
Larry Coslick	404651	00:32:51	-	-	-	-	00:32:51	8	78.97
Chuck Slusarczyk	2643	00:32:27	-	-	-	-	00:32:27	9	78.00
Tom Vallee	1125	00:29:36	00:32:02	-	-	-	00:32:02	10	77.00
Valdimir Linardic (SR)	MAAC# 38165-J	00:23:01	00:24:05	00:25:15	00:31:32	-	00:31:32	11	75.80
Dan Belieff	12816	00:22:26	00:21:30	00:30:08	-	-	00:30:08	12	72.44
Larry Mzik	3687	00:29:18	00:06:30	00:28:06	-	-	00:29:18	13	70.43
George Chabot	466544	00:19:48	00:26:53	00:19:29	-	-	00:26:53	14	64.62
Michael Thompson	1484	00:24:42	00:22:31	00:26:17	-	-	00:26:17	15	63.18
Vernon Hacker	44137	00:08:26	00:17:07	00:20:41	-	-	00:20:41	16	49.72
Edward Burke	153313	00:19:17	00:20:06	-	-	-	00:20:06	17	48.32
Billie Landrum	52674	-	-	-	-	-	00:00:00	18	0.00
Rob Eberle (SR)	411592	-	-	-	-	-	00:00:00	19	0.00
Larry Cailliau	79985	-	-	-	-	-	00:00:00	20	0.00

1994 USIC — PEANUT SPEED

CONTESTANT	AMA #	1	2			BEST MPH	PLACE
Chris Sydor (SR)	280169	12.84	18.38	12.84	23.38	6.67	1
Dave Robelen	12555	-	-	0.00	5.00		2
Chuck Wojtkiewicz	178300	-	-	0.00	5.00		3
Abram Van Dover	894	att	-	0.00	5.00		4
Rob Romash	130061	-	-	0.00	5.00		5

1994 USIC — ORNITHOPTER - #210

CONTESTANT	AMA #	1	2	3	4	5	BEST FLIGHT	PLACE	GRAND CHAMP POINTS
Larry Coslick	404651	06:01	11:03	-	-	-	11:03	1	100.00
Tom Nied	76537	02:22	01:59	02:27	01:32	01:13	02:27	2	22.17
Edward Ripley	484619	00:56	-	-	-	-	00:56	3	8.45

1994 USIC — PENNYPLANE - #207

CONTESTANT	AMA #	1	2	3	4	5	BEST FLIGHT	PLACE	GRAND CHAMP POINTS
Dick Hardcastle	847	15:23	16:56	15:38	16:45	-	16:56	1	100.00
Larry Coslick	404651	16:00	11:00	16:50	-	-	16:50	2	99.41
Dan O'Grady	MAAC# 6192	16:40	15:56	-	-	-	16:40	3	98.43
Phillip Hartman	8667	14:48	15:53	15:59	16:20	15:45	16:20	4	96.46
Anthony D'Alessandro	1316	14:56	15:59	-	-	-	15:59	5	94.39
Mark Vancil	124866	14:44	14:30	14:55	15:46	-	15:46	6	93.11
John Marett	MAAC# 651L	11:48	14:08	14:41	15:37	-	15:37	7	92.22
Jim Clem	L-55	12:04	14:24	15:24	13:12	-	15:24	8	90.94
John Kagan	469254	13:43	11:51	14:33	15:19	-	15:19	9	90.45
Walter Eggert	292	12:36	13:21	13:43	14:54	14:21	14:54	10	87.99
John Ganser	179424	10:49	14:13	14:48	11:30	-	14:48	11	87.40
Mike Thomas	MAAC# 1964	13:08	04:34	09:23	14:28	10:30	14:28	12	85.43
Chuck Slusarczyk	2643	14:21	10:30	-	-	-	14:21	13	84.74
Manny Radoff	28833	14:10	13:40	-	-	-	14:10	14	83.66
John Triolo	13141	14:05	13:36	01:15	-	-	14:05	15	83.17
Rob Romash	130061	13:08	13:17	-	-	-	13:17	16	78.44
Fred Rash	63458	13:07	13:06	-	-	-	13:07	17	77.46
Tom Green	2589	13:06	12:17	03:35	-	-	13:06	18	77.36
Jim Buxton	75154	13:02	-	-	-	-	13:02	19	76.97
Jim Jones	986	05:14	12:56	11:01	-	-	12:56	20	76.38
Joseph Nuszer	29036	11:11	12:45	11:34	09:24	12:45	12:45	21	75.30
Vladimir Linardic (SR)	MAAC#38165-J	10:36	12:27	10:41	-	-	12:27	22	73.52
David Raymond-Jones	MAAC# 13157	08:13	12:20	10:32	11:18	-	12:20	23	72.83
Jim Richmond	4936	12:16	-	-	-	-	12:16	24	72.44
John Fellin	95353	12:08	10:12	11:09	10:31	-	12:08	25	71.65
Bud Tenny	16718	04:29	08:55	12:06	10:55	-	12:06	26	71.46
Chris Sydor (SR)	280169	09:06	11:02	11:54	11:25	06:45	11:54	27	70.28
Howard Henderson	302944	11:48	02:46	04:52	-	-	11:48	28	69.69
Vernon Hacker	44137	11:28	02:46	11:05	04:29	-	11:28	29	67.72
Kris Forward (JR)	332265	09:50	08:52	11:08	11:17	09:53	11:17	30	66.63
Louis Leifer	MAAC# 2418L	11:14	07:49	10:24	10:08	-	11:14	31	66.34
Jim Grant	159477	07:46	10:31	02:42	-	-	10:31	32	62.11
Peter Olshefsky	MAAC# 864-L	09:24	10:19	09:17	10:12	-	10:19	33	60.93
James Zufelt	MAAC# 945	10:06	08:29	07:32	-	-	10:06	34	59.65
Billie Landrum	52674	09:53	07:22	09:54	05:11	-	09:54	35	58.46
Tony Italiano	2386	08:04	06:11	07:30	03:29	09:11	09:11	36	54.23
Edward Sullivan	69585	06:30	08:59	06:00	05:03	-	08:59	37	53.05
Jack Boone	107857	07:56	06:19	07:05	07:27	08:04	08:04	38	47.64
Chester Wrzos	20454	07:39	05:06	-	-	-	07:39	39	45.18
Dick Obarski	560	07:12	03:38	03:50	-	-	07:12	40	42.52
Abram Van Dover	894	06:26	-	-	-	-	06:26	41	37.99
Gordon Wisniewski	716	-	-	-	-	-	00:00	42	0.00
Robert Warmann	18748	-	-	-	-	-	00:00	43	0.00
Tom Vallee	1126	-	-	-	-	-	00:00	44	0.00
Michael Thompson	1484	-	-	-	-	-	00:00	45	0.00
Don Slusarczyk	5490	-	-	-	-	-	00:00	46	0.00
Larry Mzik	3687	-	-	-	-	-	00:00	47	0.00
Jack McGillivray	MAAC# 1025L	-	-	-	-	-	00:00	48	0.00
Bernard Hunt	SMAE# 56209	-	-	-	-	-	00:00	49	0.00
Ron Ganser	7532	-	-	-	-	-	00:00	50	0.00
Doug Barber	56270	-	-	-	-	-	00:00	51	0.00

1994 USIC — FAI INDOOR (F1D) - #203

CONTESTANT	AMA #	1	2	3	4	5	6	BEST FLIGHT	2ND FLIGHT	TOTAL BEST 2	PLACE	USA TEAM REGIONAL POINTS	GRAND CHAMP POINTS
Richard Doig	5392	00:40:54	00:40:59	00:42:01	00:39:57	00:39:55	-	00:42:01	00:40:59	01:23:00	1	100.00	100.00
Jim Richmond	4936	00:08:35	00:09:44	00:31:06	00:41:36	00:39:37	-	00:41:36	00:39:37	01:21:13	2	97.85	97.85
Don Slusarczyk	5490	00:34:40	00:28:03	00:27:10	00:35:21	00:35:19	-	00:35:21	00:35:19	01:10:40	3	85.14	85.14
Chuck Slusarczyk	2643	00:11:20	00:11:43	00:27:29	00:34:04	00:35:47	-	00:35:47	00:34:04	01:09:51	4	84.16	84.16
Jack McGillivray	MAAC# 1025L	00:37:34	00:29:59	-	-	-	-	00:37:34	00:29:59	01:07:33	5	-	81.39
Bill Hulbert	13143	00:24:10	00:31:58	00:32:27	00:31:33	00:33:26	-	00:33:26	00:32:27	01:05:53	6	79.38	79.38
Dan Belieff	12816	00:22:40	00:29:40	00:34:25	00:23:39	-	-	00:34:25	00:29:40	01:04:05	7	-	77.21
Mike Thomas	MAAC# 1964	00:04:16	00:31:57	00:31:40	-	-	-	00:31:57	00:31:40	01:03:37	8	-	76.65
Tom Vallee	1126	00:31:50	00:29:10	00:31:19	00:15:14	-	-	00:31:50	00:31:19	01:03:09	9	76.08	76.08
Vladimir Linardic	MAAC #38165JL	00:24:01	00:26:38	00:26:33	00:29:06	00:31:04	00:30:49	00:31:04	00:30:49	01:01:53	10	-	74.56
Larry Mzik	3687	00:26:32	00:28:29	00:28:57	-	-	-	00:28:57	00:28:29	00:57:26	11	69.20	69.20
George Chabot	466544	00:24:38	00:31:52	00:09:05	00:02:13	-	-	00:31:52	00:24:38	00:56:30	12	68.07	68.07
Rob Eberle (SR)	411592	00:20:43	00:02:09	00:24:16	00:25:46	00:26:50	-	00:26:50	00:25:46	00:52:36	13	63.37	63.37
John Kagan	469254	00:23:02	00:12:17	00:24:23	-	-	-	00:24:23	00:23:02	00:47:25	14	-	57.13
Michael Thompson	1484	00:19:48	00:12:21	00:22:31	-	-	-	00:22:31	00:19:48	00:42:19	15	-	50.98
Vernon Hacker	44137	00:08:29	00:15:42	-	-	-	-	00:15:42	00:08:29	00:24:11	16	29.14	29.14
Edward Burke	153313	00:21:53	-	-	-	-	-	00:21:53	00:00:00	00:21:53	17	-	26.37
Gary Underwood	1314	-	-	-	-	-	-	00:00:00	00:00:00	00:00:00	18	-	0.00
Dan O'Grady	MAAC# 6192	-	-	-	-	-	-	00:00:00	00:00:00	00:00:00	19	-	0.00
Dan Marek	2350	-	-	-	-	-	-	00:00:00	00:00:00	00:00:00	20	-	0.00
Bernard Hunt	SMAE# 56209	-	-	-	-	-	-	00:00:00	00:00:00	00:00:00	21	-	0.00
Dick Hardcastle	847	-	-	-	-	-	-	00:00:00	00:00:00	00:00:00	22	-	0.00
Jim Grant	159477	-	-	-	-	-		00:00:00	00:00:00	00:00:00	23	-	0.00
Walter Eggert	292	-	-	-	-	-	-	00:00:00	00:00:00	00:00:00	24	-	0.00
Stan Chilton	L-30	-	-	-	-	-	-	00:00:00	00:00:00	00:00:00	25	-	0.00
Anthony D'Alessandro	1316	-	-	-	-	-	-	00:00:00	00:00:00	00:00:00	26	-	0.00

1994 USIC — HAND LAUNCHED GLIDER - #212

CONTESTANT	AMA #	1	2	3	4	5	6	7	8	9	BEST FLIGHT	2ND FLIGHT	TOTAL (BEST 2)	PLACE	GRAND CHAMP POINTS
Jim Buxton	75154	76.5	73.6	76.0	-	-	-	-	-	-	76.5	76.0	152.5	1	100.00
Bernie Boehm	92567	66.2	67.4	69.9	74.1	74.3	73.5	74.8	72.5	72.6	74.8	74.3	149.1	2	97.77
Michael Thompson	1484	66.0	65.0	65.0	68.3	-	-	-	-	-	68.3	66.0	134.3	3	88.07
Rob Romash	130061	61.9	61.2	60.3	63.0	61.2	61.7	61.5	60.6	62.9	63.0	62.9	125.9	4	82.56
Richard Peterson	151145	27.3	43.3	20.0	32.0	40.9	38.3	59.7	20.7	59.7	59.7	59.7	119.4	5	78.30
Karl Von Bueren	51477	54.7	53.6	55.9	59.6	56.8	59.2	-	-	-	59.6	59.2	118.8	6	77.90
Chris Sydor (SR)	280169	49.0	53.0	45.0	53.1	54.3	49.8	38.9	47.2	44.3	54.3	53.1	107.4	7	70.43
Bob Eberle	411591	43.9	48.3	48.0	-	-	-	-	-	-	48.3	48.0	96.3	8	63.15
Dave Robelen	12555	39.9	38.3	29.5	14.1	17.4	37.4	35.6	32.2	34.7	39.9	38.3	78.2	9	51.28
Jim Forward	330048	20.0	22.0	27.0	19.0	23.0	35.1	35.4	36.0	33.2	36.0	35.4	71.4	10	46.82
John Kagan	469254	31.0	5.0	4.0	5.0	4.0	28.2	3.0	19.8	10.4	31.0	28.2	59.2	11	38.82
Abram Van Dover	894	21.0	21.0	17.0	25.0	10.0	18.2	-	-	-	25.0	21.0	46.0	12	30.16
Tom Sanders	244075	43.2	-	-	-	-	-	-	-	-	43.2	0.0	43.2	13	28.33
Rob Eberle (SR)	411592	-	-	-	-	-	-	-	-	-	0.0	0.0	0.0	14	0.00
Bill Schlarb	14425	-	-	-	-	-	-	-	-	-	0.0	0.0	0.0	15	0.00
Phillip Hartman	8667	-	-	-	-	-	-	-	-	-	0.0	0.0	0.0	16	0.00
John Fellin	95353	-	-	-	-	-	-	-	-	-	0.0	0.0	0.0	17	0.00
Neal Henderson	12368	-	-	-	-	-	-	-	-	-	0.0	0.0	0.0	18	0.00

1994 USIC — STANDARD CLASS CATAPULT GLIDER - #218

CONTESTANT	AMA #	1	2	3	4	5	6	7	8	9	BEST FLIGHT	2ND FLIGHT	TOTAL (BEST 2)	PLACE
Bill Schlarb	14425	80.1	76.0	73.2	59.0	77.4	80.2	-	-	-	80.2	80.1	160.3	1
Dan Belieff	12816	74.6	78.0	80.2	71.0	21.0	10.0	52.5	72.2	68.0	80.2	78.0	158.2	2
Keith Fulmer	31552	68.7	70.0	70.3	70.7	74.3	72.5	75.2	79.0	78.2	79.0	78.2	157.2	3
Ralph Schlarb	322352	73.5	76.6	77.9	75.1	71.0	77.5	-	-	-	77.9	77.5	155.4	4
Bernie Boehm	92567	62.4	68.2	72.0	75.6	71.0	74.0	75.0	73.2	3.0	75.6	75.0	150.6	5
William Passarelli	15623	64.2	61.0	69.6	70.8	72.9	71.6	75.7	74.9	-	75.7	74.9	150.6	6
Michael Thomoson	1484	73.3	76.4	-	-	-	-	-	-	-	76.4	73.3	149.7	7
Artie Jessup	10269	68.0	66.2	69.5	70.9	71.6	69.6	74.1	74.3	70.7	74.3	74.1	148.4	8
Karl Von Bueren	51477	61.4	68.0	66.3	71.7	74.0	59.4	-	-	-	74.0	71.7	145.7	9
Lee Person	383504	63.8	59.8	62.0	65.1	69.5	72.1	72.0	71.2	69.6	72.1	72.0	144.1	10
Neal Henderson	12368	15.5	63.2	73.0	5.6	67.0	70.2	14.8	68.1	53.7	73.0	70.2	143.2	11
Mark Vancil	124866	65.6	59.4	67.7	73.8	-	-	-	-	-	73.8	67.7	141.5	12
Vito Garifalo	331457	66.7	70.4	69.9	66.4	69.6	64.4	0.6	62.0	50.0	70.4	69.9	140.3	13
Rob Romash	130061	67.7	67.5	-	-	-	-	-	-	-	67.7	67.5	135.2	14
Fred Rash	63458	51.1	58.4	59.4	59.4	55.0	63.0	48.0	63.0	27.1	63.0	63.0	126.0	15
Jim Buxton	75154	63.5	61.3	61.9	-	-	-	-	-	-	63.5	61.9	125.4	16
Richard Peterson	151145	56.6	61.2	58.5	62.0	60.9	46.9	11.8	11.1	57.3	62.0	61.2	123.2	17
Jim Richmond	4936	6.2	59.4	46.6	44.1	15.1	62.3	21.6	8.2	43.3	62.3	59.4	121.7	18
Phil Klintworth	861	54.8	59.2	52.1	53.8	39.2	25.1	-	-	-	59.2	54.8	114.0	19
Robert Warmann	18748	67.6	45.5	-	-	-	-	-	-	-	67.6	45.5	113.1	20
Tony Italiano	2386	45.7	47.0	35.0	51.4	47.0	49.3	47.0	47.0	49.1	51.4	49.3	100.7	21
Bill Harding	430847	48.6	38.5	44.8	40.3	42.4	40.9	39.6	48.0	51.9	51.9	48.6	100.5	22
Mark Sistrunk	506117	46.6	44.2	36.4	41.0	48.0	42.1	50.9	49.4	47.0	50.9	49.4	100.3	23
Edward Ripley	484619	5.8	46.9	45.3	44.1	49.3	47.2	36.4	-	-	49.3	47.2	96.5	24
Ted Seaver	397871	38.4	48.0	45.1	33.0	36.0	45.4	-	-	-	48.0	45.4	93.4	25
Manny Radoff	29833	43.5	45.2	42.6	-	-	-	-	-	-	45.2	43.5	88.7	26
Donald Brimmer	1097	30.2	40.4	27.7	37.9	41.8	45.7	25.6	40.0	32.0	45.7	41.8	87.5	27
Stuart Weckerly	13250	5.3	7.0	39.0	41.1	15.1	43.0	40.6	13.3	43.7	43.7	43.0	86.7	28
Jim Kelly	37564	50.4	4.0	7.1	8.2	29.1	7.6	23.2	5.0	6.2	50.4	29.1	79.5	29
Bud Tenny	16718	34.3	36.2	35.5	15.7	10.1	-	-	-	-	36.2	35.5	71.7	30
Bob Eberle	411591	43.9	-	-	-	-	-	-	-	-	43.9	0.0	43.9	31
Tom Sanders	244075	43.4	-	-	-	-	-	-	-	-	43.4	0.0	43.4	32
Chris Sydor (SR)	280169	-	-	-	-	-	-	-	-	-	0.0	0.0	0.0	33
David Thomson	8410	-	-	-	-	-	-	-	-	-	0.0	0.0	0.0	34
Rob Eberle (SR)	411592	-	-	-	-	-	-	-	-	-	0.0	0.0	0.0	35
Gordon Wisniewski	716	-	-	-	-	-	-	-	-	-	0.0	0.0	0.0	36
John Triolo	13141	-	-	-	-	-	-	-	-	-	0.0	0.0	0.0	37
Billie Landrum	52674	-	-	-	-	-	-	-	-	-	0.0	0.0	0.0	38
William Bigge	L-127	-	-	-	-	-	-	-	-	-	0.0	0.0	0.0	39
Dan Marek	2350	-	-	-	-	-	-	-	-	-	0.0	0.0	0.0	40
Jim Grant	159477	-	-	-	-	-	-	-	-	-	0.0	0.0	0.0	41

1994 USIC — UNLIMITED SPEED

CONTESTANT	AMA #	1	2	3	4	5	6	7	BEST MPH	PLACE
Larry Coslick	404651	6.42	6.04						14.19	1
Chris Hales (JR)	One Day	12.68	9.02	9.64	12.74	9.07	7.81	7.16	11.97	2
George Chabot	466544	10.76	10.96	7.30					11.74	3
Jesse Shepherd, Sr.	4257	14.34	17.03	11.20	17.09	10.05			8.53	4
Vernon Hacker	44137	10.81							7.93	5
David Thomson	8410	-							0.00	6
Richard Doig	5392	att							0.00	7
Neal Henderson	12368								0.00	8

1994 USIC

CONTESTANT	AMA #	MINISTICK 1	2	3	4	5	BEST FLIGHT	PLACE
Bernard Hunt	SMAE# 56209	11:00	11:30	-	-	-	11:30	1
Larry Cailliau	79985	10:14	10:53	11:04	10:54	11:24	11:24	2
Dick Hardcastle	847	09:55	11:23	08:55	-	-	11:23	3
Walter Van Gorder	19912	10:27	07:40	11:18	08:54	-	11:18	4
Larry Coslick	404651	10:50	08:06	03:08	09:17	-	10:50	5
Jim Clem	L-55	09:14	09:20	10:47	-	-	10:47	6
Ted Seaver	397891	08:12	09:54	10:39	-	-	10:39	7
Rob Romash	130061	10:36	-	-	-	-	10:36	8
Michael Thompson	1484	08:22	10:18	10:34	-	-	10:34	9
Bob Eberle	411591	09:24	10:08	-	-	-	10:08	10
John Kagan	489254	10:06	03:37	08:31	07:15	-	10:06	11
Jack McGillivray	MAAC# 1025L	07:07	09:01	10:04	-	-	10:04	12
Anthony D'Alessandro	1316	10:02	-	-	-	-	10:02	13
Doug Deller	MAAC #15800	08:58	09:49	05:17	-	-	09:49	14
Dick Obarski	560	09:48	06:26	03:59	-	-	09:48	15
Mark Vancil	124866	08:46	07:01	09:25	-	-	09:25	16
William Pavek	319915	06:03	09:23	-	-	-	09:23	17
Howard Henderson	302944	08:51	09:18	-	-	-	09:18	18
John Fellin	95353	08:32	09:13	08:37	08:58	-	09:13	19
W.L.Martin	41300	09:10	09:05	06:53	08:36	-	09:10	20
Jack Archibald	192711	08:00	08:26	08:57	-	-	08:57	21
Larry Mzik	3687	08:30	08:42	-	-	-	08:42	22
Vladimir Linardic	MAAC# 38165-J	08:40	08:02	-	-	-	08:40	23
Robert Warmann	18748	08:39	-	-	-	-	08:39	24
Karl Von Bueren	51477	07:26	06:35	05:06	08:31	-	08:31	25
Bill Harding	430847	07:00	08:23	08:20	-	-	08:23	26
Tom Vallee	1126	08:06	-	-	-	-	08:06	27
Stuart Weckerly	13250	07:49	05:33	-	-	-	07:49	28
John Barker	2095	06:44	06:51	06:48	06:49	07:47	07:47	29
John Vancil	338494	06:48	07:44	07:40	-	-	07:44	30
John Ganser	179424	07:28	-	-	-	-	07:28	31
John Diebolt	97263	06:58	07:26	05:28	04:05	-	07:26	32
David Raymond-Jones	MAAC# 13157	03:45	05:57	05:58	06:26	02:30	06:26	33
George Chabot	466544	05:58	-	-	-	-	05:58	34
Edward Ripley	484619	04:21	02:25	05:28	04:18	-	05:28	35
Vernon Hacker	44137	03:58	03:01	04:40	-	-	04:40	36
Mark Sistrunk	506117	04:37	-	-	-	-	04:37	37
Dave Henshaw	MAAC #226L	04:15	04:06	04:02	03:50	03:22	04:15	38
Bud Tenny	16718	03:57	-	-	-	-	03:57	39
Jim Jones	986	-	-	-	-	-	00:00	40
Phillip Alvirez	228391	-	-	-	-	-	00:00	41
William Bigge	L-127	-	-	-	-	-	00:00	42
Dan Belieff	12816	-	-	-	-	-	00:00	43
Leonard Wieczorek	10105	-	-	-	-	-	00:00	44
Robert Wells	512604	-	-	-	-	-	00:00	45
John Triolo	13141	-	-	-	-	-	00:00	46
David Thomson	8410	-	-	-	-	-	00:00	47
Edward Sullivan	69585	-	-	-	-	-	00:00	48

1994 USIC

MINISTICK

CONTESTANT	AMA #	1	2	3	4	5	BEST FLIGHT	PLACE
William Smith	12271	-	-	-	-	-	00:00	49
Dave Robelen	12555	-	-	-	-	-	00:00	50
Richard Peterson	151145	-	-	-	-	-	00:00	51
Richard Miller	179518	-	-	-	-	-	00:00	52
Billie Landrum	52674	-	-	-	-	-	00:00	53
Jim Grant	159477	-	-	-	-	-	00:00	54
Walter Eggert	292	-	-	-	-	-	00:00	55
Stan Chilton	L-30	-	-	-	-	-	00:00	56
John Triolo	13141	-	-	-	-	-	00:00	57
Mark Sistrunk	506117	-	-	-	-	-	00:00	58
Jon Vancil	338494	-	-	-	-	-	00:00	59
Larry Mzik	3687	-	-	-	-	-	00:00	60
W.L. Martin	41300	-	-	-	-	-	00:00	61

1994 USIC

INTERMEDIATE STICK - #202

CONTESTANT	AMA #	1	2	3	4	5	BEST FLIGHT	PLACE	GRAND CHAMP POINTS
Bernard Hunt	SMAE# 56208	00:32:59	00:34:10	00:37:22	-	-	00:37:22	1	100.00
Jack McGillivray	MAAC# 1025L	00:17:34	00:32:32	00:35:07	-	-	00:35:07	2	93.98
Dick Hardcastle	847	00:29:23	00:33:06	00:33:14	-	-	00:33:14	3	88.94
Stan Chilton	L-30	00:32:59	00:31:47	00:32:31	-	-	00:32:59	4	88.27
Jim Richmond	4936	00:01:49	00:01:18	00:23:04	00:32:01	00:31:11	00:32:01	5	85.68
Larry Coslick	404651	00:27:30	00:30:52	00:29:44	00:25:33	-	00:30:52	6	82.60
Chuck Slusarczyk	2643	00:09:35	00:27:42	00:29:40	-	-	00:29:40	7	79.39
Walter Eggert	292	00:27:53	-	-	-	-	00:27:53	8	74.62
Dan Belieff	12816	00:21:32	00:26:23	00:11:00	00:27:50	-	00:27:50	9	74.49
Mike Thomas	MAAC #1964	00:22:52	00:27:38	00:24:38	-	-	00:27:38	10	73.95
Dan O'Grady	MAAC# 6192	00:25:41	00:13:19	-	-	-	00:25:41	11	68.73
John Barker	2095	00:08:57	00:15:42	00:20:23	00:20:55	00:25:16	00:25:16	12	67.62
Jim Grant	159477	00:25:14	00:24:06	00:07:27	-	-	00:25:14	13	67.53
Ron Ganser	7532	00:19:31	00:23:15	00:24:25	00:22:48	-	00:24:25	14	65.34
Michael Thomoson	1484	00:24:11	00:24:13	-	-	-	00:24:13	15	64.81
Dick Obarski	560	00:21:24	00:13:34	00:23:37	00:10:26	00:22:27	00:23:37	16	63.20
John Marett	MAAC# 651L	00:10:13	00:21:19	00:08:28	-	-	00:21:19	17	57.05
Vladimir Linardic	MAAC #38165-J	00:16:14	00:19:27	00:17:12	00:18:25	00:02:46	00:19:27	18	52.05
Vernon Hacker	44137	00:05:09	00:04:33	00:04:28	00:12:35	00:19:24	00:19:24	19	51.92
Joseph Nuszer	29036	00:17:55	00:17:54	-	-	-	00:17:55	20	47.95
Larry Mzik	3687	00:16:26	00:16:03	-	-	-	00:16:26	21	43.98
Chris Sydor (SR)	280169	00:11:35	00:13:35	-	-	-	00:13:35	22	36.35
Phillip Hartman	8667	00:10:14	-	-	-	-	00:10:14	23	27.39
Don Slusarczyk	5490	00:08:05	-	-	-	-	00:08:05	24	21.63
Tom Vallee	1126	00:04:14	-	-	-	-	00:04:14	25	11.33
Chester Wrzos	20454	-	-	-	-	-	00:00:00	26	0.00
David Raymond-Jones	MAAC #13157	-	-	-	-	-	00:00:00	27	0.00
Dan Marek	2350	-	-	-	-	-	00:00:00	28	0.00
Billie Landrum	52674	-	-	-	-	-	00:00:00	29	0.00
Rob Eberle (SR)	411592	-	-	-	-	-	00:00:00	30	0.00
Anthony D'Alessandro	1316	-	-	-	-	-	00:00:00	31	0.00
Edward Burke	153313	-	-	-	-	-	00:00:00	32	0.00
Jim Buxton	75154	-	-	-	-	-	00:00:00	33	0.00

1994 USIC

LIMITED PENNYPLANE - #208

CONTESTANT	AMA #	1	2	3	4	5	BEST FLIGHT	PLACE	GRAND CHAMP POINTS
Bernard Hunt	SMAE# 56209	13:50	14:20	15:04	-		15:04	1	100.00
Chuck Slusarczyk	2643	12:34	13:03	13:20	14:41	-	14:41	2	97.46
Walter Eggert	292	14:33	10:58	12:53	-		14:33	3	96.57
Tom Green	2589	02:08	14:23	14:11	14:25	-	14:25	4	95.69
Michael Thompson	1484	13:26	14:22	-			14:22	5	95.35
Larry Coslick	404651	12:21	06:35	13:09	12:41	13:53	13:53	6	92.15
Dick Hardcastle	847	13:31	13:12	13:33	10:43	13:50	13:50	7	91.81
Fred Rash	53458	11:57	12:46	13:38	-		13:38	8	90.49
Ted Seaver	397891	11:42	11:47	13:33	04:11	12:23	13:33	9	89.93
Jim Grant	159477	13:22	13:13	11:20	11:57	12:24	13:22	10	88.72
Ron Ganser	7532	03:48	11:56	13:22	-		13:22	11	88.72
Dan O'Grady	MAAC# 6192	12:30	13:06	12:22	11:10	-	13:06	12	86.95
Anthony D'Alessandro	1316	13:05	10:25	-			13:05	13	86.84
Jim Clem	L-55	12:50	12:23	13:00	-		13:00	14	86.28
Tom Vallee	1125	02:55	12:59	03:15	12:50	-	12:59	15	86.17
Richard Miller	179518	12:58	03:07	-			12:58	16	86.06
Robert Warmann	18748	11:37	12:29	12:40	11:49	12:53	12:53	17	85.51
Jim Buxton	75154	11:41	12:53	11:34	11:48	-	12:53	18	85.51
Jim Richmond	4936	02:30	05:46	12:47	12:28	-	12:47	19	84.85
Paul Avery	158011	12:31	12:42	08:45	09:55	-	12:42	20	84.29
Mike Thomas	MAAC# 1964	11:39	08:45	12:42	08:23	03:04	12:42	21	84.29
Walter Van Gorder	19912	06:40	11:56	08:40	08:42	12:40	12:40	22	84.07
John Ganser	179424	11:15	12:36	12:32	-		12:36	23	83.63
Joseph Nuszer	29036	08:20	12:34	11:52	10:24	-	12:34	24	83.41
Tom Nied	76537	10:52	12:18	03:27	12:30	-	12:30	25	82.96
Larry Mzik	3687	09:43	12:29	04:39			12:29	26	82.85
Don Slusarczyk	5490	11:17	11:50	11:18	12:25	-	12:25	27	82.41
Rob Romash	130061	11:19	11:31	12:20	-		12:20	28	81.86
John Triolo	13141	09:46	11:57	11:04	12:15	-	12:15	29	81.31
Stuart Weckerly	13250	03:52	11:38	09:06	11:48	12:07	12:07	30	80.42
Chris Sydor (SR)	280169	09:40	10:59	12:01	06:41	11:38	12:01	31	79.76
John Barker	2095	06:08	09:03	12:01	09:31	08:19	12:01	32	79.76
James Zufelt	MAAC# 945	11:19	11:50	06:18	-	07:03	11:50	33	78.54
John Marett	MAAC# 651L	11:29	10:36	04:27	11:48	03:57	11:48	34	78.32
Karl Von Bueren	51477	10:34	10:16	10:16	11:34	11:44	11:44	35	77.88
William Pavek	319915	09:03	10:55	11:43	10:13	-	11:43	36	77.77
Dick Obarski	560	08:06	11:43	10:22	02:43	-	11:43	37	77.77
Bud Tenny	16718	07:29	10:42	11:19	-		11:19	38	75.11
Manny Radoff	28833	11:18	08:23	09:39	08:24	-	11:18	39	75.00
Vladimir Linardic (SR)	MAAC#38165-J	07:56	10:20	04:07	10:21	11:09	11:09	40	74.00
John Kagan	469254	11:03	09:36	05:46	08:02	-	11:03	41	73.34
Howard Henderson	302944	03:20	09:20	08:31	11:00	-	11:00	42	73.01
Phillip Hartman	8667	08:19	10:57	07:17	-		10:57	43	72.68
Vernon Hacker	44137	10:53	10:06	09:56	-		10:53	44	72.23
David Raymond-Jones	MAAC# 13157	09:04	09:21	08:00	06:41	10:53	10:53	45	72.23
Leonard Wieczorek	10105	10:47	07:38	-			10:47	46	71.57
Doug Deller	MAAC# 15800	05:28	08:09	09:20	10:14	10:46	10:46	47	71.46
Peter Olshefsky	MAAC# 864-L	08:22	08:20	10:11	10:40	05:44	10:40	48	70.80

1994 USIC — LIMITED PENNYPLANE - #208

CONTESTANT	AMA #	1	2	3	4	5	BEST FLIGHT	PLACE	GRAND CHAMP POINTS
Mark Vancil	124866	09:56	10:30	10:34	-		10:34	49	70.13
W.L. Martin	41300	05:31	09:31	09:29	10:23	-	10:23	50	68.92
Jack Archibald	192711	09:56	10:19	-			10:19	51	68.47
Jack Boone	107857	09:37	09:53	09:01	09:28	09:58	09:58	52	66.15
Jim Forward	330088	07:43	08:34	08:15	09:54	09:49	09:54	53	65.71
John Fellin	95353	09:00	06:04	09:49	09:00	07:14	09:49	54	65.15
John Diebolt	97263	06:46	08:17	09:06	05:14	-	09:06	55	60.40
Doug Barber	56270	08:42	-				08:42	56	57.74
Tony Italiano	2386	04:15	08:05	07:14	04:54	03:57	08:05	57	53.65
John Blair	29698	07:47	07:31	-	-	-	07:47	58	51.66
Chester Wrzos	20454	05:51	05:28	07:23	04:17	-	07:23	59	49.00
Edward Sullivan	69585	06:52	04:20	-			06:52	60	45.58
Dave Henshaw	MAAC #226L	03:00	05:22	06:10	06:16	06:11	06:16	61	41.59
Herbert Stevens	13086	05:20	05:46	-			05:46	62	38.27
Jack McGillivray	MAAC# 1025L	dnf					00:00	63	0.00
Gordon Wisniewski	716	dnf					00:00	64	0.00
Richard Peterson	151145	dnf					00:00	65	0.00
Billie Langrum	52674	dnf					00:00	66	0.00
Jim Jones	986	dnf					00:00	67	0.00
Harry Geyer	17708	dnf					00:00	68	0.00
William Bigge	L-127	dnf					00:00	69	0.00

1994 USIC — MANHATTAN CABIN - #205

CONTESTANT	AMA #	1	2	3	4	5	BEST FLIGHT	PLACE	GRAND CHAMP POINTS
Mike Thomas	MAAC# 1964	10:54	11:48	12:31	-	-	12:31	1	100.00
John Marett	MAAC# 651L	09:03	11:16	08:00	12:23	-	12:23	2	98.93
Walter Van Gorder	19912	10:26	11:47	12:18	-	-	12:18	3	98.27
Jim Grant	159477	04:40	11:30	11:46	-	-	11:46	4	94.01
Larry Coslick	404651	11:33	11:10	11:28	11:05	-	11:33	5	92.28
Anthony D'Alessandro	1316	07:50	10:12	11:10	-	-	11:10	6	89.21
Chuck Slusarczyk	2643	07:20	08:16	09:59	10:54	-	10:54	7	87.08
Stuart Weckerly	13250	08:31	09:38	10:36	10:05	-	10:36	8	84.69
Ron Ganser	7532	10:35	07:10	02:46	-	-	10:35	9	84.55
Paul Avery	158011	08:47	09:49	09:44	08:14	09:37	09:49	10	78.43
John Diebolt	97263	02:26	05:07	05:40	07:08	06:46	07:08	11	56.99
Abram Van Dover	894	02:04	02:27	04:03	03:46	03:17	04:03	12	32.36
James Zufelt	MAAC# 945	02:55	-	-	-	-	02:55	13	23.30
John Triolo	13141	-	-	-	-	-	00:00	14	0.00
Richard Peterson	151145	-	-	-	-	-	00:00	15	0.00
Bernard Hunt	SMAE# 56209	-	-	-	-	-	00:00	16	0.00
Tom Green	2689	-	-	-	-	-	00:00	17	0.00

1994 USIC — R.O.G. CABIN - #204

CONTESTANT	AMA #	1	2	3	4	5	BEST FLIGHT	PLACE	GRAND CHAMP POINTS
Dan Belieff	12816	07:38	22:27	-	-	-	22:27	1	100.00
Ron Ganser	7532	14:21	22:05	12:44	21:39	-	22:05	2	98.37
Anthony D'Alessandro	1316	09:49	13:38	18:42	-	-	18:42	3	83.30
Mike Thomas	MAAC 1964	16:01	-	-	-	-	16:01	4	71.34
John Marett	MAAC 651L	10:52	10:11	15:22	-	-	15:22	5	68.45
Don Slusarczyk	5490	-	-	-	-	-	00:00	6	0.00

1994 USIC — BOSTONIAN - #215

CONTESTANT	AMA #	1	2	3	4	5	BEST FLIGHT	2ND FLIGHT	TOTAL BEST 2	CHARISMA	TOTAL	PLACE
Jim Grant	159477	01:24	03:15	05:03	05:31	04:58	05:31	05:03	10:34	1.14	722.76	1
Larry Coslick	404651	04:27	04:56	04:48	01:52	05:32	05:32	04:56	10:28	1.15	722.20	2
Mike Thomas	MAAC #1964	05:11	05:16	05:09	04:15	05:17	05:17	05:16	10:33	1.11	702.63	3
Tom Sanders	244075	04:35	04:50	05:02	-	-	05:02	04:50	09:52	1.09	645.28	4
Richard Miller	179518	04:27	00:42	05:06	03:34	-	05:06	04:27	09:33	1.09	624.57	5
Paul Avery	158011	03:46	04:16	04:00	04:12	-	04:16	04:12	08:28	1.20	609.60	6
Joseph Nuszer	29036	04:03	01:31	04:06	-	-	04:06	04:03	08:09	1.15	562.35	7
William Pavek	319915	04:14	03:36	03:35	03:17	04:12	04:14	04:12	08:26	1.10	556.60	8
John Marett	MAAC# 651L	04:20	04:22	02:55	03:15	-	04:22	04:20	08:42	1.04	542.88	9
Richard Peterson	151145	03:38	03:09	03:58	-	-	03:58	03:38	07:36	1.12	510.72	10
Michael Thompson	1484	03:16	03:32	03:42	03:37	-	03:42	03:37	07:19	1.16	509.24	11
John Barker	2095	03:40	03:16	02:48	04:02	03:20	04:02	03:40	07:42	1.08	498.96	12
Ron Ganser	7532	04:05	03:35	-	-	-	04:05	03:35	07:40	1.05	483.00	13
Tom Nied	76537	02:21	02:27	02:40	03:07	03:31	03:31	03:07	06:38	1.20	477.60	14
Dave Robelen	12555	03:22	03:48	03:33	02:59	02:05	03:48	03:33	07:21	1.08	476.28	15
John Triolo	13141	02:09	03:15	03:57	-	-	03:57	03:15	07:12	1.07	462.24	16
Herbert Stevens	13086	03:00	03:17	02:03	02:22	03:02	03:17	03:02	06:19	1.03	390.37	17
Bill Martin	41300	02:53	02:57	02:28	02:14	-	02:57	02:53	05:50	1.07	374.50	18
Karl Von Bueren	51477	02:32	02:05	02:30	-	-	02:32	02:30	05:02	1.12	338.24	19
Ted Seaver	397891	02:35	02:41	-	-	-	02:41	02:35	05:16	1.04	328.64	20
Jim Buxton	75154	02:32	02:41	02:35	-	-	02:41	02:35	05:16	1.04	328.64	21
Doug Deller	MAAC #15800	02:01	00:47	02:17	-	-	02:17	02:01	04:18	1.03	265.74	22
Millard Wells	65503	02:03	01:59	-	-	-	02:03	01:59	04:02	1.05	254.10	23
Jim Richmond	4936	03:30	-	-	-	-	03:30	00:00	03:30	1.14	239.40	24
John Blair	29698	02:58	-	-	-	-	02:58	00:00	02:58	1.10	195.80	25
John Kagan	469254	02:25	-	-	-	-	02:25	00:00	02:25	1.10	159.50	26
Leonard Wieczorek	10105	00:59	-	-	-	-	00:59	00:00	00:59	1.14	67.26	27
Don Slusrczyk	5490	-	-	-	-	-	00:00	00:00	00:00	1.20	0.00	28
Abram Van Dover	894	-	-	-	-	-	00:00	00:00	00:00	1.13	0.00	29
Anthony D'Alessandro	1316	-	-	-	-	-	00:00	00:00	00:00	1.13	0.00	30
Vito Garofalo	331457	-	-	-	-	-	00:00	00:00	00:00	1.12	0.00	31
William Passarelli	15623	-	-	-	-	-	00:00	00:00	00:00	1.10	0.00	32
David Thomson	8410	-	-	-	-	-	00:00	00:00	00:00		0.00	33
Ken Lazarus	371820	-	-	-	-	-	00:00	00:00	00:00		0.00	34
Robert Warmann	18748	-	-	-	-	-	00:00	00:00	00:00		0.00	35
Edward Sullivan	69585	-	-	-	-	-	00:00	00:00	00:00		0.00	36
Phillip Hartman	8667											37

1994 USIC — PISTACHIO SCALE

CONTESTANT	AMA #	SUBJECT	1	2	3	4	5	6	7	8	9	TOTAL (Best 2)	FLIGHT POINTS	STATIC POINTS	TOTAL	PLACE
Donald Brimmer	1097	Citabria	57.7	47.9	35.6	52.8	57.7	60.6	31.0	-	-		3	1	4	1
Dr. John Martin	712	Goldwing	87.0	111.2	-	-	-	-	-	-	-	198.2	2	6	8	2
Millard Wells	65503	Curtiss Jenny	31.6	32.5	-	-	-	-	-	-	-	64.1	6	4	10	3
Millard Wells	65503	Andreason	42.0	59.0	-	-	-	-	-	-	-	101.0	5	6	11	-
Dr. John Martin	712	Messerschmitt M-206	54.0	61.0	-	-	-	-	-	-	-	115.0	4	7	11	-
Jack McGillivray	MAAC# 1025L	Hosler Fury	123.0	120.0	-	-	-	-	-	-	-	243.0	1	10	11	4
Robert Wells	512604	P-51 Mustang	12.0	10.0	-	-	-	-	-	-	-	22.0	10	2	12	5
Chuck Wojtkiewicz	178300	Microplano Veloz	15.0	9.0	-	-	-	-	-	-	-	24.0	9	3	12	6
Millard Wells	65503	Waco E	27.0	-	-	-	-	-	-	-	-	27.0	8	5	13	-
Millard Wells	65503	Huntington H-12	56.1	-	-	-	-	-	-	-	-	56.1	7	8	15	-
Millard Wells	65503	MO-1	-	-	-	-	-	-	-	-	-	-	-	6	6	-
John Blair	29698	Hergt Monoplane	-	-	-	-	-	-	-	-	-	-	-	9	9	-
Mason Plank	268274													-	0	-

1994 USIC — NO-CAL SCALE

CONTESTANT	AMA #	1	2	3	4	5	BEST FLIGHT	PLACE
Mike Thomas	MAAC #1964	06:38	07:17	07:47	-	-	07:47	1
Robert Warmann	18748	05:49	05:32	07:25	-	-	07:25	2
Howard Henderson	302944	06:10	06:52	-	-	-	06:52	3
Larry Coslick	404651	05:37	05:43	06:34	04:59	06:14	06:34	4
Chuck Slusarczyk	2643	06:22	06:15	05:54	06:15	-	06:22	5
Daniel Baird	334655	03:22	05:23	03:19	05:48	05:05	05:48	6
Dave Robelen	12555	05:23	00:51	05:45	05:18	05:35	05:45	7
Dick Obarski	560	04:28	05:40	05:23	05:44	05:06	05:44	8
William Pavek	319915	03:46	04:49	05:42	-	-	05:42	9
John Ganser	179424	05:18	03:37	05:15	05:37	04:27	05:37	10
Jim Buxton	75154	05:31	05:03	-	-	-	05:31	11
John Marett	MAAC# 651L	04:14	03:09	00:49	05:05	-	05:05	12
Louis Leifer	MAAC# 2418L	01:28	04:53	05:01	-	-	05:01	13
Tom Nied	76537	05:00	04:31	03:42	03:00	04:51	05:00	14
Rob Romash	130061	03:21	04:19	-	-	-	04:19	15
Walter Eggert	292	03:47	03:50	-	-	-	03:50	16
Larry Mzik	3687	03:48	01:51	-	-	-	03:48	17
Fred Rash	63458	02:46	03:09	02:49	03:15	03:05	03:15	18
Abram Van Dover	894	02:55	03:03	02:49	-	-	03:03	19
Jon Vancil	339494	02:34	02:28	02:17	-	-	02:34	20
Edward Ripley	484619	02:18	-	-	-	-	02:18	21
Karl Von Bueren	51477	02:09	02:15	-	-	-	02:15	22
Richard Peterson	151145	00:58	01:24	01:24	-	-	01:24	23
Mark Vancil	124866	-	-	-	-	-	00:00	24
Ted Seaver	397891	-	-	-	-	-	00:00	25
Joseph Nuszer	29036	-	-	-	-	-	00:00	26
Bernard Hunt	SMAE# 56209	-	-	-	-	-	00:00	27
Bill Harding	430847	-	-	-	-	-	00:00	28
Vernon Hacker	44137	-	-	-	-	-	00:00	29

1994 USIC — COCONUT SCALE

CONTESTANT	AMA #	SUBJECT	1	2	3	BEST FLIGHT	FLIGHT RANKING	STATIC RANKING	TOTAL RANKING	PLACE
Dave Rees	33928	Citabria	125	128	-	128	4	1	5	1
Walter Eggert	292	Air Coach	158	166	-	166	1	5	6	2
Millard Wells	65503	Ford 2-AT	58	-	-	58	8	2	10	3
Tim Lavender	applied 6/3/94	Aristocrat	117	157	150	157	3	10	13	4
Dr. John Martin	712	Goldwing	74	77	-	77	7	7	14	5
Stuart Weckerly	13250	Found	109	-	-	109	6	11	17	6
Walter Schlesinger	5954	Hi-max	37	35	38	38	9	12	21	7
Donald Brimmer	1097	PT-19	-	-	-	0		4	4	-
Jack McGillivray	MAAC# 1025L	Keith Curtiss	-	-	-	0		6	6	-
Dave Rees	33928	Travel Air 6000	102	127	-	127	5	3	8	-
Dave Rees	33928	Zippy	160	164	-	164	2	8	10	-
?	?	Alexander	-	-	-	0		9	9	-
Don Slusarczyk	5490									

1994 USIC

CONTESTANT	SCALE POINTS	TOTAL POINTS	PLACE	GRAND CHAMP POINTS
Don Slusarczyk	112.50	225.00	1	100.00
Jack McGillivray	112.50	225.00	2	100.00
Ron Ganser	112.50	207.50	3	92.22
Michael Thompson	94.50	189.00	4	84.00
Stuart Weckerly	123.50	188.50	5	83.78
Walter Eggert	82.00	155.05	6	68.91
Jim Miller	103.50	152.50	7	67.78
Richard Peterson	76.00	151.00	8	67.11
Millard Wells	94.50	146.20	9	64.98
Jim Pollard	90.00	131.25	10	58.33
Dick Hardcastle	48.75	97.50	11	43.33
Robert Wells	63.00	91.55	12	40.69
Herbert Stevens	52.50	0.00	13	0.00
Robert Wells	58.13	0.00	14	0.00
William Passarelli			15	0.00
Dr. John Martin			16	0.00

1994 USIC — FEDERATION R.O.G

CONTESTANT	AMA #	1	2	3	4	5	BEST FLIGHT	PLACE
Jim Clem	L-55	08:55	01:31	-			08:55	1
Daniel Baird	334655	07:50	05:48	05:45	06:56	03:42	07:50	2
Larry Coslick	404651	06:21	06:20	06:13	07:07	06:53	07:07	3
Fred Rash	63458	06:09	03:40	03:45	-		06:09	4
Howard Henderson	302944	04:43	02:20	06:04	05:09	05:08	06:04	5
Neal Henderson	12368	05:35	03:47	04:34	-		05:35	6
Edward Ripley	484619	01:41	03:41	05:00	04:49	05:07	05:07	7
Ted Seaver	397871	03:41	04:30	03:03	04:28	-	04:30	8
John Fellin	95353	02:41	-				02:41	9
TEAM F.R.O.G.								
TENN-Baird Rash							13:59	1
MISSOURI-Coslick Henderson							13:11	2
TEXAS- Clem							08:55	3
WISCONSIN-Seaver Fellin							07:11	4

1994 USIC — PEANUT SCALE - #505

CONTESTANT	AMA #	SUBJECT	1	2	3	4	5	6	7	8	9	BEST FLIGHT	BEST MAX	2ND FLIGHT	2ND MAX	AVERAGE BEST 2
Don Slusarczyk	5490	1911 Voisin	129.2	117.8	-	-	-	-	-	-	-	129.2	112.5	117.8	112.5	112.5
Jack McGillivray	MAAC# 1025L	Issac's Fury	112.5	90.0	134.0	-	-	-	-	-	-	134.0	112.5	112.5	112.5	112.5
Ron Ganser	7532	1911 Voisin	60.0	59.0	10.0	42.0	88.0	94.0	96.0	86.0	-	96.0	96.0	94.0	94.0	95.0
Michael Thompson	1484	1935 Farman F-450	116.4	122.1	-	-	-	-	-	-	-	122.1	94.5	116.4	94.5	94.5
Stuart Weckerly	13250	Float Plane	24.0	63.0	62.0	67.0	-	-	-	-	-	67.0	67.0	63.0	63.0	65.0
Walter Eggert	292	Focker D III	74.8	71.3	-	-	-	-	-	-	-	74.8	74.8	71.3	71.3	73.1
Jim Miller	89382	Santos Dumont 14bis	49.0	49.0	-	-	-	-	-	-	-	49.0	49.0	49.0	49.0	49.0
Richard Peterson	151145	Let Zlin	79.0	49.0	74.0	-	-	-	-	-	-	79.0	76.0	74.0	74.0	75.0
Millard Wells	65503	P-40	50.5	52.9	-	-	-	-	-	-	-	52.9	52.9	50.5	50.5	51.7
Jim Pollard	345975	Waterman Gosling	34.8	37.0	33.2	45.5	-	-	-	-	-	45.5	45.5	37.0	37.0	41.3
Dick Hardcastle	847	Mo I	58.0	95.0	126.0	-	-	-	-	-	-	126.0	48.8	95.0	48.8	48.8
Robert Wells	512604	Andreasson	57.1	-	-	-	-	-	-	-	-	57.1	57.1	0.0	0.0	28.6
Herbert Stevens	13086	Cougar	-	-	-	-	-	-	-	-	-	0.0	0.0	0.0	0.0	0.0
Robert Wells	512604	Ford AT											0.0		0.0	0.0
William Passarelli	15623															
Dr. John Martin	712															

1994 USIC — KIT PLAN SCALE - #213

CONTESTANT	AMA #	SUBJECT	1	2	3	4	5	BEST FLIGHT	BEST (MAX)	2ND FLIGHT	2ND (MAX)	FIDELITY POINTS	CRAFT POINTS	TOTAL BEST 2 FLIGHTS	TOTAL POINTS	PLACE
Richard Miller	179519	Howard DGA-9	104.0	109.0	-	-	-	109.0	95.0	104.0	95.0	59.0	36.0	190.0	285.0	1
John Blair	29699	Fairchild Ranger	101.0	90.0	-	-	-	101.0	91.0	90.0	90.0	55.0	36.0	181.0	272.0	2
Dr. John Martin	712	Dornier Komet	74.0	97.0	86.0	-	-	97.0	86.0	86.0	86.0	56.0	30.0	172.0	258.0	3
Walter Eggert	292	Puss Moth	113.0	111.0	-	-	-	113.0	85.0	111.0	85.0	53.0	32.0	170.0	255.0	4
Dave Rees	33928	Zippy Sport	141.0	127.0	-	-	-	141.0	78.0	127.0	78.0	46.0	32.0	156.0	234.0	5
Ken Lazarus	371820	Curtiss Robin	28.0	45.0	46.0	-	-	46.0	46.0	45.0	45.0	51.0	24.0	91.0	166.0	6
Jim Grant	159477	YO-57 Taylorcraft	18.0	-	-	-	-	18.0	18.0	0.0	0.0	54.0	36.0	18.0	108.0	7
Herbert Stevens	13086	Curtiss Falcon	-	-	-	-	-	0.0	0.0	0.0	0.0	20.0	36.0	0.0	0.0	8
Oliver Benton	46662	Sperry Monoplane	-	-	-	-	-	0.0	0.0	0.0	0.0	52.0	28.0	0.0	0.0	9
Paul Avery	158011															10
Robert Wells	512604															11
Jack Boone	107857															12
David Thomson	8410															13
Edward Sullivan	69585															14

1994 USIC — HI-WING MONOPLANE

CONTESTANT	AMA #	SUBJECT	1	2	3	BEST FLIGHT	FLIGHT POINTS	STATIC POINTS	TOTAL POINTS	PLACE
Donald Brimmer	1097	Cessna C-37	57	67	78	78	69.00	49.50	119	5
Dr. John Martin	712	Dornier Komet	89	-	-	89	74.50	51.00	126	3
Jack McGillivray	MAAC# 1025L									-
Jim Miller	89382	Lacey						50.00	50	-
Jim Miller	89382	Hi-max	93	102	120	120	82.50	52.25	135	1
Jim Pollard	345975	Cessna Airmaster	23	51	56	56	56.00	45.00	101	6
Walter Schlesinger	5954	Leopard Moth						46.00	46	-
Michael Thompson	1484	Lacey	142	152	146	152	82.50	49.25	132	2
Stuart Weckerly	13250	Ford AT	106	107		107	79.25	42.50	122	4
Robert Wells	512604	Aeronca	40	-	-	40	40.00	43.25	83	10
Robert Wells	512604	Ford AT	38	-	-	38	38.00	47.00	85	9
John Blair	29698	Stinson Reliant	46	-	-	46	46.00	46.00	92	7
Millard Wells	65503	Douglas OBS VID-43	42	49	-	49	49.00	43.00	92	8
Bill Harding	430847									-

1994 USIC — AMA SCALE - #507

CONTESTANT	AMA #	SUBJECT	1	2	3	4	BEST FLIGHT		2ND FLIGHT	AVERAGE BEST 2	SCALE POINTS		TOTAL POINTS	PLACE
Ed Stoll	1243	Corbin S Ace	68	85	91	97	90	91	90	90.0	93.0	183.0	183.0	1
Ron Ganser	7532	Cessna	82	88	90	96	90	90	90	90.0	92.3	182.3	182.3	2
Jack McGillivray	MAAC# 1025L	SE5	87	110	100	-	90	100	90	90.0	92.2	182.2	182.2	3
John Blair	29698	Church mid wing	58	85	87	-	87	85	85	86.0	93.6	179.6	179.6	4
William Passarelli	15623	Nesmith cougar	99	108	-	-	90	99	90	90.0	76.0	166.0	166.0	5
Stuart Weckerly	13250	Found centennial	66	100	100	-	90	100	90	90.0	73.0	163.0	163.0	6
Dave Rees	33928	Travel air	110	98	-	-	90	98	90	90.0	72.0	162.0	162.0	7
Jim Miller	89382	Lacey M10	93	77	64	24	90	77	77	83.5	76.0	159.5	159.5	8
Doc John Martin	712	Dornier Komet	72	97	100	-	90	97	90	90.0	65.0	155.0	155.0	9
Jim Pollard	345975	Martin M I	54	62	64	51	64	62	62	63.0	69.0	132.0	132.0	10
Joe Nuszer	29036	Fairchild trainer	-	-	-	-	0	0	0	0.0	70.0	70.0	0.0	11
Millard Wells	65503										61.0	61.0	0.0	12
Robert Wells	512604	Waco cabin									55.0	55.0	0.0	13

1994 USIC CONTESTANT	201 FL STICK	202 INT STICK	203 F1D	204 ROG CABIN	205 MANH CABIN	206 FZB	207 99	208 L-99	210 ORNI	212 HLG	215 BOSTON	505 PAUT SCALE	507 AMA SCALE	TOTAL CHAMP POINTS
Larry Coslick		82.60			92.28	100.00	99.41	92.15	100.00		99.92			666.36
Anthony D'Alessandro		0.00		83.30	89.21	72.33	94.39	86.84			0.00			426.07
Walter Eggert		74.62	0.00			82.09	87.99	96.57				68.91		410.18
Ron Ganser		55.34		98.37	84.55			88.72			66.63	92.22	99.62	595.65
Dick Hardcastle	79.85	88.94	0.00			73.04	100.00	91.81				43.33		476.97
Bernard Hunt	37.10	100.00	0.00		0.00	93.92	0.00	100.00						331.02
John Kagan			57.13			75.95	92.45	73.34		38.82	22.07			357.76
John Marett		57.05		58.45	98.93	79.25	92.22	78.32			75.11			549.34
Jack McGillivray		93.98	81.39			86.17	0.00	0.00				100.00	99.56	461.10
Mike Thomas		73.95		71.34	100.00	95.86	85.43	84.29			97.21			508.10
Michael Thompson	63.18	64.81				82.42	0.00	95.35		88.07	70.46			464.29
Tom Vallee	77.00	11.33	76.08			70.85	0.00	86.17						321.44
Vladimir Linardic (SR)						76.28	73.52	74.00						223.81
Don Slusarczyk	83.62	21.62	85.14			95.93	0.00	82.41				100.00		473.74
Chuck Slusarczyk	78.00	79.39	84.16		87.08	29.61	84.74	97.46						540.45

1994 USIC	FAC SCALE									
CONTESTANT	AMA #	SUBJECT	1	2	3	BEST FLIGHT	FLIGHT POINTS	STATIC POINTS	TOTAL POINTS	FLYOFF	PLACE
Jack McGillivray	MAAC# 1025L	SE-5 Replica	117	-	-	117	81.75	76.75	158.50		1
Stuart Weckerly	13250	Centennial 100/Floats	77	73	100	100	77.50	65.00	142.50		2
William Passarelli	15623	Nesmith Cougar	122	-	-	122	82.50	55.00	137.50	144	3
Dave Rees	33928	Citabria	115	121	-	121	82.50	55.00	137.50	129	4
Jim Miller	89382	Martin MO-1	86	53	104	104	78.50	58.25	136.75		5
Richard Miller	179518	Volksplane	37	62	92	92	75.50	58.25	133.75		6
John Blair	29698	C-165 Airmaster	99	76	116	116	81.50	48.25	129.75		7
Dr. John Martin	712	Howard Ike	76	74	66	76	68.00	57.00	125.00		8
Oliver Benton	46662	Volksplane	57	68	60	68	64.00	60.50	124.50		9
Jim Miller	89382	Voison	33			33	33.00	79.00	112.00		10
Chuck Wojtkiewicz	178300	Albatross DIII	31	-	-	31	31.00	65.50	96.50		11
Jim Pollard	345975	Sopwith Tabloid	13	-	-	13	13.00	64.25	77.25		12
Walter Schlesinger	5954	Fokker DVII	10	12	-	12	12.00	63.50	75.50		13
Robert Wells	512604	Ford AT	-	-	-	0	0.00	49.00	0.00		14
Robert Wells	512604	Martin MO-1	-	-	-	0	0.00	45.50	0.00		15
Randolph Lane	448191	Gee Bee Model D	-	-	-	0	0.00	21.25	0.00		16
Jim Buxton	75154		-	-	-	0	0.00		0.00		17
Michael Thompson	1484		-	-	-	0	0.00		0.00		18

1994 USIC	GOLDEN AGE SCALE							
CONTESTANT	AMA #	SUBJECT	1	2	3	FLIGHT TOTAL	FLYOFF	PLACE
Stuart Weckerly	13250	Stout 2AT	120	120	120	360	155	1
Jack McGillivray	MAAC# 1025L	Cessna C-38	120	120	120	360	153	2
Michael Thompson	1484	Farman	120	120	120	360	144	3
John Blair	29698	Taylor Cub	78	83	93	254		4
Donald Brimmer	1097		77	67	61	205		5
Walter Schlesinger	5954	DH Leopard Moth	38	38	42	118		6
Jim Miller	89382	Martin MO-1	111	-	-	111		7
Jim Pollard	345975	Monocoupe 90L	52	31	-	83		8
Chuck Wojtkiewicz	178300	Taylorcraft	46	-	-	46		9
Chuck Wojtkiewicz	178300	Brewster Buffalo	23	-	-	23		10
Plenny Bates	29541							11
Walter Eggert	292	Cessna C-34						12
Dr. John Martin	712							13
Dave Rees	33928							14
Oliver Benton	46662							15

1995 U.S.I.C

DAY 1

7:30	10:30	12:00	1:00	3:15	5:30
HEAVY OVER 1.5 GRAM	LIGHT UNDER 1.5 GRAM	P-24 MASS LAUNCH	HEAVY	LIGHT	
PRACTICE			PRACTICE		

WE HAVE PRINTED A FLYING SCHEDULE FOR THE 1995 CONTEST IN THIS ISSUE. WHAT DO YOU THINK?

DAY 2

7:30	11:00	1:00	2:00	5:00	11:00
H.L. GLIDER CATAPULT GLIDER	INTERMEDIATE STICK HELICOPTER ORNITHOPER	NO FLY	INTERMEDIATE STICK HELICOPTER ORNITHOPTER	FID CABIN 35.CM	

DAY 3

7:30	11:30	1:00	1:45	5:45	10:00
AMA SCALE FAC SCALE UNLIMITED SPEED NO. CAL. KIT/PLAN FROG	PENNYPLANE MANHATTAN	NO FLY	PENNYPLANE MAMHATTAN	FID PRO 20	

DAY 4

7:30	11:30	1:30	2:15	5:15	6:30	?
COCONUT SCALE BOSTONIAN PEA SCALE GRAND PRIX SCALE FAC H WING FAC GOLDEN AGE	LIMITED P.P. COCONUT SCALE MASS LAUNCH 11:30	NO FLY	LIMITED P.P.		BANQUET	

DAY 5

7:30	11:30	1:30	2:15	5:30
MINI STK AUTOGIRO	EZB MINI STK MASS LAUNCH 11:30	NO FLY	EZB	

P-24 CONDOR CONTEST RULES

1. THE MODEL MUST BE BUILT ACCORDING TO PLAN. NO DEVIATIONS WILL BE ALLOWED.

2. A 7 INCH PLASTIC PROP WITH PLASTIC THRUST BEARING MUST BE USED WITH NO ALTERATIONS. CLAY MAY BE ADDED TO THE LIGHT SIDE FOR BALANCE.

3. THE PROP SHAFT MAY BE GLUED TO THE PROP TO ELIMINATE EXTRA PLAY.

4. MINIMUM WEIGHT FOR THE MODEL IS 12 GRAMS.

5. JAPANESE TISSUE MUST BE USED FOR COVERING THE MODEL.

6. TIP DIHEDRAL MUST BE 1 3/4 INCHES.

7. THE WING SADDLE MUST BE BUILT ACCORDING TO PLAN.

8. THE MODELS MUST BE HAND-LAUNCHED.

9. THE DISTANCE BETWEEN THE FRONT OF THE THRUST BEARING AND THE REAR MOTOR HOOK MUST BE 17 INCHES.

10. THE SAME MOTOR MUST BE USED THROUGHOUT THE COMPETITION. IF THE MOTOR BREAKS, IT CAN BE RETIED.

11. THE LAST TEN PLANES TO LAND FROM THE MASS LAUNCH WILL HAVE A FLY-OFF. THE LAST FIVE OF THESE PLANES WILL HAVE A FLYOFF. FINALLY, THE LAST TWO WILL HAVE A FLYOFF FOR A WINNER.

12. THERE ARE NO RESTRICTIONS ON RUBBER SIZE.

13. ALL MODELS WILL BE PROCESSED.

IF YOU NEED A P-24 CONDOR, KITS MAY BE ORDERED FOR $9.99, PLUS $2.00 POSTAGE FROM:

MACE MODEL AICRAFT COMPANY
359 S. 119 EAST AVENUE
TULSA, OK 74128

"PRO-20"

MONOPLANE.

MAXIMUM PROJECTED WING SPAN 20 INCHES.

MAXIMUM PROJECTED WING AREA 68 SQUARE INCHES.

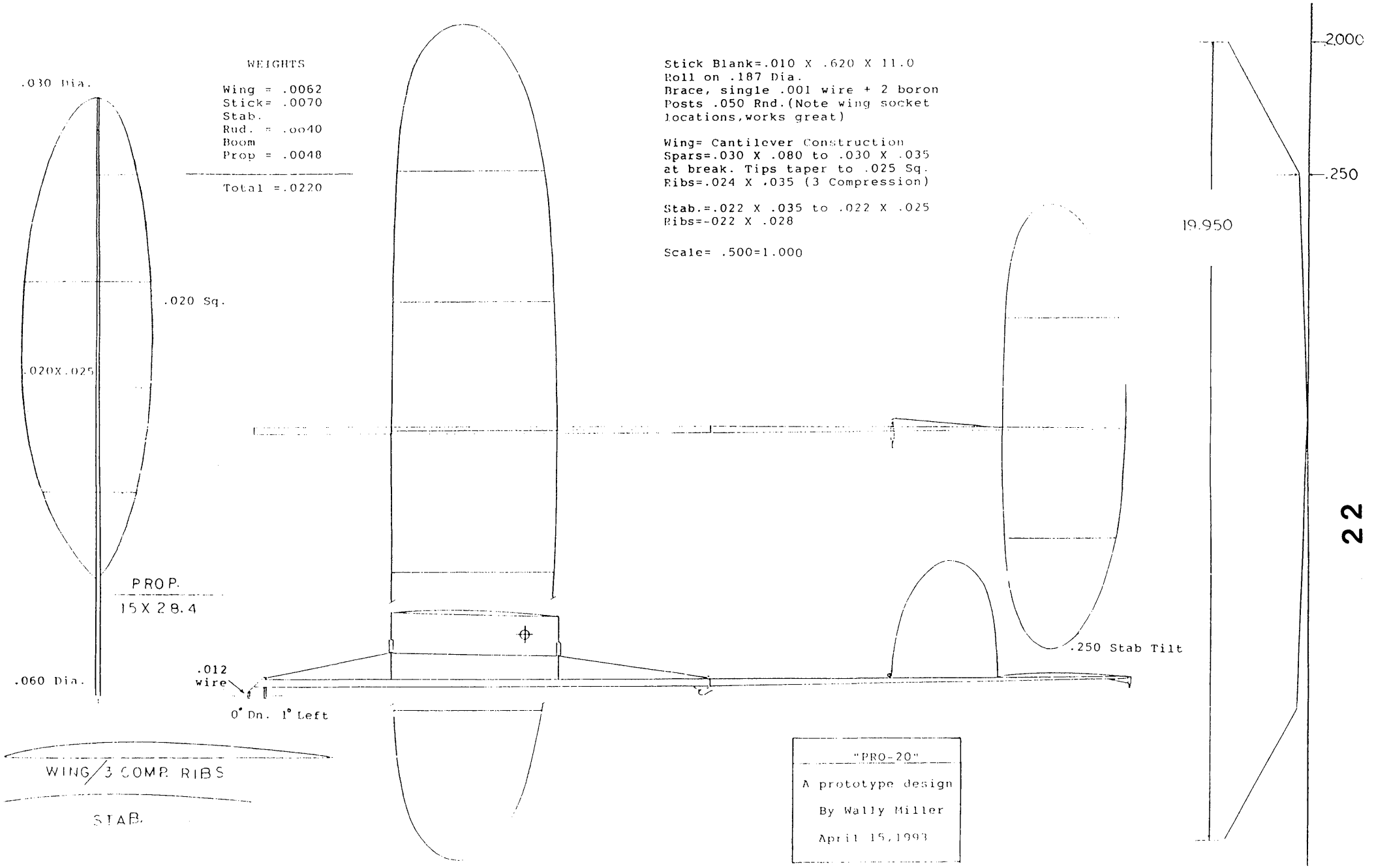
MAXIMUM STABILIZER AREA 50% OF WING AREA.

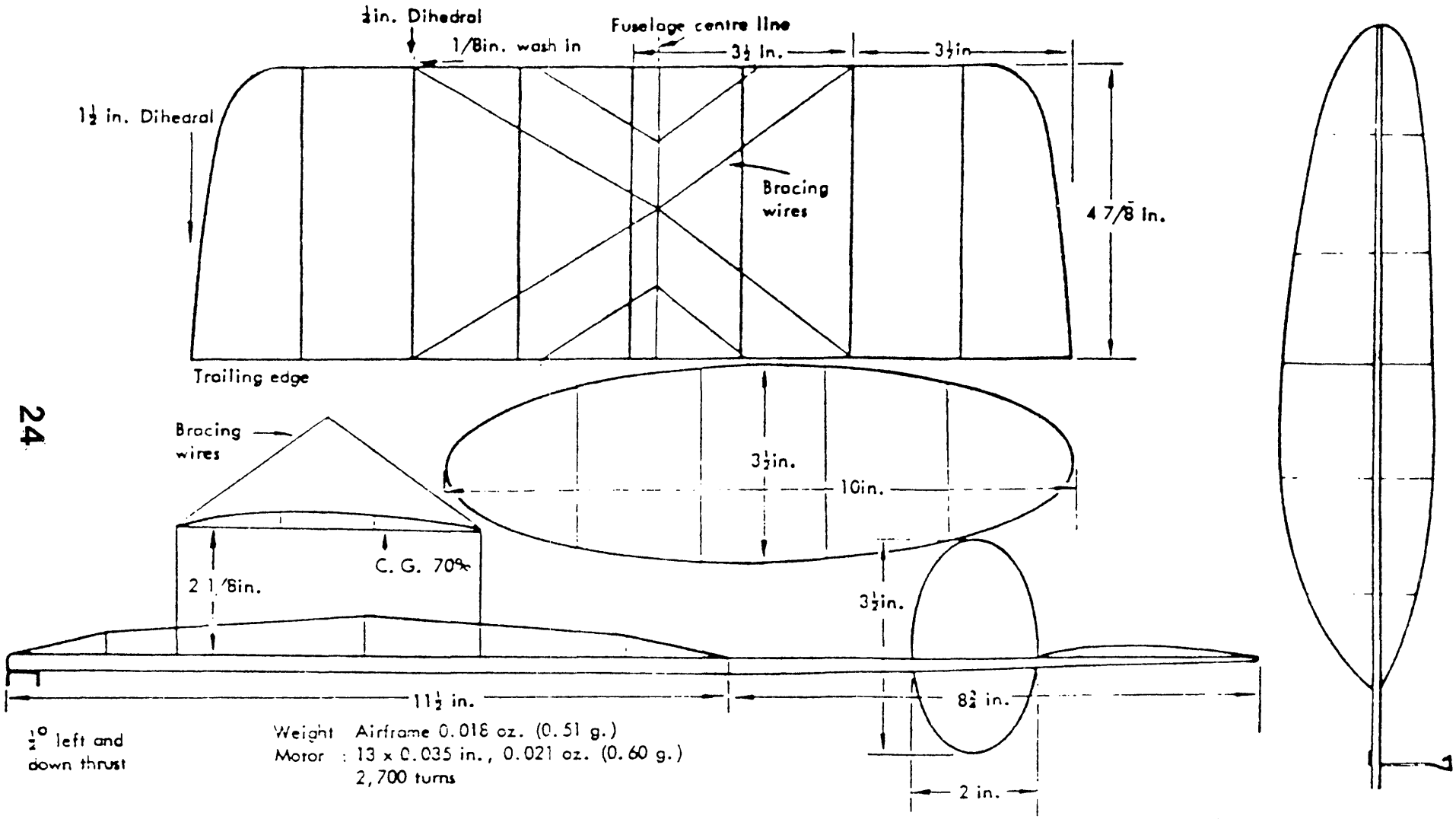
PROPELLER: MUST BE BUILT UP, MICROFILM OR PLASTIC COVERED. NO VARIABLE PITCH OR VARIABLE DIAMETER MECHANISMS PERMITTED. PROPELLER HUBS WHICH PERMIT BLADE REPLACEMENT AND MANUAL ADJUSTMENT OF PITCH ARE ACCEPTABLE.

MOTOR STICK: MUST BE BUILT UP (NO SOLID MOTOR STICKS)

ENERGY RESTRAINING DEVISES OTHER THAN THE PROPELLER ARE PROHIBITED.

IN ADDITION TO THE ABOVE, RULES FOR FREE FLIGHT INDOOR RUBBER AND STICK MODEL SHALL APPLY.


.030 Dia.
WEIGHTS
Wing = .0062
Stick= .0070
Stab.
Rud. = .0040
Boom
Prop = .0048
Total =.0220
Stick Blank=.010 X .620 X 11.0
Roll on .187 Dia.
Brace, single .001 wire + 2 boron
Posts .050 Rnd.(Note wing socket
locations,works great)
Wing= Cantilever Construction
Spars=.030 X .080 to .030 X .035
at break. Tips taper to .025 Sq.
Ribs=.024 X .035 (3 Compression)
Stab.=.022 X .035 to .022 X .025
Ribs=-022 X .028
Scale= .500=1.000
2.000
.250
19.950
.020 Sq.
.020X.025
PROP.
15X28.4
.250 Stab Tilt
.060 Dia.
.012
wire
0° Dn. 1° Left
WING/3 COMP. RIBS
STAB.
"PRO-20"
A prototype design
By Wally Miller
April 15,1993
22



½° left and down thrust

Weight Airframe 0.018 oz. (0.51 g.)
Motor : 13 x 0.035 in., 0.021 oz. (0.60 g.)
2,700 turns

LAURIE BARR'S 35cm MICROFILM MODEL

Model drawn quarter full size, propeller half full-size

INDOOR NEWS & VIEWS PHOTO PAGES

(CONTINUED)

UNITED STATES INDOOR CHAMPIONSHIPS 1994

22 Mike Thomas of Etobicoke Ont., Canada and winning NO-CAL Hosler Fury, a 1930's racer. It has a rolled motor tube and wing struts but the motor runs outside the struts. Mike also took first in Manhattan.

23 GEE BEE racer NO-CAL by Dick Peterson of Southern California. Plan was from the Blacksheep Squadron.

24 Flying Aces Stick from (what else) Flying Models of early 1993 fitted with I.R. control. All of this the product of the mind and hand of Phil Smith. And it does work. This model a little fast for a small gym but there is no doubt the working of the control system. See notes on photo 18 for Phil's address.

25 This is a complete airborne side of the control system for indoor I.R./C. It is just a little longer than a AA pen cell.

26 Frog by Jim Clem took first, something of a habit for him. Note set up for a partial motor as Bob Randolph says "It is the 'Royal Road'to successful ----- Indoor model flying" This one has boron on rolled tube and a wire braced motor tube.

27 Indoor slope soaring by Rob Roman. This is no joke Rob could keep it up as long as he kept walking. Control was good.

28 LASA 60 by Lockheed - Aeromachia. The turbine powered model was picked by Dave Robelen. Dave who is a Brainbuster uses the extended fowler flap to give undercamber for a more efficient airfoil at model speeds. Model entered in FAC scale at USIC but has also placed in AMA outdoor contests as a P-30. Dave also got second in P-Nut Speed.

29 USIC 1994 GRAND CHAMPION and editor of INAV Larry Coslick. Shown here with his flapper which placed first.

30 Howard Henderson INAV treasurer and generator of mailing labels for INAV.

31 Roy White handles correspondence for INAV with Mary Reilley managing editor of INAV.

32 Walt Eggers took fourth in Kit-Plan-Scale using a Puss Moth. Shown here with his Limited Penny Plane.

33 Citabria Coconut Scale by Rees. Double covered as is his Zippy Sport. Dave says it is a good flyer.

34 Don Slusarczyk with his winner of the Coconut Scale mass launch event. Chuck Slusarczyk was more excited than Don. Don also took first in P-Nut and Chuck a fourth in F 1 D.

35 The winners of the FROG event. L to R. Dan Baird - second, Howard Henderson - fifth, Larry Coslick - third, Jim Clem - first, and Fred Rash - fourth.

36 Bud Tenny the fellow who got INAV started and the current indoor editor of Model Aviation, AMA indoor contest board etc. We all owe him.

37 Cessna C 37 by Donald Brimmer entered in FAC high wing monoplane. A very nice job.

38 The Great Earl Stahl is not catching flies but rather is looking at the Coconut mass launch event.

39 Cessna C 38 entered in FAC Golden Age Scale by Jack McGilvery of Toronto. It has his usual high level of workmanship. Jack was third in the very tight AMA Scale race.

40 Tim (son) Lavender launching his Embryo. Both Lavenders are very active FAC flyers.

41 Dan Belief winner of Catapult Glider event.

42 Jim Buxton winner of Hand Haunch Glider.

43 Left to right, Erv Rodemsky indoor world champ West Baden Springs, 1980 and the maker of the film solution "used by champions." Cliff Culpepper Jr. and Alien Culpepper.

44 Pistachios by the Lavenders - Waterman Racer by Tim (father) and Jodel by Tim (son) Lavender. They both do nice work.

45 Messerschmitt Transport in Pistachio by Tim (father) Lavender.

46 Church Midwing AMA and FAC scale by John Blair. This one really has the detail such as spoked wheels, magneto with spark plug wires, three part spark plugs, other engine detail and all bracing and control wires. This was another of the models that were for all practical purposes in a four way tie for first place. John was fourth.

47 Coconut General Aristocrat by Tim Lavender. Never got very high and was only about six or seven seconds short of winning the mass launch, five or six seconds behind second. As usual, Tim did a very nice job.

nFFS

NATIONAL FREE FLIGHT SOCIETY

INDOOR NEWS & VIEWS PHOTO PAGES

UNITED STATES INDOOR CHAMPIONSHIPS 1994

1 Melody Doig and the very new Doig. He looks like a good one. Melody again did the computer tabulation of results at the USIC. Richard Doig took first in F 1 D.

2 The Don Lindley Trophy for first place in Bostonian. Designed by Vito M. Garofalo and presented as a perpetual trophy by the Chicago Aeronuts. Don was a moving force behind Bostonian and Kit-Plan-Scale. Jane Lindley presented trophy to Jim Grant this years Bostonian winner.

3 The likeness of Don Lindley looks from the window of Tom Nied's Lindley designed Bean Machine, a simple easy to build Bostonian, which appeared in the April 1992 INAV. Tom built the prop from a blank supplied by Don. All built for flying at the College of DuPage have done well for their builders.

4 Tri surfaced Bostonian "Three If By Air" by William Passarelli of Long Island NY. It is covered with condenser paper. The fuselage applied then shrunk and one light coat of dope. Bill took fifth in AMA Scale.

5 Paul Avery's Bostonian sports tinted windows and a Richard Miller prop design.

6 Abram Van Dover calls his David Aronstein designed Boston Celtic "B-ARF" but it looks good. Those Brainbusters have a sense of humor. Abram took fourth in P-Nut Speed.

7 Zippy Sport Coconut by Dave Rees took second by only one or two seconds in the mass launch event. This is not a minimum model as it has double covered flying surfaces and the complex "Bird Cage" cockpit of the full scale subject.

8 Marie and Dave Rees with 36" FAC scale Citabria. They run HiLine, P.O. Box 11558, Goldsboro NC 27532. The latest products are two ducted fan units. Catalog is $ 1.00.

9 Peanut HI-MAX by Jim Miller of Fayetteville Ohio. George Benson who did a construction article for Model Builder on this plane helped with detail information. Mace, the builder of the full scale ship also supplied information. Jim was eighth in AMA Scale.

10 Jim Grant and his Manhattan. Jim won the Lindley / Aeronuts award for first in Bostonian this year. Jim was also forth in Manhattan and seventh in Kit-Plan-Scale.

11 Walt Van Gorder's Manhattan Pieces. Walt has been a consistent winner in this class and gave indoor a nice boost when M.A. published "Pieces" a few years ago. Walt was third (12:18) Mike Thomas first (12.31) and John Marett third (12:23).

12 John Blair looks at his models resting on the plans from whence they came. At right Chuck Schultz of Schultz Plan Service, 910 Broadfields DR, Louisville KY 40407. Catalog is SASE and $ 1.00. The plans are first rate.

13 Corben Super Ace by Ed Stoll. Look at that engine detail which is covered in flight. This model took first place in AMA scale. Four of the models in scale were so close to perfection they were separated by only fractions of a point.

14 Ed Stoll of Mt Clemens Mich. and Corben of photo # 13. Ed has been a member of the Balsa Bugs since the conception 52 years ago. They ran the USIC this year. Everyone owes them thanks.

15 First place winner Pistachio a Citrabra by Don Brimmer of the M.I.A.M.I. club. Time was one minute.

16 Second place Pistachio Goldwing ultralight by Dr John Martin of the M.I.A.M.I. club. The best time was 1 min 51 sec.

17 Third place Pistachio Curtiss Jenny by Millard Wells of the M.I.A.M.I. club. This model is full of detail. The usual high quality workmanship by Millard.

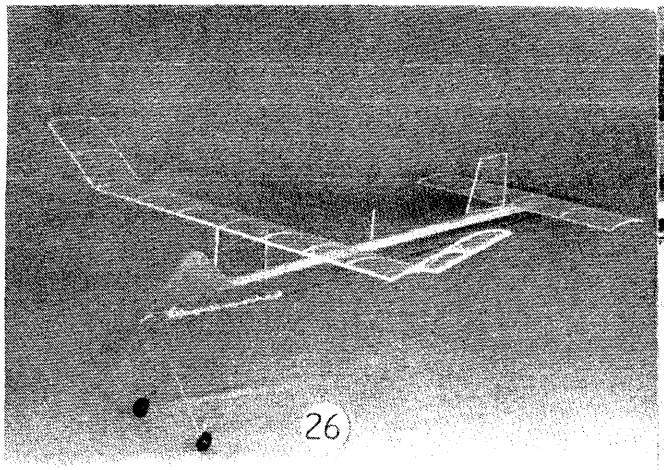
18 The well equipped I.R./C flyer heading for the local gym. That is not a misprint, this indoor electric is controlled by an infrared beam. Designer and builder was Phil Smith, 2662 Sharon Drive, Adrian Michigan 49221 (517) 263-4572. Smith Engineering specializes in printed circuits, special labels and custom electronic assemblies. See photos # 24 and # 25 for more detail.

19 Stu Weckerly of Dearborn Mich. and his Found Centennial FAC AMA scale. The big one that was on floats two years ago is now on wheels. Stu was second in FAC Scale and first in Golden Age FAC Scale.

20 Ron Ganser's 1911 Cessna 26" AMA scale. Ron used a Gene Thomas plan and scale data. Landing gear is scale with functional springs wound from .008" music wire. Balsa wheels and tires with aluminum hubs each have 72 spokes of polyester thread. The engine is built up - each spark plug is of three parts plus the high tension lead. This model was second by 0.7 of a point out of 183 points. Ron was also third in P-Nut Scale.

21 Richard Miller won Kit-Plan-Scale with this 25" Howard DGA-9 from a Comet 25 cent kit plan.

EXCLUSIVE INDOOR NEWS AND VIEWS PHOTO COVERAGE 1994 USIC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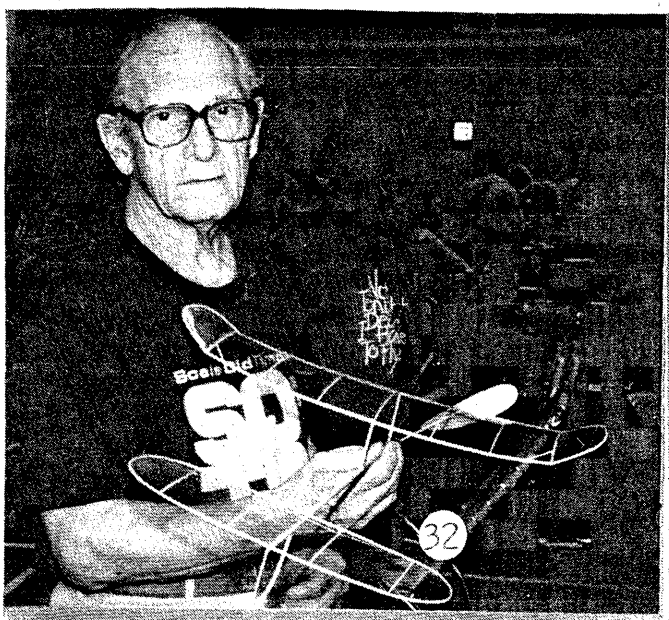

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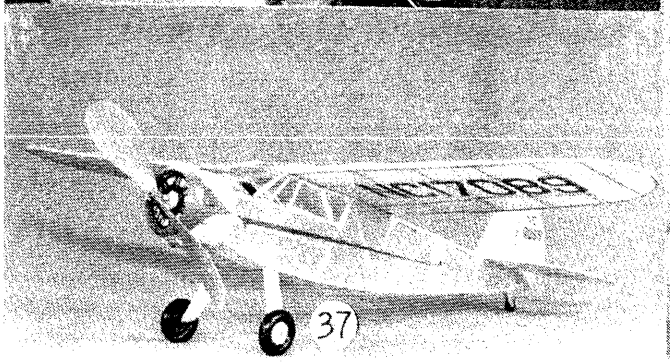
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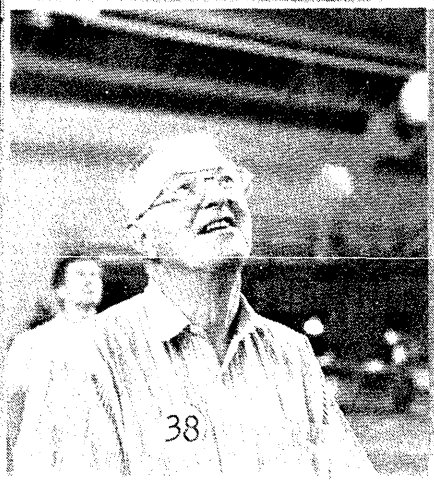
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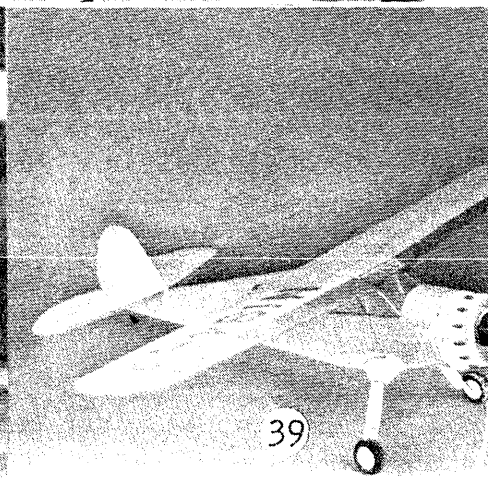
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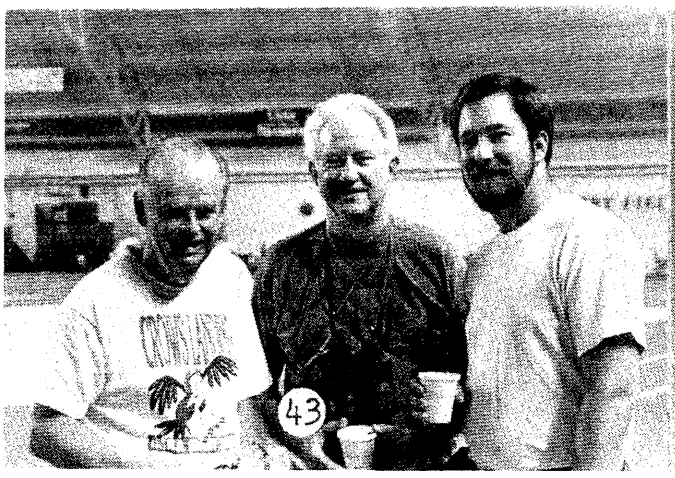
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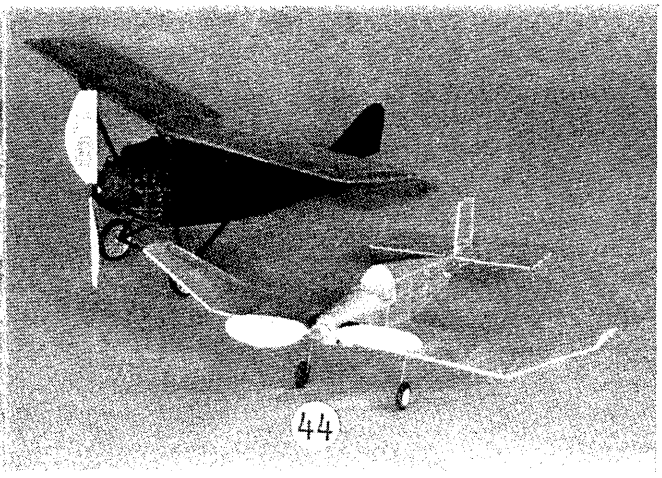
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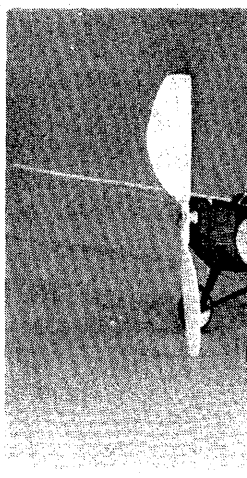


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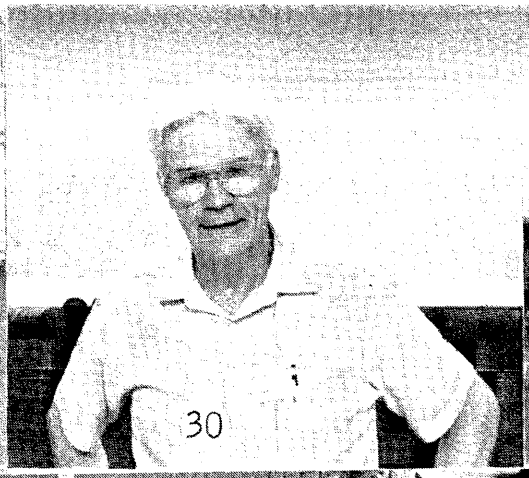
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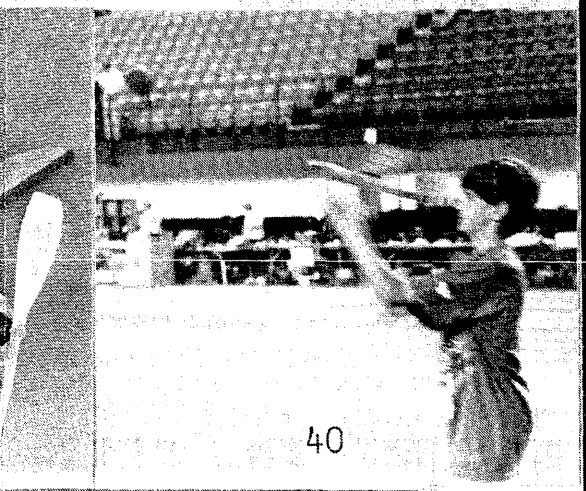
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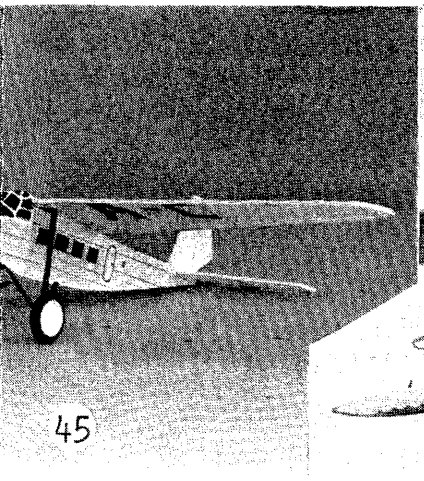
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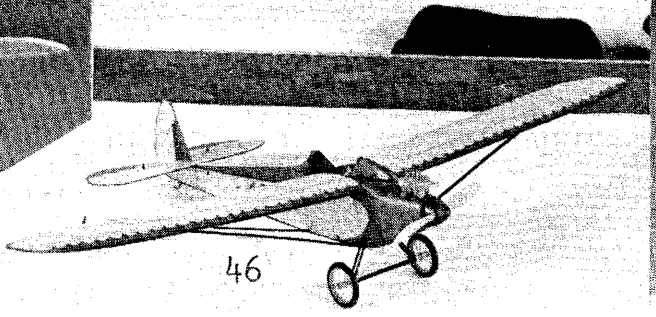
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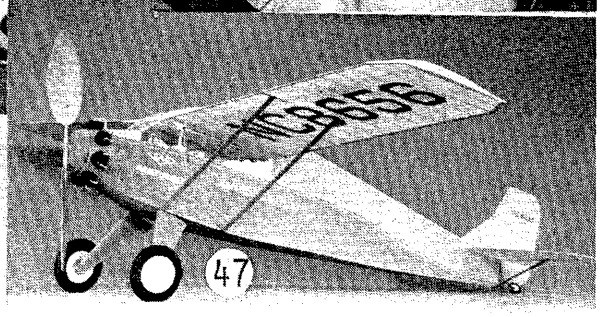
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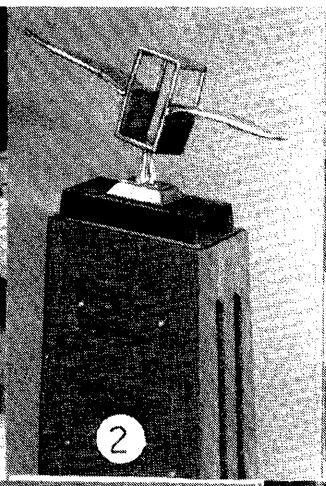
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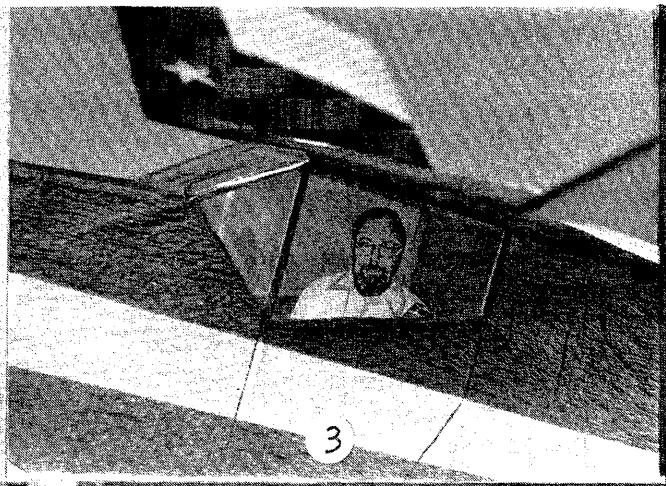
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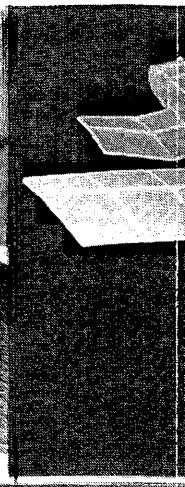

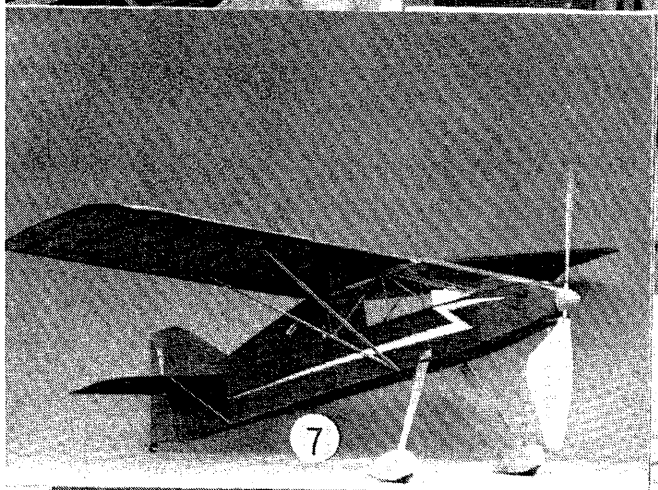
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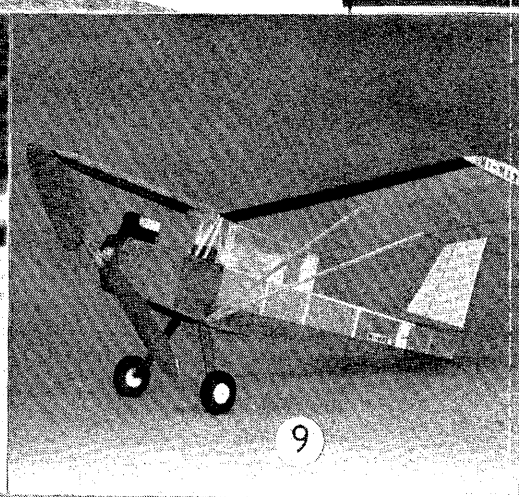
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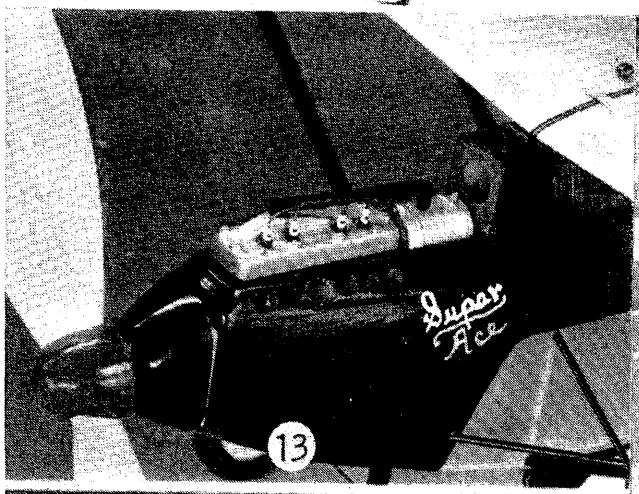

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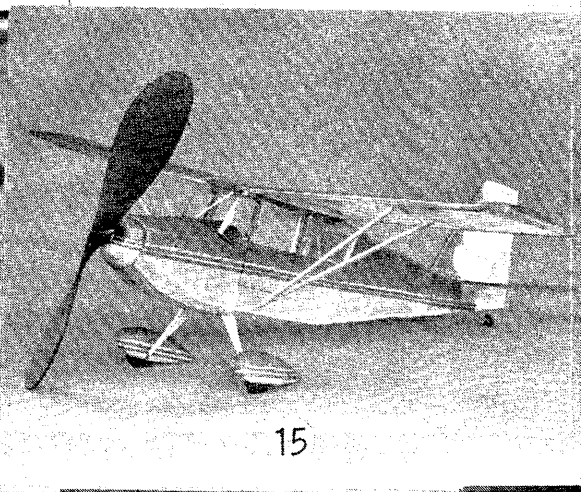
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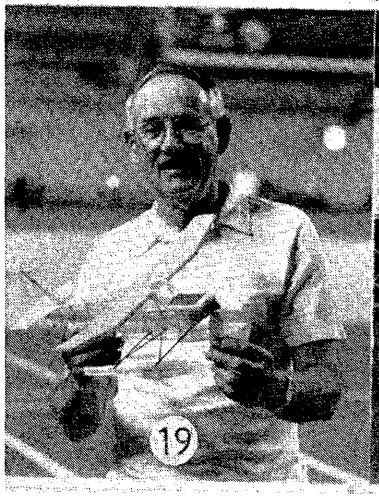
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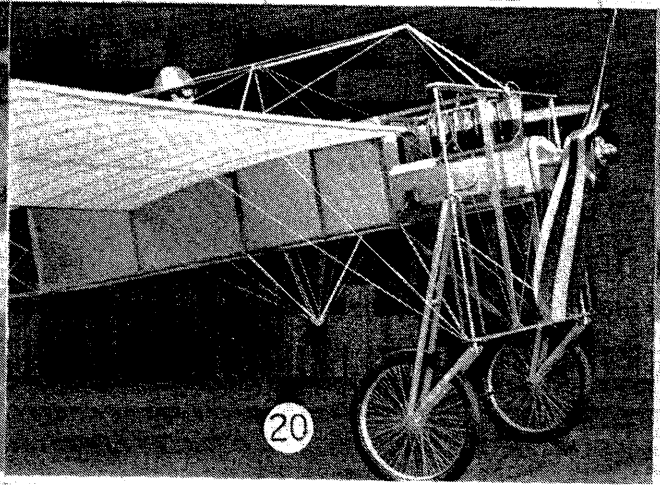
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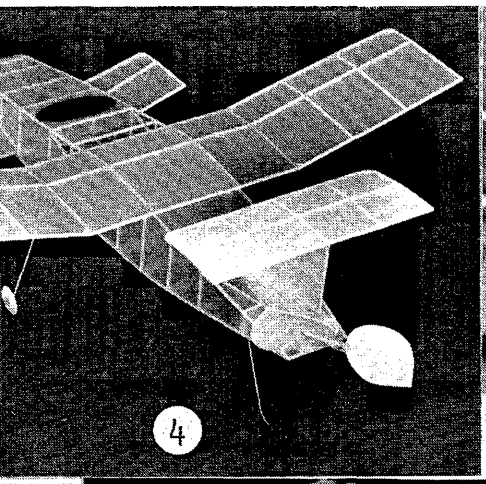
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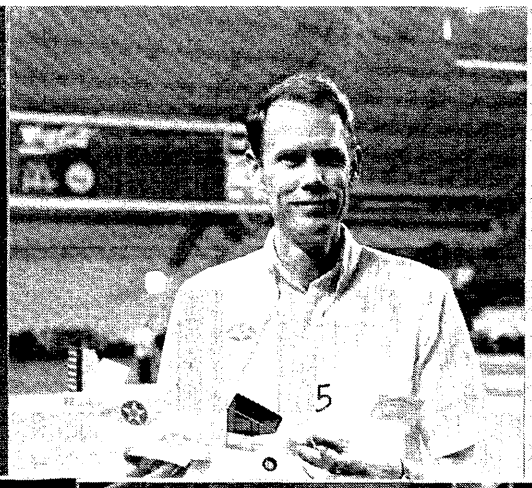
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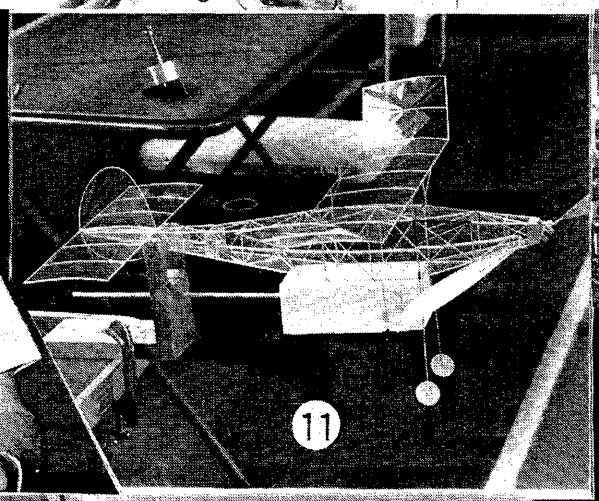
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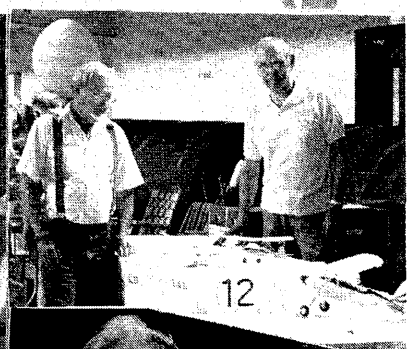
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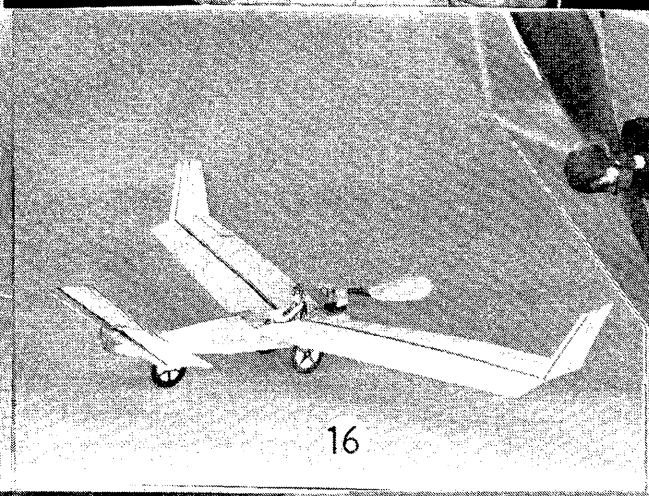
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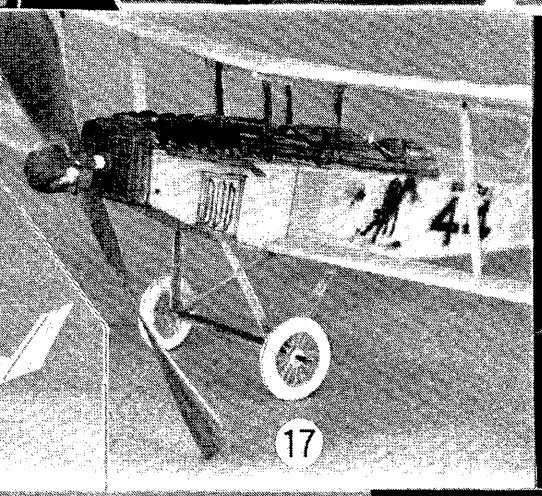
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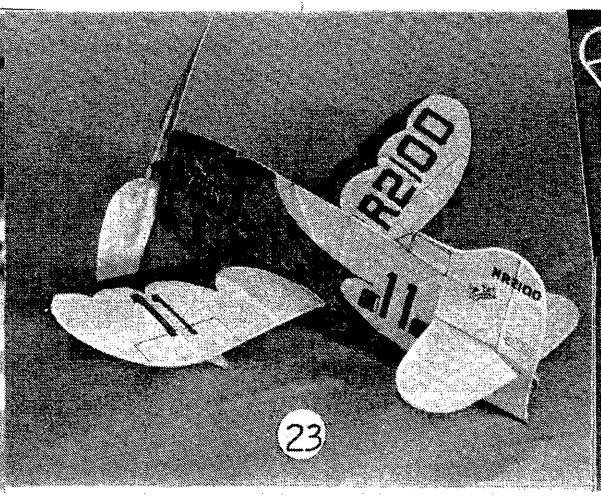

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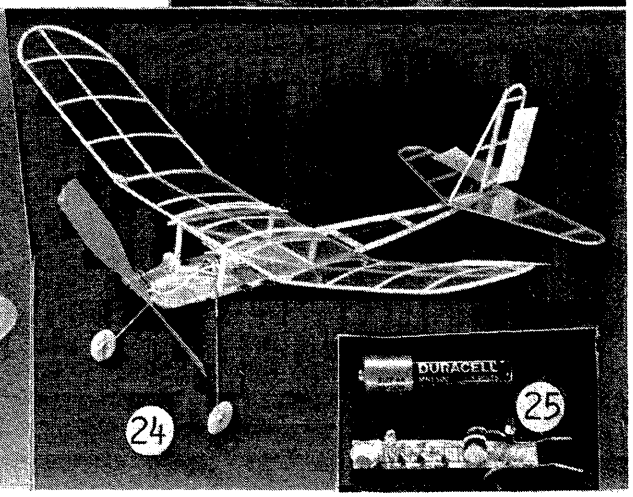

24 25

INAV
Indoor News
and Views

1025 Cedar Street
Catawissa, MO 63015
314-271-2243

80-81-82

USA SWEEPS

INDOOR F 1 D CHAMPIONSHIP

1ST - STEVE BROWN

2ND - CESAR BANKS

3RD - BOB RANDOLPH

* *
* TO: INDOOR NEWS & VIEWS (INAV) *
* 1025 CEDAR STREET *
* CATAWISSA, MO 63015 *
* *
* ENCLOSED:_____FOR RENEWAL_____*
* NEW SUB _____*
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* NAME_____*
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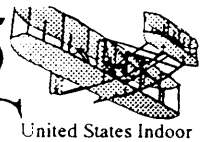
1995 USIC



United States Indoor Championship

EDITORIAL

By Larry Coslick

The paper work is almost completed for Johnson City, Tennessee to host the 1995 USIC contest for the best indoor fliers in the world! Gary Underwood has acquired the Mini-Dome for five days, beginning with a practice day on May 31. Practice will start at 8:00 am and run until 5:00 pm. The contest will officially begin at 5:15 pm on May 31 with F1D, Hand Launch Stick, 35 CM and ROG Cabin.

Most of you approve of the schedule as published. We incorporated a few changes per your suggestions. We have moved unlimited rubber speed away from the scale events, in the hope of drawing more contestants to this interesting event. Scale events have been crammed into two days in the past, with as many as eight events scheduled in a four hour period. In 1995, we have scheduled three days for scale and no more than five events in a four hour period. Our wish is to have most of the events completed by 6:00pm, so that our senior citizens (the lifeblood of our organization) will be able to endure the schedule.

Since the 1995 USIC will run for five days, we are inviting the overseas fliers to plan a trip to Johnson City. You will not be disappointed. This is an opportunity to fly in one of the best flying sites in the United States.

A heartfelt thank you to those who have contributed to the 1995 USIC maintenance fund. As of today, we are still $1000 short of our goal, so any donations will be much appreciated. We are striving to make this the best ever indoor championship!

We still have some rooms available at the Buffalo Hills Country Club at $29.77. Call Roy White 314-271-2243 for reservations.

Thanks to all who contributed information for this issue of the newsletter. We appreciate it greatly. Please keep sending us your news items.

If anyone wishes to be a CD or event director, please let us know. We need all the help we can get.

****

Great Reports From F.A.I.

By Larry Coslick

Hey, Guys, there's a great supply of new 1/8 inch rubber from F.A.I. We were running short of outdoor rubber and ordered 20 pounds of 1/8 inch from batch 6/94 and 8/94. I tested it as soon as it arrived and they both tested slightly over 4100 ft./lb. per pound. I got slightly more stretch out of the 8/94 batch and at 71 F, there was very little tearing at the knot. We have been hearing reports that Tan II breaks very easily at temperatures above 90 degrees. I was at the SAM champs and was breaking in a motor, and I broke several strands at 60% winds. The air temperature was 90 degrees. **8/94 IS THE BEST**

NEW CATEGORY IV RECORDS SET AT AKRON!

Over the Labor Day weekend at Akron, Ohio, CHRIS SYDOR set three new senior records - 1:50 in Standard Catapult Glider & 1:55 in unlimited Catapult Glider. Chris also pushed his Limited Penny Plane close to the ceiling and had a record flight of 13:20. Great job!

STAN CHILTON put up two great flights in F1D of 45 and 46 minutes and wrapped it all up by setting a new Intermediate Stick record of 40:06 using a variable pitch prop. Hearty Congratulations to both of you!

****

Thoughts to Ponder

He who laughs, lasts.

Talk is cheap because the supply exceeds the demand.

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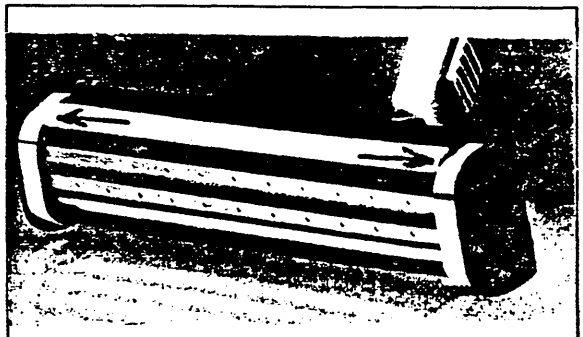
Building Techniques

Ran Ganser has developed a new technique for making **prop bearings** for EZB's and Mini Sticks using clips found on Gillette Sensor disposable razors.



Gillette Sensor Razor

The clips are left on the razor and a 1/8 in. spacer block and scribe are used to mark lines on each end prior to drilling with a No. 77 (.018) drill. After drilling, the clips are removed from the razor for filing and trimming.

MORE ON PAGE 15.

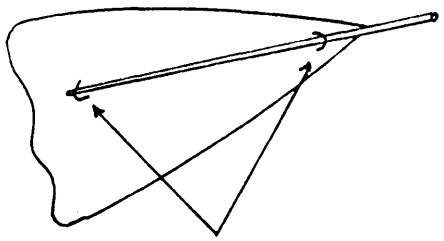
PROP CONSTRUCTION TIP

By LARRY COSLICK

Here's an easy way to hold and position prop blades to spar while glue sets for Ministick, EZB, Ltd. Penny, etc.

Instructions: Affix blade to spar with music wire staples. Wire size varies with project (.010 or larger). Tack glue blades at spar tip and hub with thinned aliphatic or solvent cement. Set desired pitch. When dry, place small drops of glue every 1/4" along the prop spar. When dry, remove staples.

****



Music Wire Staples

New Cat. IV Records at Lakehurst

Tom Green Limited PP. 17:03

Tony D'Alessandro Penny Plane 19:21

481 Woodhill Rd.
Wayne,PA 19087
18 July,1994

Back about May of this year Larry Coslick called me and asked if I would provide the plan for my LPP for publication in INAV.I said I would,so here it is,belatedly.

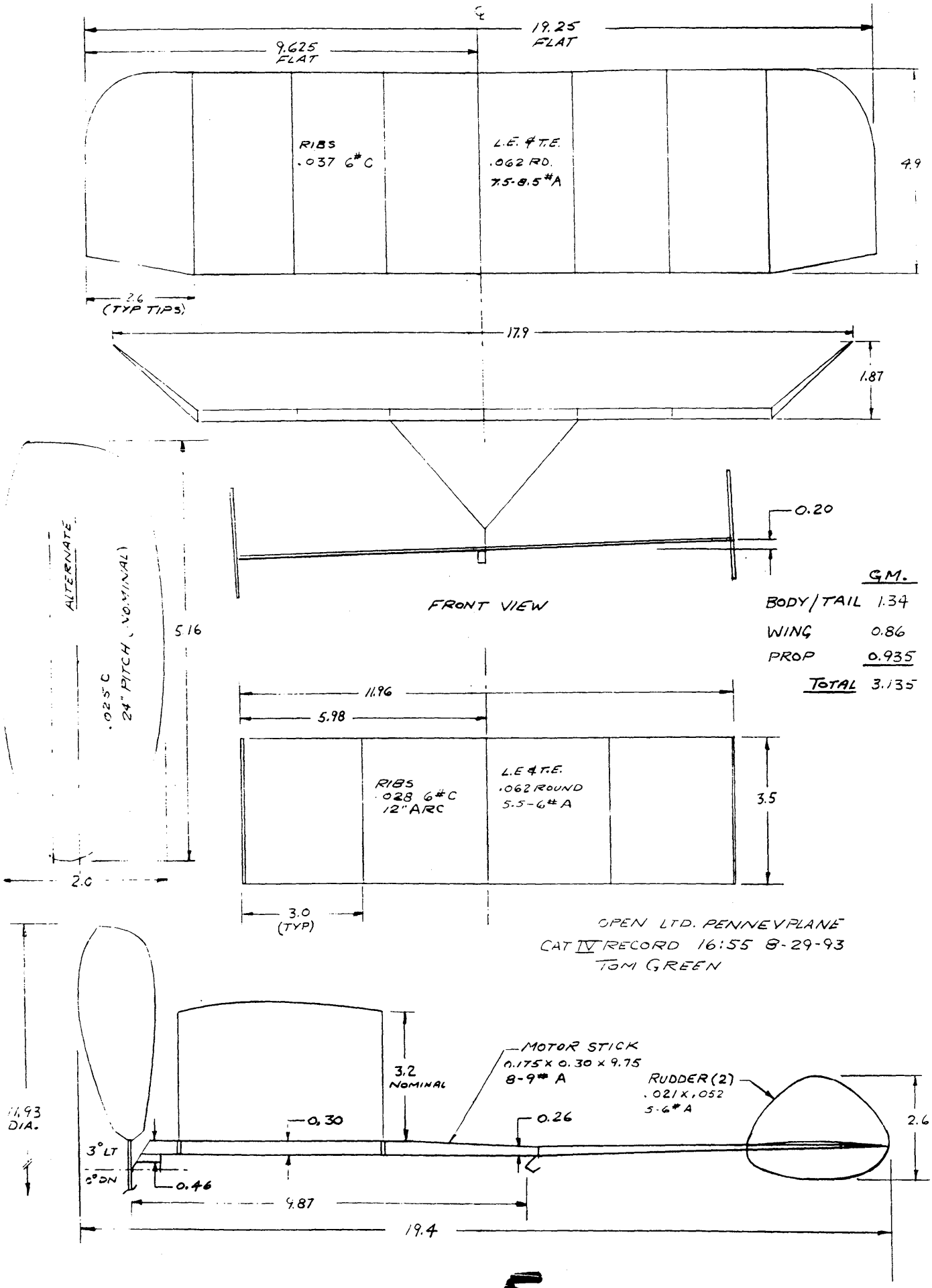
I think everything of importance is on the drawing.Can't swear that all wood densities are accurate,my records aren't that good.

A word about the propeller;I fly mostly at Lakehurst and I like to take advantage of the 170' ceiling height.For that reason I use a "reverse-flare" propeller (fwd.spar location on the prop blade dwg.).This configuration provides a fast climb to high altitude,though at the cost of high initial RPM and consequent loss of turns.This problem can be minimized,though not eliminated,by matching propeller pitch and motor size to suit the flying site and ambient air conditions.I recommend the alternate spar location shown on the prop blade drawing for all but very high ceilings and the conventional "forward-flare" propeller for low ceilings.

If you have any questions give me a call at 610-688-8474.

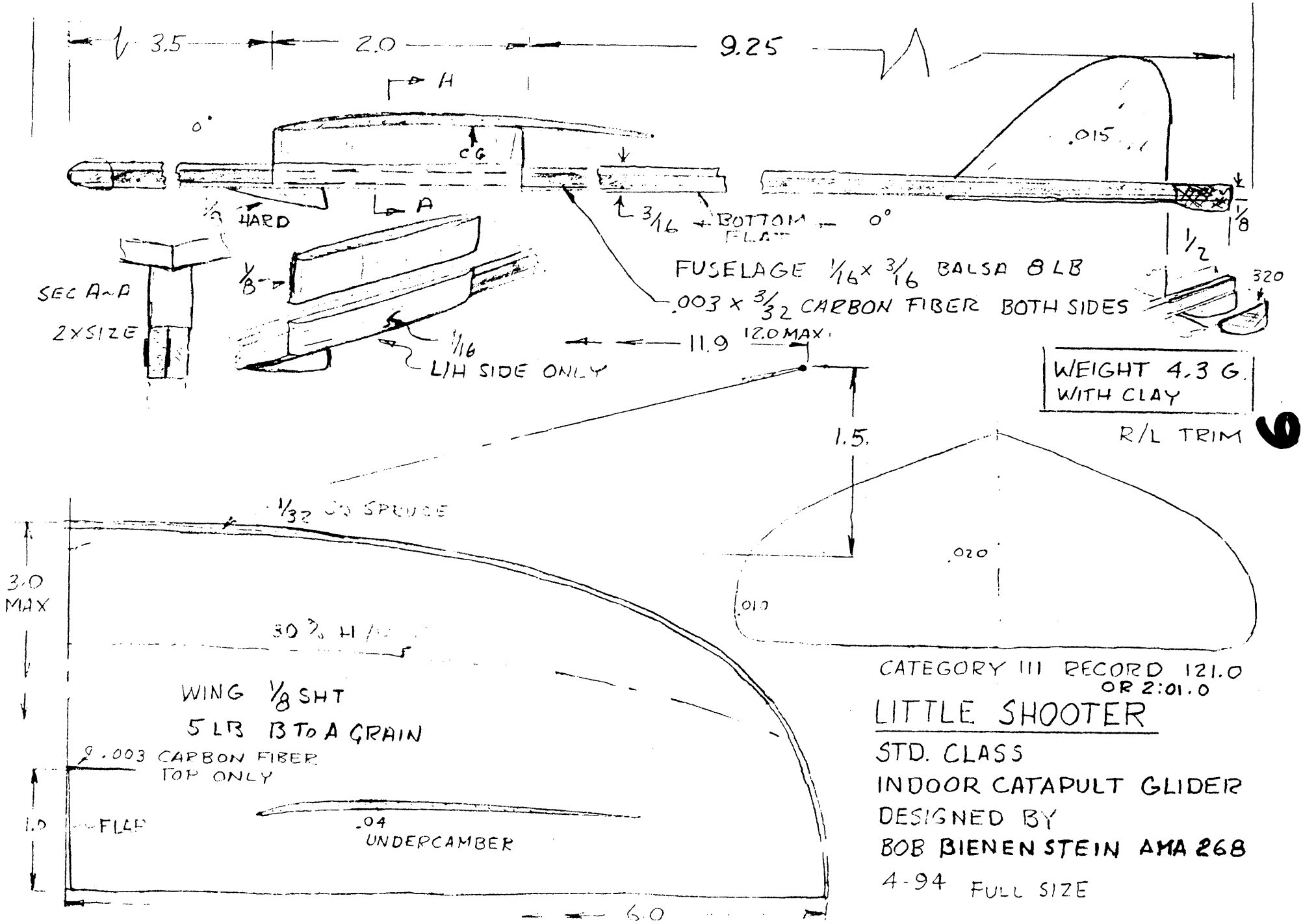
Best Regards,

Tom Green



GM.	
BODY/TAIL	1.34
WING	0.86
PROP	0.935
TOTAL	3.135

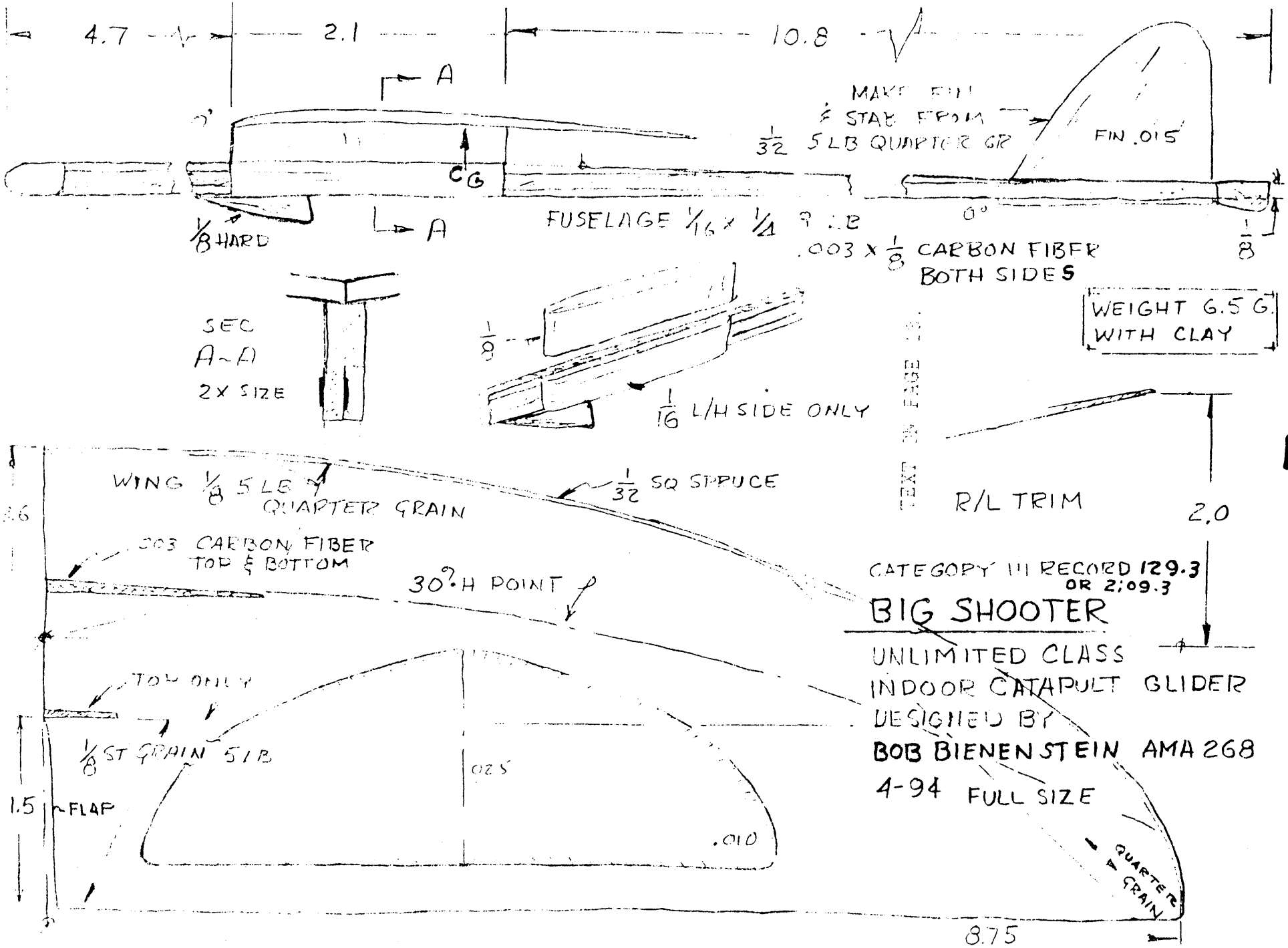
OPEN LTD. PENNEVPLANE
CAT IV RECORD 16:55 8-29-93
TOM GREEN



CATEGORY III RECORD 121.0
OR 2:01.0

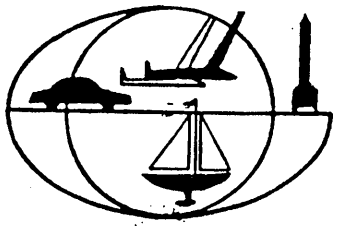
LITTLE SHOOTER

STD. CLASS
INDOOR CATAPULT GLIDER
DESIGNED BY
BOB BIENENSTEIN AMA 268
4-94 FULL SIZE


4.7
2.1
10.8
A
CG
MAKE FIN & STAB FROM 1/32 5 LB QUARTER GR
FIN .015
1/8 HARD
A
FUSELAGE 1/16 x 1/4 3 LB
.003 x 1/8 CARBON FIBER BOTH SIDES
1/8
WEIGHT 6.5 G. WITH CLAY
SEC A-A 2X SIZE
1/8
1/16 L/H SIDE ONLY
TEXT
R/L TRIM
2.0
WING 1/8 5 LB QUARTER GRAIN
1/32 SQ SPRUCE
.003 CARBON FIBER TOP & BOTTOM
30% H POINT
TOP ONLY
1/8 ST GRAIN 5 LB
FLAP
1.5
.025
.010
QUARTER GRAIN
8.75
CATEGORY III RECORD 129.3 OR 2:09.3
BIG SHOOTER
UNLIMITED CLASS
INDOOR CATAPULT GLIDER
DESIGNED BY
BOB BIENENSTEIN AMA 268
4-94 FULL SIZE

THE 17 TH FAI WORLD CHAMPIONSHIPS
FOR INDOOR MODELS F1D
SLANIC-PRAHOVA. ROMANIA, 20-25 SEPT. 1994

Final Results - SENIORS



INDIVIDUAL RESULTS FOR ALL COMPETITORS

lace	#	Name	Country	Rnd 1	Rnd 2	Rnd 3	Rnd 4	Rnd 5	Rnd 6	Best Round	2nd Best	Total
1	77	Steve Brown	United States of America	9:43	42:15	43:48	43:50	39:15	38:15	Rnd 4	Rnd 3	87:38
2	75	Cezar BANKS	United States of America	44:23	39:57	14:20	4:18	26:42	35:36	Rnd 1	Rnd 2	84:20
3	76	Robert RANDOLPH	United States of America	35: 8	38: 7	41:23	35: 0	42:17	12: 0	Rnd 5	Rnd 3	83:40
4	59	Andras REE	Hungary	40:17	41:23	38:15	40:45	0:50	1:11	Rnd 2	Rnd 4	82: 8
5	83	Corneliu MANGALEA	Romania	10:27	41:15	39:21	8:43	35:30	37:38	Rnd 2	Rnd 3	80:36
6	58	Dezso ORSOVAI	Hungary	37: 5	28:55	10:56	39:10	36:30	34:32	Rnd 4	Rnd 1	76:15
7	81	Aurel POPA	Romania	10:54	40:21	35:54	14:15	22:12	14:54	Rnd 2	Rnd 3	76:15
8	82	Vasile NICOARA	Romania	32:32	38: 4	35:53	32:20	37:16	35: 7	Rnd 2	Rnd 5	75:20
9	64	Hideyo ENOMOTO	Japan	30:46	35:48	15:40	26:16	37:47	30:55	Rnd 5	Rnd 2	73:35
10	65	Edward CIAPALA	Poland	34:47	34:27	29:53	30:32	37:28	33:41	Rnd 5	Rnd 1	72:15
11	28	Dieter SIEBENMANN	Switzerland	22:53	0: 9	11:52	33:35	34:23	36:27	Rnd 6	Rnd 5	70:50
12	27	Rene BUTTY	Switzerland	36:20	23: 4	30:56	24:54	23:42	32:33	Rnd 1	Rnd 6	68:53
13	66	Jan DIHM	Poland	34:43	15:40	32:19	28:35	31:25	1: 6	Rnd 1	Rnd 3	67: 2
14	61	Peter KUTTLER	Germany	31: 4	1:20	16: 6	30:45	35:10	23:53	Rnd 5	Rnd 1	66:14
15	60	Thomas MERKT	Germany	0: 2	24:27	33:40	32:22	26:23	29: 8	Rnd 3	Rnd 4	66: 2
16	57	Ferenc BAKOS	Hungary	25:25	1:49	24:52	30:31	31:46	30:28	Rnd 5	Rnd 4	62:17
17	56	Pentti NORE	Finland	24:32	28:43	19:39	29:20	30:41	23: 3	Rnd 5	Rnd 4	60: 1
18	71	Victor ORLOV	Russia	26:44	29:35	30: 6	24:13	29:54	24:28	Rnd 3	Rnd 5	60: 0
19	23	Robert CHAMPION	France	30:45	13:35	26:25	24:44	18:55	27:37	Rnd 1	Rnd 6	58:22
20	93	Lu XIUSEN	China	23:13	2:46	28:18	28:45	0: 0	0: 0	Rnd 4	Rnd 3	57: 3
21	73	Alexandr ROMASHOV	Russia	0:17	28:54	0:40	13:52	28: 6	0: 0	Rnd 2	Rnd 5	57: 0
22	67	Sylvester KUJAWA	Poland	28:28	25:39	17:25	27:50	1:17	13: 1	Rnd 1	Rnd 4	56:18
23	62	Lutz SCHRAMM	Germany	0: 0	26:57	13:31	21:35	0:10	28:45	Rnd 6	Rnd 2	55:42
24	24	Jean-Marie CHABOT	France	23:21	16:41	11:25	17:38	0:37	30: 5	Rnd 6	Rnd 1	53:26
25	94	Gao GUOJUN	China	5:27	0: 0	19: 8	22:12	25:26	25:21	Rnd 5	Rnd 6	50:47
26	95	Chen GANG	China	14:28	0: 0	24: 8	0: 0	19:53	26:38	Rnd 6	Rnd 3	50:46
27	87	K. GERSHTENTSVEIG	Ukraina	0: 0	0: 0	24:10	18:30	25:25	24:56	Rnd 5	Rnd 6	50:21
28	54	Leif ENGLUND	Finland	0: 9	9:41	18:10	8:54	23:38	26: 5	Rnd 6	Rnd 5	49:43
29	72	Anatoly PETROV	Russia	20:18	28:54	2:15	18:29	1:39	4:18	Rnd 2	Rnd 1	49:12
30	25	Bernard TRACHEZ	France	25: 3	19:20	18:29	21:51	19:37	22: 7	Rnd 1	Rnd 6	47:10

Team Member Report
The 1994 Indoor World Championships
Slanic, Romania

by Steve Brown

The 1994 U.S. Indoor Team's trip to the salt mine in Slanic, Romania was a success and a great experience for each of us. The team placed first, with Brown, Banks and Randolph winning the gold, silver and bronze medals individually. The salt mine is unlike any other flying site in its height (208 feet), the 50 degree temperature, and its lack of illumination. It was uncharted territory to those of us accustomed to the balmy air of Santa Ana. Only Banks, who had flown there in 1982, and Team Manager Bud Romak had first-hand knowledge of the mine.

Each day began and ended with a 22 mile bus ride from our hotel in Ploesti through farm country to Slanic. As we stepped from the mine elevator we would gaze in wonder at an enormous structure that resembled an underground cathedral.

The salt mine has a nasty reputation as "a terribly difficult place to fly." In response to past criticism the organizers maintained strict crowd control during most of the contest, minimizing the ground turbulence and severe drift that caused so much grief in 1982. Flying conditions on the first two days were good, with mild side-to-side drift. It is an unforgiving site, however, and so it was critical that the model be launched so that it would be centered in the relatively narrow (109 feet) width of the floor. Models that did not have a tight circle and stable pattern after launch would quickly hit the opposite wall before the hapless flyer could steer. The walls seemed to be made of Velcro.

Cezar Banks issued a wake-up call in the first round by posting an outstanding time of 44:23. My first round flight hung on a light below the catwalk. Before one of the mine personnel could retrieve it I saw a little puff and pieces of model began to descend. The hot light had melted the motor. It was an expensive way to learn the right launch torque, which turned out to be about 170% of typical Santa Ana torque.

The walls and the darkness began to take a toll on our models as the contest progressed. Banks lost his two best ships by the end of the second day. Randolph struggled with difficult launches to post a 41:23 in the third round and a 42:17 in the fifth, securing the team gold medal for the U.S.

Conditions began to deteriorate on the third day when the crowd control was relaxed. My best model hit the wall in the fifth round while I stood philosophizing with the Romanian team about the necessity of steering it. The model I selected for the sixth refused to climb to the ceiling. Having flown first in the round six, I could only sit and wait to find out if Banks, Randolph or Andras Ree (who was having a great World Championship) would produce another big flight.

Speculation about the behavior of Tan II in the cold, damp air of the mine provoked anxiety before the contest. Reports from the Romanian team had indicated that it might "grapevine." Bernard Hunt had predicted that cruise torque might be reduced by about 25% at 50 degrees, which seems to have been correct. I did not encounter "grapevining" or the unpredictable breakage that I have come to associate with this super rubber.

To go to such a far away place and return with the championship is a dream come true. It is especially meaningful to have had fellow team members like Cezar Banks and Bob Randolph. These are the gentlemen from whom I learned to fly F1d. Both are relentless competitors and either could have won the gold medal.

A special note of appreciation must go to Team Manager Bud Romak. Aside from obtaining special handling for our boxes and arranging all the details of the trip, Bud kept us relaxed and focused with his humor and low-key advice. Dr. Herb Robbins and Dr. Vern Hacker, and Larry Parsons also lent support, especially in tracking the models in the darkness, which was often a two- or three-person job.

The Romanian Modeling Federation is to be congratulated for all that they accomplished with limited resources. While the hotel and transportation were not what we might expect in the States, they did not detract from the experience for me. Instead, they formed part of a picture of a country emerging from a troubled past.

I would also like to thank the A.M.A. for sponsoring our trip to Slanic. It is a great feeling to know that your team has traveled 6,000 miles and returned with first place.

CHOOSING MOTOR SIZE FOR VARIABLE PITCH PENNY PLANE PROPS IN LOW CEILINGS

By Jim Clem

I was asked to write about choosing rubber size for variable pitch P.P. props. At Oklahoma City, Larry Coslick had chosen a large cross-section, short motor with the prop set with high pitch and a low RPM. Although he had optimum trim and used most of the turns, he ran out of turns at 10+ minutes. I used a cross-section motor smaller and slightly longer that would take more turns. The prop was set at a lower pitch and higher RPM. In proper trim, this combo was good for 11+ min.

For 60 years, indoor modelers have strived for lower and lower RPM. This has been our tunnel vision! The Federation ROG has changed this vision! This 3.1 gm, 30 sq.in. model with a 6" plastic prop can do nearly 10 minutes! It does not matter what the RPM is on an indoor model as long as we have enough turns in the rubber motor to get the desired duration!

Enough philosophy. Specifics:

1. P.P. motors can vary in width from .090 -.115 Tan II

2. We want to determine the optimum motor for existing conditions.

3. Larger motors can be used in sites where you can "ceiling scrub."

4. Use partial motor test flights. See INAV 7/93 Bob Randolph's article, & Model Aviation, 9/91.

5. Use "O" rings.

6. Make a 'WAG' as to the best length and thickness. Use enclosed rubber charts to play "what if" with RPM. Use this RPM and the rubber charts to pick the size and length of the motor to give you the number of turns you think it will take to win the contest at this RPM.

7. From your test flights, you can establish an RPM, and this eliminates one variable in your 'WAG' equation.

8. You want to land with as few turns as possible. (6% to 8%)

9. Remember that small cross section, short motors weigh less, so lower the overall wing loading.

10. Set the hi-pitch stop for a very high pitch (46"), and the lo-pitch stop for low pitch (15").

11. The model does not climb above head high (and may actually descend) in the first 1-1/2 to 2-1/2 min. of flight. Adjust switch-over point with tension screw. The model then climbs just to the ceiling and descends to the floor.

12. Think about the greatest secret of all in indoor flying. Any well-built, proven design will be a winner if the prop and rubber combination is optimum. These are steps for trying to achieve that combination.

Examples for a place to start:

I. 4-18-93 Bedford TX Cat I Record 12:46

Motor: .119 x .040 x 21
Weight: 3.28 gm
Turns: 1533

Turns Remaining: 87 (6%)
Torque: 1.16 in.oz.

Lo-Pitch: 15.41
Hi-Pitch: 46.23"
(Model on ceiling to 11:30)

II. 3-6-94 Oklahoma City, OK Cat II, 1st place P.P. 11:17 (altitude used: 35 ft.)

Motor: .100 x .044 x 15
Weight: 2.14 gm
Turns: 1440
Turns Remaining: 125 (8.7%)
Torque: .8 in.oz.

Lo-Pitch: 15.1"
Hi-Pitch: 46.23"
RPM: 116

Bob Randolph's absolute world record of 55+ minutes proves that V.P. props are the way to go in any ceiling!! (The best I have been able to do is 14 mins, in Cat IV) I was also asked to write about winding technique.

1. Use Armorall, Dow Corning #33 Silicon Grease, Castor oil, or favorite lube.

2. Stretch motor to four times its made-up length, five times at the most. (More will lead to prema ture crystallization of the rubber.)

3. Put in half the desired turns rapidly.

4. Pause at this point to allow both rubber and the rubber winder to relax. Move the rubber gently in and out to align the knot ting.

5. Give the rubber a little slack and continue winding slowly.

6. Keep an eye on the torque meter as it climbs, and as you relax the motor, ob serve the torque. It should go lower. When you pull the motor back, if the torque follows you right on back, it's time for more slack!

7. Continue in this manner until the desired turns and hook length are reached. It will take about five minutes to wind a motor in this manner.

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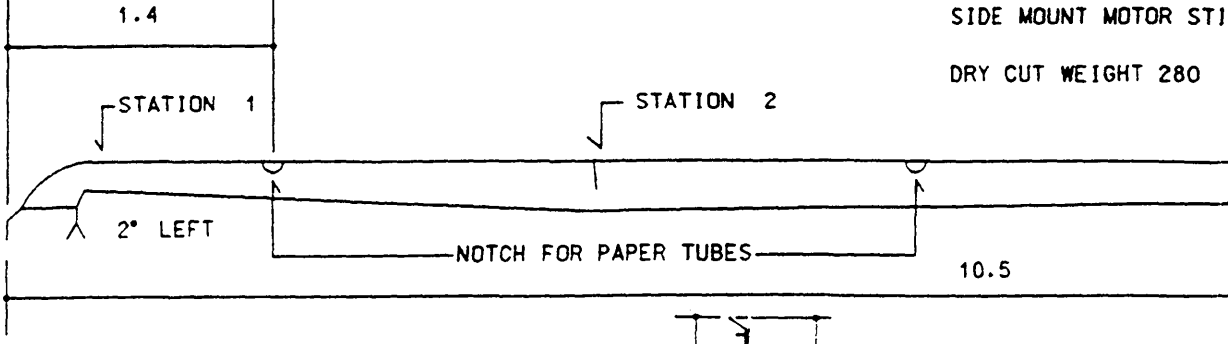
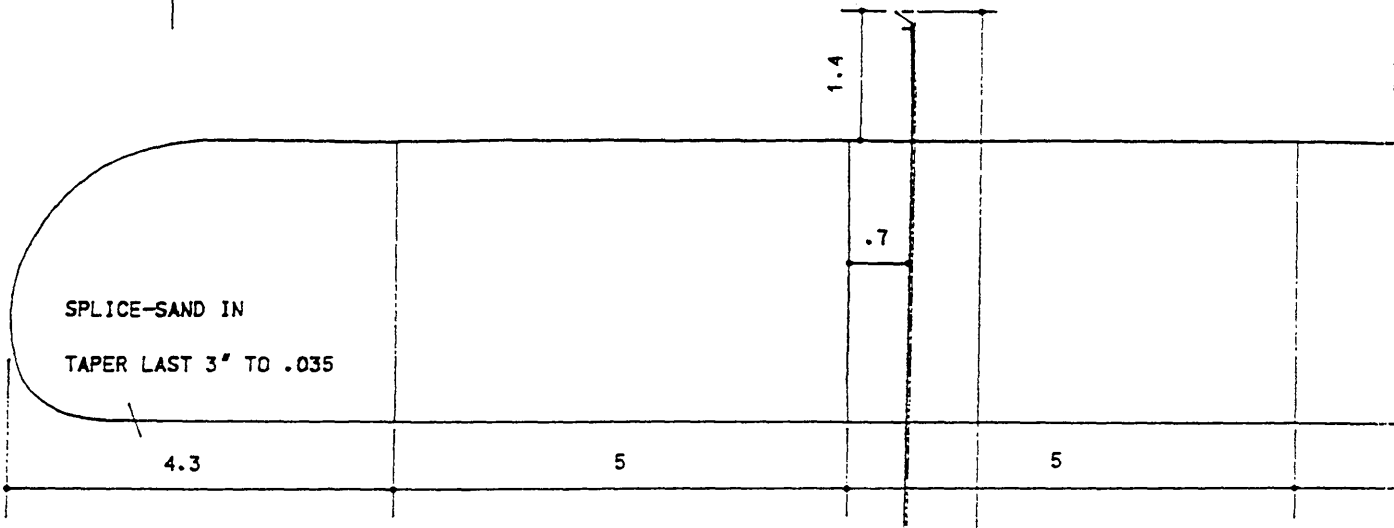


SIDE MOUNT MOTOR STI

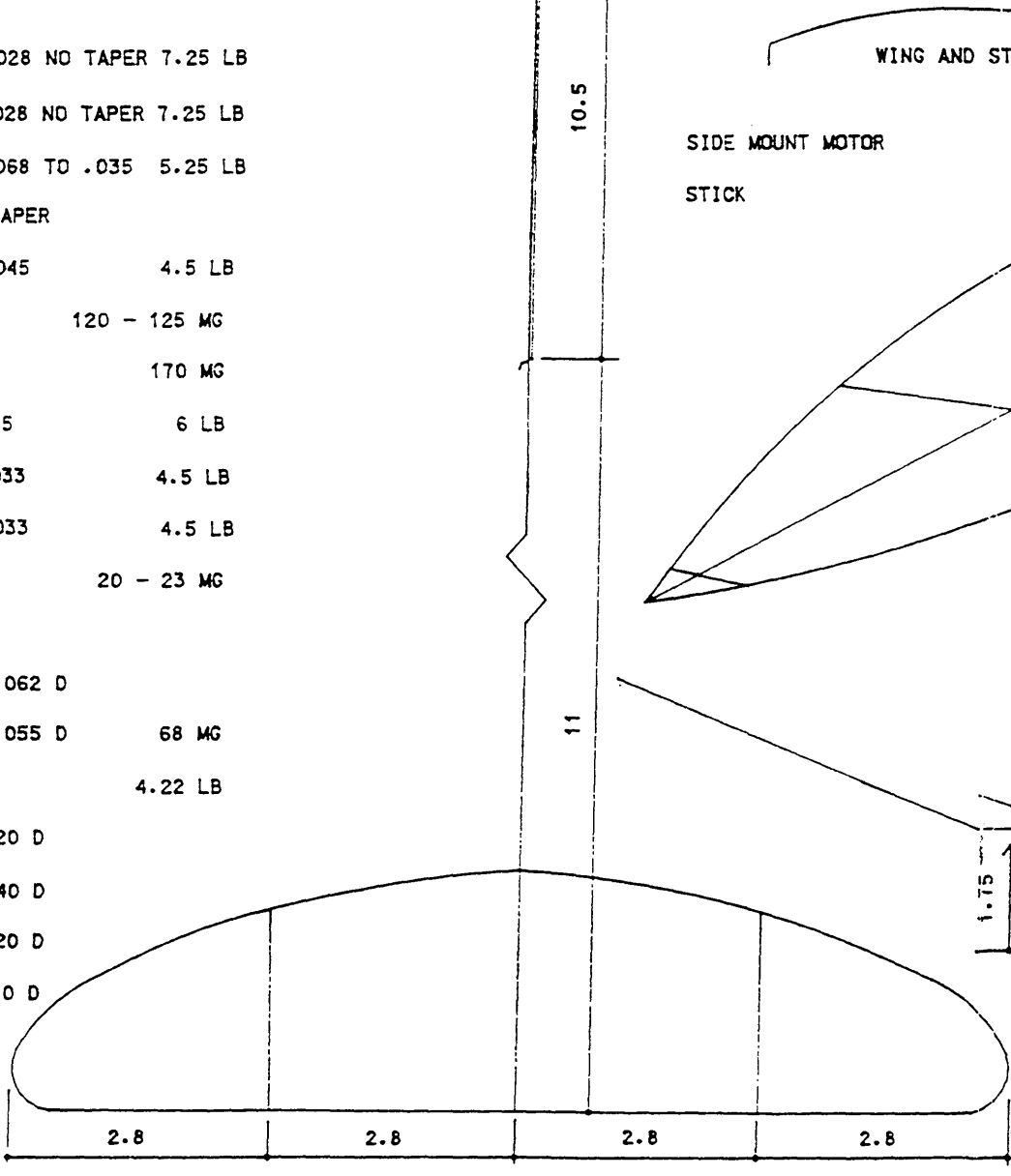
DRY CUT WEIGHT 280



WING

L/E CENTER SECTION	.068 X .028 NO TAPER	7.25 LB
T/E CENTER SECTION	.059 X .028 NO TAPER	7.25 LB
L/E TIP	.022 X .068 TO .035	5.25 LB
T/E	SEE WING OUTLINE FOR TAPER	
WING RIBS (3)	.018 X .045	4.5 LB
WING DRY WEIGHT		120 - 125 MG
WING COVERED		170 MG
WING POSTS	.062 X 1.5	6 LB
STAB	.022 X .033	4.5 LB
STAB RIBS	.018 X .033	4.5 LB
STAB DRY		20 - 23 MG
STAB TILT 1/8"		
BOOM 11" FRONT	.080 W X .062 D	
REAR	.055 W X .055 D	68 MG
M/S C GRAIN	10.5"	4.22 LB
STATION 1	.150 W X .120 D	
STATION 2	.250 W X .140 D	
STATION 3	.210 W X .120 D	
STATION 4	.165 W X .110 D	

WING AND ST



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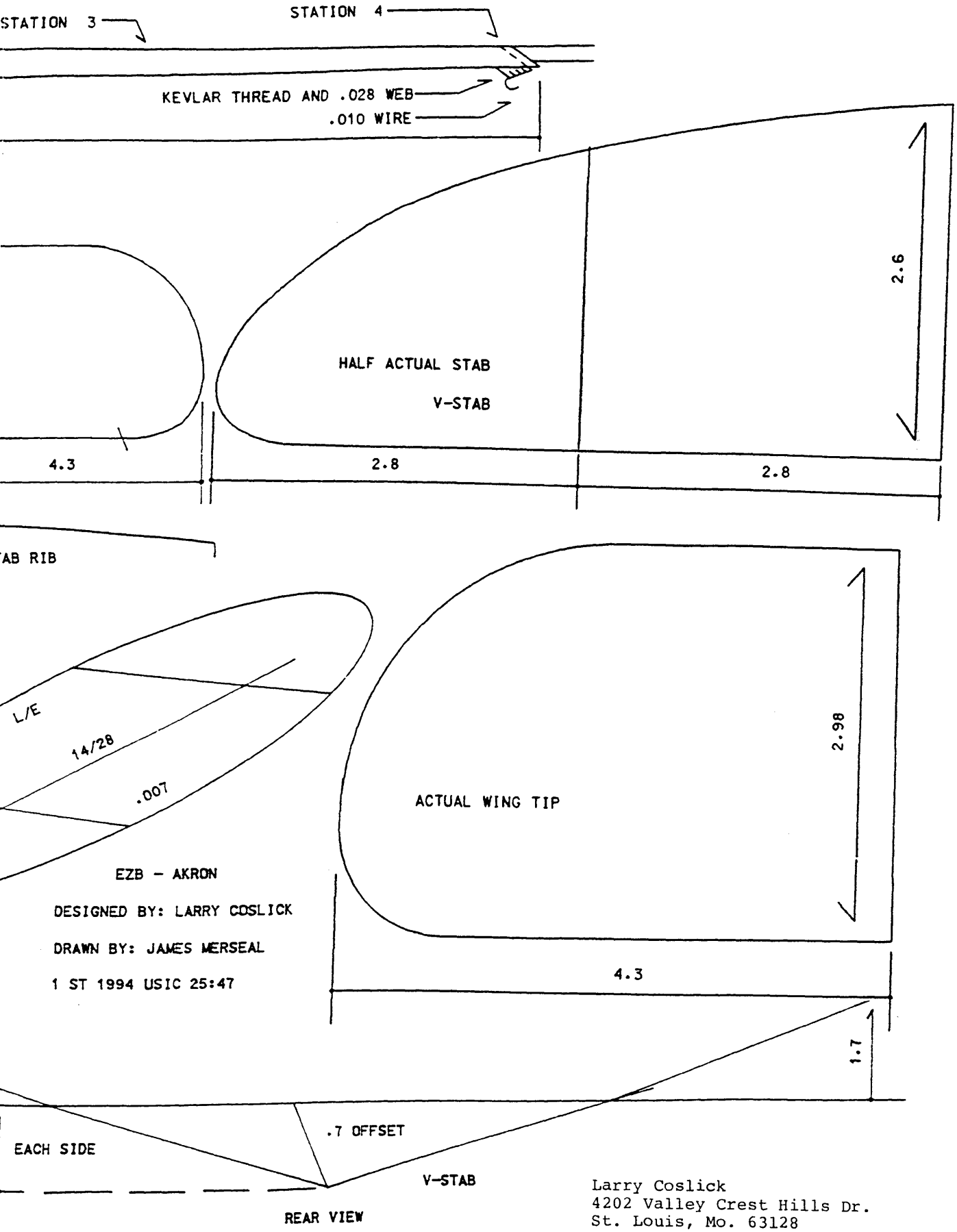
MG



Larry Coslick
4202 Valley Crest Hills Dr.
St. Louis, Mo. 63128
Tel. 314 892 3803
Fax. 314 296 4554

THE FOLLOWING WAS TO HAVE BEEN PUBLISHED BY LES GARBER - THANKS LES

EZB Weight Data

November 1993

WOOD SIZES, DENSITIES, AND WEIGHTS:

Motor Stick	Size: .160D x .080W to .240D x .120W to .160D x .080W x 9.5 in. L. Density: 3.7 lb/ft^3. Weight: .191 gm. (Note: Outstanding quality balsa!)
Tail Boom	Size: .090D x .075W to .045D x .040W x 11.5 in. L. Density: 4.2 lb/ft^3. Weight: .051 gm.
Front Wing Spars	Size: .070D x .030W to .035D x .022W x 10 in. L. Density: 6.5 lb/ft^3. Weight: .027 gm @ 10 in. L before cutting to final length.
Rear Wing Spars	Size: .065D x .027W to .030D x .025W x 10 in. L. Density: 4.0 lb/ft^3. Weight: L. spar: .020 gm @ 10 in. L. R. spar: .018 gm @ 10 in. L.
Wing Ribs	Size: .030D x .019W. Density: 4.0 lb/ft^3. Weight: 5 ribs .006 gm.
Stab Spars	Size: .040D x .020W to .020D x .020W to .040D x .020W x 15 in. L. Density: 5.5 lb/ft^3.
Stab Ribs	Size: .025D x .019W. Density: 4.0 lb/ft^3.
Fin Frame	Size: .020D x .020W. Density: 5.0 lb/ft^3.
Wing Posts	Size: .047 Dia. x 1 in. L. Density: 5.5 lb/ft^3. Weight: 2 posts, .009 gm.
Prop Spar	Size: .028 Dia. to .059D x .052W to .028 Dia. x 12 in. L. Density: Center 3 in. section: 6.0 lb/ft^3. Outer 4.5 in. tips: 4.0 lb/ft^3. Weight: .032 gm. (Prop spar + .010 shaft + Teflon washers: .049 gm).
Prop Blades	Size: .005/.006 in. Quarter Grain (Sand to dimension on glass sheet). Grain at 30 deg. to prop spar. Glue blade sections together with .06 lap joints before cooking (220 F, 20 min.) on form. Density: 4.0 lb/ft^3 (As low as possible). Weight: .045 gm finished weight for each blade.

FINISHED COMPONENT WEIGHTS:

Flat wing frame	.112 gm
Covered flat wing frame	.192 gm
Covered wing w/ posts & dih.	.205 gm
Stab frame	.030 gm
Covered stab	.070 gm
Fin frame	.003 gm
Covered fin	.009 gm
Total wt. Ultra film + 3M-77	.126 gm
Propeller bearing (.010 MW)	.006 gm
Motor stick (MS)	.191 gm
Motor Stick+Prop Bring (PB)	.208 gm
MS + PB + Rear Hook	.214 gm
MS + PB + RH + Tis. Tubes	.217 gm
Tail Boom	.051 gm

ULTRA FILM + 3M-77 SPRAY WEIGHTS:	
Wing Ultra Film + 3M-77:	.080 gm
Stab Ultra Film + 3M-77:	.040 gm
Fin Ultra Film + 3M-77:	.006 gm
TOTAL Ultra Film + 3M-77:	.126 gm

FINISHED WEIGHTS:	
Body + Tail:	**0.352 gm**
Wing + Posts:	**0.205 gm**
Propeller:	**0.149 gm**
TOTAL WT:	**0.706 gm**

(Note: Data typical for 3 EZB's that built in 1990. Best time: 22:03 91 USIC Johnson City)

AKRON SETUP PROCEDURE FOR 30 MINUTE EZB

By Larry Coslick

1. Use C grain balsa for the side mount motor stick to get more torsional resis tance to twist since the M/S is quite long. Use 4.2 lb. balsa or under and the C grain must show on the wide or top side and A grain will be on the side.

2. The boom is a very impor- tant part of this design. Flex it too much and the model will hang on the prop at launch instead of a nice steady climb. You will need to change to a stiffer boom if this hap pens.

3. Mount the boom 1 degree negative.

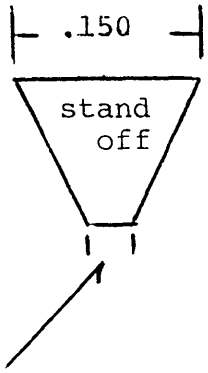
4. Use a 3 percent airfoil on the stab instead of the one shown on the plan.

5. The wing is set with 1.5 degree negative incidence.

7. Mount the stab with two stand offs cut from .022, 4.5 lb. balsa. I cut a triangle with each side .150 inches, then cut off one of the tips to match the width of the boom. The standoffs can be mounted directly to the face of the spars or they can be cut to fit under the spars.

8. Motor size used on the 30 minute flight was .045 x 16 inches.

wing---	200 mg
stab---	55 mg
boom---	68 mg
M/S---	332 mg
prop---	180 mg
	835 mg



Width of boom

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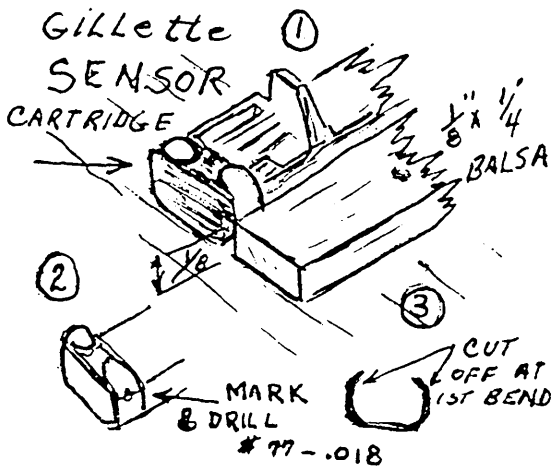

EZB and Mini Stick Prop Bearings

CHILTON'S CORNER
By Stan Chilton

Photo of Stan Chilton at work, taken in model airplane department of Orr's Downtown book store, Wichita, year 1942. Small square sign above Chilton's head and below the ceiling light reads "No glue without empty tube." Larger sign on counter to Chilton's right announces a contest for gas, rubber and glider, 50 cents entry fee for each.

Sharing ideas of model construction and flying helps raise the proficiency of all of us who build and fly model airplanes.

In this column I'll share some of my ideas and construction methods. They may not be the best but they are what I use. I hope some of you may find this column helpful.

The most important points in indoor model construction are to build your model as light as possible, but strong enough to fly. If you never break a model then it is too strong (also too heavy) but if it continually breaks it is too frail (too light). You cannot be a consistent winner if you're spending too much time repairing your model.

Every building tip offered here will present methods of building stronger, lighter, more accurate models to insure that successively built models are built as close as possible to the original but with any intentional modifications.

CEMENT: or GLUE. We'll start off with the old reliable acetate (or butyrate) based cement we've all used for years.

My favorite starting cement base is "Duco" household cement, which comes in 1¾ ounce tubes and is generally available at K-Mart stores, as well as most hardware stores. Acetate cements from IMS (Indoor Model Supply) and Micro-X can also be used.

I use six or seven different mixtures utilizing the Duco base in my construction. I prepare 5 one ounce bottles labeled 1 through 4, and 1A. I like the square bottles with a cone shaped teflon plug (gasket) in the lid. This type of lid will always be easy to unscrew.

Bottle #1 is Duco thinned with acetone close to 1 to 1. I use this for rib to spar joints, motor stick posts and wherever I need a good strong joint. All joints are double glued. Coat each surface, wait a few seconds then apply cement to one surface and press parts together for 10 seconds. I'll cover the different kinds of applicators next month including my favorite, a formed teflon glue stick.

Bottle #1A is the same viscosity as #1 but it has 2 to 3 drops of plasticizer tri-octyl phosphate in it. Irv Rodemsky has the only stock of this since it has supposedly been discontinued unless you buy a tanker truck of it. Irv calls it "TOF" and sells it for $5 per bottle of about 1 ounce. His address and phone number are:

Mr. Irv Rodemsky
1600 Rockspring Place
Walnut Creek, CA 94596
(510) 938-9225

The "TOF" is a dry plasticizer, compared to castor oil and TCP (tricresyl phosphate) which are sticky, and never dry. One can have a usable cement mixture even if up to 6 drops or more of TOF per ounce are added.

Except for occasional joints where I want a flexible non shrink cement the main place I use 1A is to bridge across the cut butt jointed dihedral joints of a wing before it is covered. Applied with a fine 3-0 brush, just a little is applied to hold the joint together when dihedral is put into the newly covered wing.

Bottle #2 is just a little bit thinner than #1. It is used in place of #1 when I try to save weight or just prefer a thinner cement then the thicker #1.

Bottle #3 is thinner than #2 and is about 2 parts acetone to 1 part Duco, with 3 drops of TOF per ounce. Bottle #3 is part of the secret to straight sheet ~~formed~~ ROLLED tail booms. If a cement such as #1 is used to cement the tail boom (or motor stick) seam, the result is a banana shaped tail boom. Four drops of TOF per ounce for #3 is tolerable.

Bottle #4 is a water thin mixture of acetone and Duco. The ratio is about 6 or 7 parts acetone to 1 part Duco. Bottle #4 is used only as a primer for tail boom and motor stick seams. It is applied with an appropriate size small brush (a #3 to #5 size) sparingly, but evenly to both edges of the raw seam.

The seams are then cemented with #3 cement which will dry in less than 10 seconds. The prime coat gives the #3 cement a good anchor in the balsa, which without the prime coat, #3 would be too thin to provide a good joint. As used, however, it gives a very strong seam with light weight.

The five cements described so for are all thinned with acetone and will tack dry in 10 seconds. Methyl Ethyl Ketone (MEK) may be used if you prefer a slower drying cement. I use regular lacquer thinner to thin the Duco for a slower drying cement. For a really slow dry mixture thin the Duco with a blush retarding thinner.

If any of the cements blush, it can be removed with a brush barely wet with blush retarding thinner, brushed very lightly over the blushed area.

Future columns will cover other adhesives and applicators used in indoor model construction. Feel free to call or write me if you have any questions.

Stan Chilton
300 South Topeka
Wichita, Kansas 67202
(316) 262-3538 day or (316) 686-9634 evening

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The Big and Little Shooter Category III Record Holding Std & Unlimited Class Indoor Catapult Gliders

By Bob Bienenstein

I have been flying variations of this design since 1985, mostly in low ceilings. Highest ceiling flown = 79 ft. The first designs were super-sensitive to adjust before going to the present design adding the pylon (ala Stan Buddenbohn). I also use his four piece wood layout for the wing on the unlimited glider. Both gliders are of the flex flap design pioneered by Mike and Stan Stoy.

If you are not familiar with the pylon trimming method, start by taping the pylon to the wing, warp flaps down about 1/16. Then, tape wing to fuselage at location shown. Add weight for C/G loc. shown on plan. Adjust incidence angle by sanding bottom of pylon. When you can firmly h/launch the glider in a level launch and get a smooth recovery, glue the pylon to the fuselage. Final tweaking for right launch and left glide somewhat like a conventional H/L.

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INDOOR RUBBER MOTORS

By Dick Hardcastle

I'm sure there are similar "max turns" equations and charts from other fliers. How does my chart and formulas compare to yours? How do you determine "max winds" for a given loop of Tan II? I think a comparison of approaches from different parts of the country would be of interest to all fliers.

Here is a simple explanation of my method of determining maximum turns for a given Tan II motor. Take the formula you use to determine max turns in Pirelli rubber and multiply it by a factor of 125% to 138%. Chilton says he can get 140%. I get closer to 133%. Way back in 1968, I saw a formula to determine "N", the maximum turns for Pirelli rubber, in Indoor News & Views. I think Charlie Sotich developed the formula back in 1962. At least I'm going to credit him.

Before I get into Sotich's formulas, here are some things I've observed in handling Tan II. More records have been set using Tan II in a shorter time than were ever set using Pirelli. There's no comparison. Tan II 8-93 is the best that I've tried. Tan II is lighter and softer than Pirelli. Most use shorter loops. Tan II can't take 93 degree heat. Neither can I. I noticed this at the NATS in Lubbock. The loop would explode in the middle, way short of max torque and turns. Tan II takes longer to recover than Pirelli. It also chafes near the knot, causing nicks even after one wind.

Using Sotich's formulas, determine (N) as if the rubber was Pirelli. Then multiply this number by a factor of 1.25 to 1.35. Chilton feels he can get at least 135% of N in Tan II. I can't wind as well as he and I get 125% to 133%.

Sotich Formula

W = .046 x T x L:
W = Weight (oz)
T = Thickness
L = Length
N = 6.35 x L x Sq root L/wt

The density of Pirelli is greater than the density of Tan II. Therefore, if a loop of Pirelli and a loop of Tan II are identical in weight and length, the cross-section of the Tan II will be greater.

The size listed in the following chart assumes the second dimension to be .040.

When Sotich worked out his formula, that was the most common thickness of Pirelli stock. Tan II has a thickness on average closer to .044. So, take this into consideration.

I'm looking at one of my Tan II loops. It is 16.2" in length and has a cross-section of .044 x .046, which when multiplied out is .002024 sq ins. It weighs .037 oz. Using the formula W = .046 x T x L, I get a (T)thickness of .050. Now, if you take the cross-section area and divide by .040, you get close to .050 as the second dimension. So, instead of using .044 or .046, I would use the size .050 in the chart and get 172 turns per inch times 16.2 inches = 2786. This, of course, is just a guide and it relates only to Tan II 8-93. But I've got to start somewhere.

Using the formula W = .046 x T x L is the best way to be consistent in determining rubber size. It's quick and easy. First measure and weigh the loop. Then divide the weight by .046 and by the length and you have a size based on weight rather than measurement. Then go to the chart.

What the chart really shows is the result of the two formulas. You can get the same result quickly by using a simple hand calculator. First you take the length of the loop and divide it by the weight and press square root Then, multiply by the length, the constant 6.35, and percent increase (125%-140%)

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INDOOR RUBBER MOTORS

Approximate maximum turns (N)

HHwally wk1

SIZE .040 x size	PIRELLI WT/IN	PIRELLI TURNS/IN (N)	TAN II TURNS/IN 135A6x(N) FAI-8/93	TAN II TURNS/IN 133A6x(N) FAI-8/93	TAN II TURNS/IN 130A6x(N) FAI-8/93	TAN II TURNS/IN 125A6x(N) FAI-8/93
0.0100	0.000460	296	400	394	385	370
0.0110	0.000506	282	381	375	367	353
0.0120	0.000552	270	365	359	351	338
0.0130	0.000598	260	351	345	338	325
0.0140	0.000644	250	339	333	325	313
0.0150	0.000690	242	326	322	314	302
0.0160	0.000736	234	316	311	304	293
0.0170	0.000782	227	307	302	295	284
0.0180	0.000828	221	298	294	287	276
0.0190	0.000874	215	290	286	279	268
0.0200	0.000920	209	283	278	272	262
0.0210	0.000966	204	276	272	266	255
0.0220	0.001012	200	269	265	259	250
0.0230	0.001058	195	264	260	254	244
0.0240	0.001104	191	258	254	248	239
0.0250	0.001150	187	253	249	243	234
0.0260	0.001196	184	248	244	239	230
0.0270	0.001242	180	243	240	234	225
0.0280	0.001288	177	239	235	230	221
0.0290	0.001334	174	235	231	226	217
0.0300	0.001380	171	231	227	222	214
0.0310	0.001426	168	227	224	219	210
0.0320	0.001472	166	223	220	215	207
0.0330	0.001518	163	220	217	212	204
0.0340	0.001564	161	217	214	209	201
0.0350	0.001610	158	214	210	206	198
0.0360	0.001656	156	211	208	203	195
0.0370	0.001702	154	208	205	200	192
0.0380	0.001748	152	205	202	197	190
0.0390	0.001794	150	202	199	195	187
0.0400	0.001840	148	200	197	192	185
0.0410	0.001886	146	197	194	190	183
0.0420	0.001932	144	195	192	188	181
0.0430	0.001978	143	193	190	186	178
0.0440	0.002024	141	191	188	183	176
0.0450	0.002070	140	188	186	181	174
0.0460	0.002116	138	186	184	179	173
0.0470	0.002162	137	184	182	178	171
0.0480	0.002208	135	182	180	176	169
0.0490	0.002254	134	181	178	174	167
0.0500	0.002300	132	179	176	172	166
0.0510	0.002346	131	177	174	170	164
0.0520	0.002392	130	175	173	169	162

INDOOR RUBBER MOTORS *HHwally.wk1*

Approximate maximum turns (N)

SIZE .040 x size	PIRELLI WT/IN	PIRELLI TURNS/IN (N)	TAN II TURNS/IN 135A6x(N) FAI-8/93	TAN II TURNS/IN 133A6x(N) FAI-8/93	TAN II TURNS/IN 130A6x(N) FAI-8/93	TAN II TURNS/IN 125A6x(N) FAI-8/93
0.0960	0.004416	96	129	127	124	119
0.0970	0.004462	95	128	126	124	119
0.0980	0.004508	95	128	126	123	118
0.0990	0.004554	94	127	125	122	118
0.1000	0.004600	94	126	125	122	117
0.1010	0.004646	93	126	124	121	116
0.1020	0.004692	93	125	123	121	116
0.1030	0.004738	92	125	123	120	115
0.1040	0.004784	92	124	122	119	115
0.1050	0.004830	91	123	122	119	114
0.1060	0.004876	91	123	121	118	114
0.1070	0.004922	91	122	120	118	113
0.1080	0.004968	90	122	120	117	113
0.1090	0.005014	90	121	119	117	112
0.1100	0.005060	89	121	119	116	112
0.1110	0.005106	89	120	118	116	111
0.1120	0.005152	88	119	118	115	111
0.1130	0.005198	88	119	117	114	110
0.1140	0.005244	88	118	117	114	110
0.1150	0.005290	87	118	116	113	109
0.1160	0.005336	87	117	116	113	109
0.1170	0.005382	87	117	115	113	108
0.1180	0.005428	86	116	115	112	108
0.1190	0.005474	86	116	114	112	107
0.1200	0.005520	85	115	114	111	107
0.1210	0.005566	85	115	113	111	106
0.1220	0.005612	85	114	113	110	106
0.1230	0.005658	84	114	112	110	106
0.1240	0.005704	84	114	112	109	105
0.1250	0.005750	84	113	111	109	105
0.1260	0.005796	83	113	111	108	104
0.1270	0.005842	83	112	110	108	104
0.1280	0.005888	83	112	110	108	103
0.1290	0.005934	82	111	110	107	103
0.1300	0.005980	82	111	109	107	103
0.1310	0.006026	82	110	109	106	102
0.1320	0.006072	81	110	108	106	102
0.1330	0.006118	81	110	108	106	101
0.1340	0.006164	81	109	108	105	101
0.1350	0.006210	81	109	107	105	101
0.1360	0.006256	80	108	107	104	100
0.1370	0.006302	80	108	106	104	100
0.1380	0.006348	80	108	106	104	100

INDOOR RUBBER MOTORS *HHwally.wk1*

Approximate maximum turns (N)

SIZE .040 x size	PIRELLI WT/IN	PIRELLI TURNS/IN (N)	TAN II TURNS/IN 135A6x(N) FAI-8/93	TAN II TURNS/IN 133A6x(N) FAI-8/93	TAN II TURNS/IN 130A6x(N) FAI-8/93	TAN II TURNS/IN 125A6x(N) FAI-8/93
0.0530	0.002438	129	174	171	167	161
0.0540	0.002484	127	172	169	166	159
0.0550	0.002530	126	170	168	164	158
0.0560	0.002576	125	169	166	163	156
0.0570	0.002622	124	167	165	161	155
0.0580	0.002668	123	166	164	160	154
0.0590	0.002714	122	165	162	158	152
0.0600	0.002760	121	163	161	157	151
0.0610	0.002806	120	162	159	156	150
0.0620	0.002852	119	161	158	155	149
0.0630	0.002898	118	159	157	153	147
0.0640	0.002944	117	158	156	152	146
0.0650	0.002990	116	157	154	151	145
0.0660	0.003036	115	156	153	150	144
0.0670	0.003082	114	154	152	149	143
0.0680	0.003128	114	153	151	148	142
0.0690	0.003174	113	152	150	147	141
0.0700	0.003220	112	151	149	145	140
0.0710	0.003266	111	150	148	144	139
0.0720	0.003312	110	149	147	143	138
0.0730	0.003358	110	148	146	142	137
0.0740	0.003404	109	147	145	141	136
0.0750	0.003450	108	146	144	141	135
0.0760	0.003496	107	145	143	140	134
0.0770	0.003542	107	144	142	139	133
0.0780	0.003588	106	143	141	138	133
0.0790	0.003634	105	142	140	137	132
0.0800	0.003680	105	141	139	136	131
0.0810	0.003726	104	140	138	135	130
0.0820	0.003772	103	140	138	134	129
0.0830	0.003818	103	139	137	134	128
0.0840	0.003864	102	138	136	133	128
0.0850	0.003910	102	137	135	132	127
0.0860	0.003956	101	136	134	131	126
0.0870	0.004002	100	136	134	130	125
0.0880	0.004048	100	135	133	130	125
0.0890	0.004094	99	134	132	129	124
0.0900	0.004140	99	133	131	128	123
0.0910	0.004186	98	132	131	128	123
0.0920	0.004232	98	132	130	127	122
0.0930	0.004278	97	131	129	126	121
0.0940	0.004324	97	130	128	126	121
0.0950	0.004370	96	130	128	125	120

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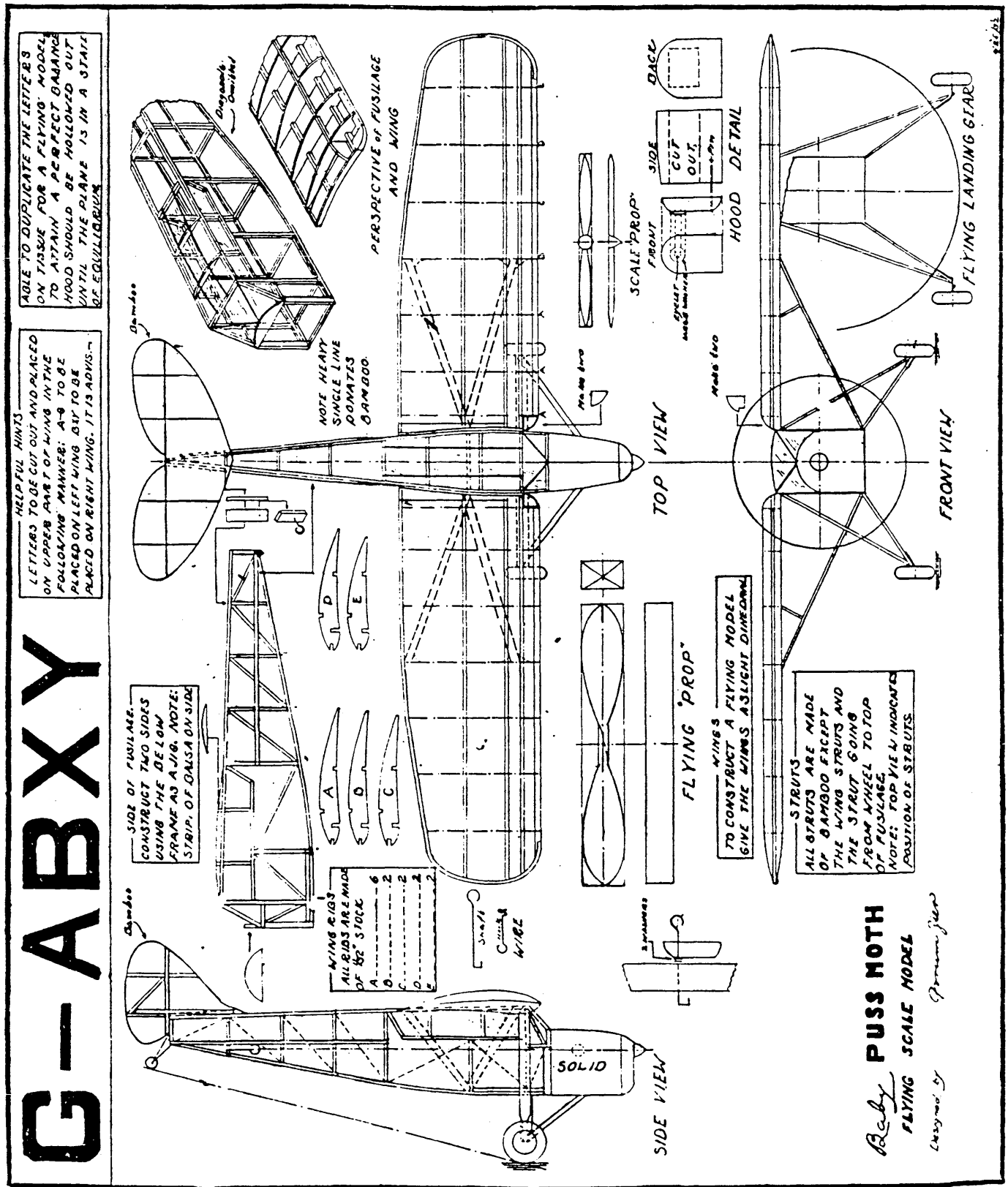
MAN. '36

DE HAVILLAND PUSS MOTH—Hearts Content

THE first westward solo flight was accomplished by Captain J. A. Mollison, a British flyer, in his De Havilland Puss Moth, "Hearts Content." Captain Mollison took off from Portmarnock Strand, Ireland, and landed at Pennfield Ridge, New Brunswick, Canada, August 19, completing the flight in 30 hours 12 minutes. This marks the shortest time from land to land on a westward crossing. Leaving Canada, Mollison set his wheels down on Roosevelt field, Long Island, New York, August 21.

The "Hearts Content" is powered with a Gypsy 3 inverted 4-cylinder air-cooled engine of 120 horsepower. The body of the Puss Moth is constructed of steel tubing, covered with fabric, the tail assembly consisting of a balanced rudder and an adjustable stabilizer. The tail wheel is of steerable type, and is controlled from the cabin.



ATTENTION EZB FLYERS!

JULY, 1995 - KIBBIE DOME, MOSCOW, IDAHO, U.S.A.

The groundwork is being laid for the first Wally Miller International EZB contest. This will be flown as a separate event in conjunction with the 1995 AMA Nationals and Andrew Taglifico's Kibbie Dome annual contest. U.S.A. EZB rules will apply. We are considering proxy flying for those overseas flyers who would not be able to attend personally.

A fee of $35.00 (U.S.) will be required to cover the cost of the dome rental and awards. Pre-registration will be required eight weeks in advance. Do not send any money now.

In order to have a successful contest, we need to know how many of you would be interested in such an event. Please contact one of the following with your response:

Andrew Taglifico
2860 Pack Saddle Drive
Portland, Oregon 97219
503-452-0546

Wally Miller
10039 SW Quail Post Road
Coeur D'Alene, Idaho 83814
208-772-4814

Larry Coslick
4202 Valley Crest Hills Drive
St. Louis, MO 63128
314-892-3803 (After 10:00 pm)
FAX: 314-296-4554

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* * * * * * * * *

IN MEMORY OF MANNY BADOFF

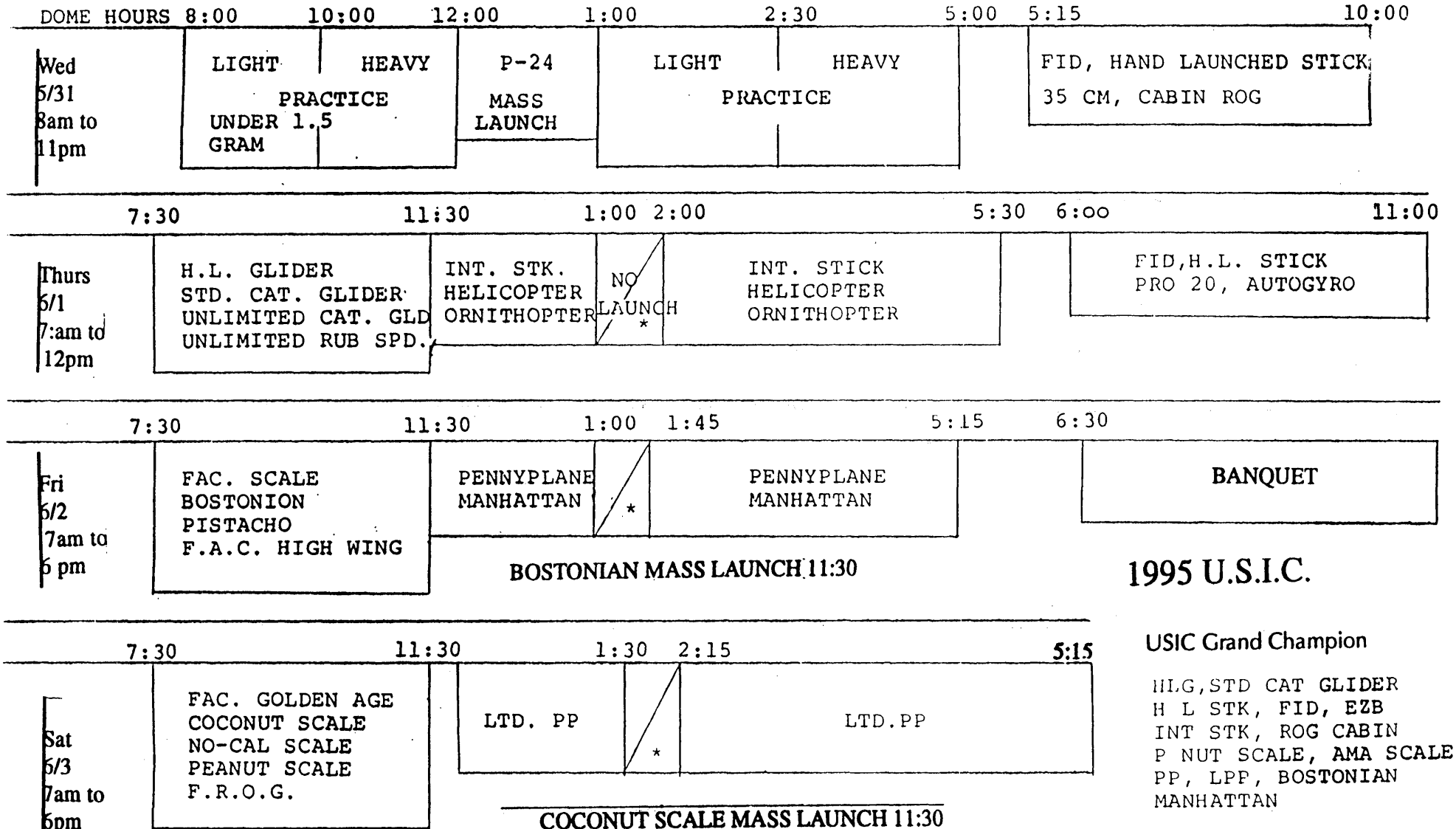
JUST A FEW THOUGHTS FROM
THE COMMITTEE ABOUT MANNY
BADOFF, WHO RECENTLY PASSED
AWAY. HIS TABLE WAS NEXT
TO OURS AT THE 1994 USIC.
ALTHOUGH HE WAS TOO TIRED
TO FLY HIS PLANES, HE ENJOYED
THOROUGHLY BEING A PART OF IT.
ROY AND LARRY FLEW HIS EZB IN
PROXY. HIS BEST TIME WAS 20.02
MINUTES. HE WAS SO DELIGHTED!
IT WAS A JOY TO WATCH HIM. WE
WILL ALL MISS HIM.
* * * * * * * * * *

FAX # 314-286-4554
Fax info to Larry Coslick

New Address

Gary Underwood
24 Kennebec Ct.
Bordentown, NJ. 08505
Tel. 609 324 9004
Fax. 609 324 9005

David Arostene
2405 Candlewood Dr.
Alexandria, Va. 22308
Tel. 703 360 3352



1995 U.S.I.C.

USIC Grand Champion

HLG,STD CAT GLIDER
H L STK, FID, EZB
INT STK, ROG CABIN
P NUT SCALE, AMA SCALE
PP, LPP, BOSTONIAN
MANHATTAN

SELECT ANY 7 EVENTS

NON-EXPERT SCALE EVENT

DESIGNED TO STIMULATE INTEREST IN SCALE FLYING. OPEN TO ANYONE WHO HAS NEVER WON A KANNONE. ANY TYPE RUBBER POWER SCALE MODEL CAN BE FLOWN ON ANY OF THE 3 DAYS OF SCALE FLYING.

INAV
Indoor News
and Views

1025 Cedar Street
Catawissa, MO 63015
314-271-2243

ISSUE #83

February, 1995

UPDATE OF THE 1995 USIC PLANS

In just a few short months, the 1995 USIC will be looking at us squarely in the face. We are ready for the big event to begin and it has been a great learning experience for us. We have all enjoyed working together. The combined effort of the contest management team made putting on this contest a real pleasure!

Roy White and Mary Jane Reilly will be making a trip to Johnson City in February to make arrangements for television and newspaper coverage of the contest. They will finalize contracts with venders and make the final arrangements for the banquet.

The real heros of the 1995 USIC are those that generously supported our cause. Without the financial support, it would not have been possible to bring you a four-day contest, with a full day for practice. This support also helped us to upgrade the quality of the awards.

After the last flight is down and all of the awards have been presented, the door will close on the 1995 USIC. Then it will be time for someone to volunteer to run the 1996 USIC. To facilitate the next director, we have streamlined the work of managing the USIC. We have compiled a list that will guide the director through the process of managing a contest of this magnitude. We have duplicate copies of all correspondence, contracts, score cards and score sheets. All of this will be turned over to the new director for the 1996 USIC. Please contact INAV if you are interested.

Roy White (INAV)
1025 Cedar Street
Catawissa, MO 63015
314-271-2243

FAX# 314-296-4554 (Larry Coslick)

1995 UNITED STATES INDOOR CHAMPIONSHIP PROGRAM

Every flyer who enters the contest will receive a Program. The contents will include:

- General information about the Johnson City site.
- Site records (so that you will know what times you have to beat!)
- Nostalgia plans
- Most of the winning designs from the 1994 USIC

This valuable program will be available to anyone who cannot attend the contest for $7.00. Shipping and handling for U.S. and Canada - $2.00. Overseas - $4.00. (Please allow 6-8 weeks for delivery.)

RUBBER MEASUREMENT BY WEIGHT

by Wally Miller

Most indoor modelers spend a great deal of time and effort selecting the proper wood, weighing every piece, keeping records and building as light as they dare. Then, at the flying site, quite often an eyeball evaluation of the power requirement is made and from a container that has the desired size marked on it, you remove a length of rubber. Well, I can almost guarantee that, if certified mechanically, the size will be in error.

A while back, I was stripping rubber for an upcoming contest. (I use both Harlan & Oppegard strippers.) After a pass on a 20' length, a check of the profile revealed that I had once again created a trapezoid, not extreme, but enough to raise my pressure a few points. Now I know this rubber is perfectly usable, but what size is it? After thinking about it considerably, I produced a formula for finding the average size of any profile configuration. With a slight deviation, it will enable the calculation of the weight of any known size to length.

The inconsistency of the rubber we use dictates that a "Base" must be established from a sample of the proposed length to be stripped. This is the key to our formula. Start by inspecting approx. 22' of rubber with a 10X scope. If all looks good,✂ cut it off 21' long, then remove some exact amount from each end. 6" seems right. Their combined lengths are the "L" of our formula. Weigh each piece and total it for "WT". Next, measure for "W" This is best done with a dial vernier caliper, set it to .253 (for 1/4 Stk) and let the jaws hang over the edge of your bench. Now, check all four ends of the sample, adjust the setting until the rubber just hangs on its own. With the above information, just follow the instructions on the left side of the chart and you will soon have a "Base" to suit your needs.

Now - Sizing rubber.

✂ From a strip, cut off a length as if to make up a motor

✍ Measure and record its length

✓ Weigh it to a 4-place decimal

☞ Follow the "Unknown Size" instructions on the right side of the chart.

✂ Cut the remainder of the 20' strip into usable lengths. Weigh, calculate and store it in marked containers.

While researching this project, 2 dozen 20' lengths were stripped. Each usable length within a strip was recorded for weight and size variation. From six to seven motors per strip, the average variation in weight was .0015 and .002 for size. Considering that both stock and cut size were simultaneously averaged, the results seem quite remarkable. Other batches may be different. Only time will tell.

In conjunction, and of equal importance, it was found that by reversing our formula, we are able to calculate the weight of any given size to length. This has been produced in a chart form as a "Visual Scale" for field use, and should prove to be a valuable tool for maximizing various flying conditions.

One final note:In Lew Gitlow's new book, on page 73, is a chart for the optimum motor weight as a percentage of the model weight. Combine the two charts and perhaps your watch will tick a little longer.

For a free chart, send a sase to

Wally Miller
2860 Packsaddle Dr.
Coeur d'Alene, ID 83814

RUBBER SIZE

LOOP LENGTH	.025	.028	.030	.032	.034	.036	.038	.040	.042	.044	.046	.048	.050	.052	.054	.056	.058	.060	.062	.064	.066	.068	.070	.072	.074	.076	.078	.080
6.0	.007	.008	.009	.009	.010	.010	.011	.012																				
6.5	.008	.008	.009	.010	.011	.011	.012	.012																				
7.0	.008	.010	.010	.011	.011	.012	.013	.013	.014																			
7.5	.009	.010	.011	.011	.012	.013	.014	.014	.015																			
8.0	.010	.011	.011	.012	.013	.014	.015	.015	.016	.017																		
8.5	.010	.011	.012	.013	.014	.015	.016	.016	.017	.018																		
9.0	.011	.012	.013	.014	.015	.016	.016	.017	.018	.019	.020																	
9.5	.011	.013	.014	.014	.016	.016	.017	.018	.019	.020	.021																	
10.0	.012	.013	.014	.015	.016	.017	.018	.019	.020	.021	.022	.023																
10.5	.013	.014	.015	.016	.017	.018	.019	.020	.021	.022	.023	.024																
11.0	.013	.015	.016	.017	.018	.019	.020	.021	.022	.023	.024	.025	.026															
11.5	.014	.015	.017	.018	.019	.020	.021	.022	.023	.024	.025	.026	.028															
12.0	.014	.016	.017	.018	.020	.021	.022	.023	.024	.025	.026	.028	.029	.030	.031	.032	.033	.035										
12.5	.015	.017	.018	.019	.020	.022	.023	.024	.025	.026	.028	.029	.030	.031	.032	.034	.035	.036	.037	.038	.040	.041						
13.0	.016	.017	.019	.020	.021	.022	.024	.025	.026	.027	.029	.030	.031	.032	.034	.035	.036	.037	.039	.040	.041	.042	.044					
13.5		.018	.019	.021	.022	.023	.025	.026	.027	.029	.030	.031	.032	.034	.035	.036	.038	.039	.040	.041	.043	.044	.045	.047	.048			
14.0			.020	.022	.023	.024	.026	.027	.028	.030	.031	.032	.034	.035	.036	.038	.039	.040	.042	.043	.044	.046	.047	.048	.050	.051	.052	.054
14.5					.023	.025	.026	.028	.029	.031	.032	.033	.035	.036	.038	.039	.040	.042	.043	.045	.046	.047	.049	.050	.052	.053	.054	.056
15.0						.026	.027	.029	.030	.032	.033	.035	.036	.037	.039	.040	.042	.043	.045	.046	.048	.049	.050	.052	.053	.055	.056	.058
15.5							.028	.030	.031	.033	.034	.036	.037	.039	.040	.042	.043	.045	.046	.048	.049	.051	.052	.054	.055	.057	.058	.060
16.0								.031	.032	.034	.035	.037	.038	.040	.041	.043	.045	.046	.048	.049	.051	.052	.054	.055	.057	.058	.060	.061
16.5									.033	.035	.036	.038	.040	.041	.043	.044	.046	.048	.049	.051	.052	.054	.055	.057	.059	.060	.062	.063
17.0										.036	.038	.039	.041	.042	.044	.046	.047	.049	.051	.052	.054	.055	.057	.059	.060	.062	.064	.065
17.5											.039	.040	.042	.044	.045	.047	.049	.050	.052	.054	.055	.057	.059	.060	.062	.064	.066	.067
18.0												.041	.043	.045	.047	.048	.050	.052	.054	.055	.057	.059	.060	.062	.064	.066	.067	.069

RUBBER SIZE

"VISUAL SCALE"

WEIGHT ROUNDED TO NEAREST .001

WALLY MILLER 1994

To FIND "BASE" OF ANY SAMPLE
WEIGHT & SIZE RUBBER

WT = WEIGHT
L = LENGTH $\frac{WT}{(LW)}$ = BASE
W = WIDTH
B = BASE

EXAMPLE THIS CHART

WT = .0729 (12.0 X .253 TAN II, 8/93 BATCH)
L = 12.0
W = .253

WT = $\frac{.0729}{3.0360}$ = .0240 BASE
LXW

TO ADD TO THIS CHART
(BLS) = WT

EXAMPLE, 14.0 LOOP/.048 SIZE

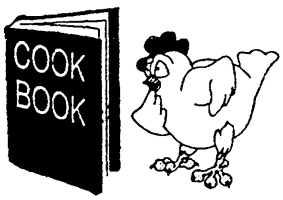
.0240 X 28.0 X .048 = .0322
(B) (L) (S) = (WT)

TO FIND UNKNOWN SIZE
(Have weight & length)

(WT/L/B) = S

EXAMPLE WT = .0310 LOOP = 14.0

.0310/28.0/.0240 = .0461
(WT) (L) (B) = (S)



SOME FOOD FOR THOUGHT ABOUT RUBBER

BY MOE WHITTEMORE

Mostly scientific, some subjective, that might be of interest to modelers.

- Losses due to friction among strands of a wound motor are negligible, as there is virtual equivalence between streched and wound motors. Lube, and forget friction!

- Approximately 1/3 of the energy you wind into the motor is lost to hysteresis during unwinding.

- Hystersis is due to:

  ✡ latent heat of crystallization.

  ✚ breaking of weak crosslinks.

  ✓ possible slippage among molecular chains.

- Reducing hystersis losses requires changes in manufacturing - including adjustments in the quantity of sulphur used in vulcanization. (Costs money!)

- Vulcanization reduces the tendency of rubber to crystallize.

- Vulcanization reduces the tendency of rubber to crystallize.

- An 8% sulphur/natural rubber vulcanized showed little, if any crystallization (2.6% is considered a .normal. production value). (How come we don't get any of this stuff?)

- The 'knee of the curve' marks the onset of crystallization; the extension ratio at this point is 5.72 in vulcanized rubber. (Since a ratio of 8.0 is a good rule of thumb marker for good contest rubber, we all crystallize.

- There is a time lag, which can be from seconds to hours between the application of stress and the appearance of a crystallization x-ray diffraction pattern. That's why wound motors occasionally blow up after launch!

- For extension ratios of less than three, the internal energy losses are negligible. (But, who winds this wimpy?)

- Processing with carbon black increases tensile strength and abrasion resistance. (Sounds like FAI black!)

- Softening agents (mineral oils, paraffin, etc.) Cause swelling of rubber. (Beware of castor oil!)

Now you know what I know!

From SAM86 Newsletter

Catapult Glider

By Dick Hardcastle

It would be much easier for me to write about something I know, like Pennyplane, EZB or Intermediate Stick than to explain my approach to Catapult Glider. Although I have had little experience in Catapult Glider, I did throw HLG in Category I sites years ago. As I recall, 32 feet up was max for me. When I learned it was legal to shoot a glider up with a rubber band, I was intrigued. I built a low/medium ceiling glider. I selected Chuck Markos' "Sub Sweep" from NFFS Digest, May 1988. Why I built this "V" wing glider, I'll never know. Even the designer says it won't fly as well as his polyhedral "High Roller." I built the glider for a 40' to 50' ceiling. It weighs 3.9 grams. I had planned to fly it on vacation at one of the MacDill AFB contests. Never did.

HLG and Catapult were well underway at the NATS site when I arrived, so I had ample time to see how others were flying. Gordon Wisniewski and Bud Tenny showed me their gliders and told me their planes would climb turning right and then glide left. Their gliders were heavier than mine. There was no way mine could get to the 79-foot catwalk, but determined to learn something about Catapult, I asked a lot of questions. Tenny cautioned me to proceed slowly and try to get the feel of the transition before launching to maximum height. Good advice!

The first thing to do with a glider is to make it glide. Right? I pointed the nose down slightly and gave it a gentle shove a few times and it was obvious this glider wanted to turn right. I looked at the right wing and noticed it had a little washin, so I decided to let it turn right. I would fly it as a low ceiling glider (right-right) because it was so light. After adding a little clay, the glide seemed seemed okay. Now, for the moment of truth . . . the launch.

I know this sounds strange, but as I pulled back the sandpaper ripper behind the stab, I thought:

✈"What's going to happen when I let this thing go?"

✈"Will the glider destroy itself by crashing into the 6-inch dowel I hold in my left hand?"

✈"What makes the glider fly past the catapult?"

After a moment of indecision, I let it go. It went up 25 feet at about a 75-degree angle, did a loop and attacked me from behind. I got out of its way. The glider was still in one piece, so I tried launching it at different angles and different banks without success. After thinking about it, I decided that I had too much incidence in the stab, hence the looping effect.

My fellow flyers in St. Louis kid me about my steamer. I take it to every contest. It works well to remove or add warps to my models. (It is really a Hot Steam Vaporizer, purchased years ago for the kids' room to help them breathe when they were sick.) So, it was off to the steamer to reduce the negative incidence in the stab. I wanted to get close to zero. I steamed the tail boom down and removed nose weight a little at a time. The results were astonishing. The glider started going

higher and higher with the same tension on the rubber band and the glider started to kick out at the top into a fairly good transition. With this approach, I kept bending the boom and reducing the nose weight until I went too far and gave the stab positive incidence. This sent the glider into an outside loop. It was a good thing I had a clay cushion on the nose, because the positive stab angle gave a hard dive into the concrete floor.

Flying with the wing/stab setting at zero, the glider at launch acts like an arrow or dart↗, knifing through the air without a trace of loop or roll. Better yet, it puts less pressure on the wings because the launch goes straight until the glider kicks out, very much like a low-ceiling glider at its peak. The launch angle is approximately 75 degrees ↗. 90 degrees is straight up ↕

Once, in an effort to improve the transition, I launched at a shallower angle. Big mistake! Ripped the lightweight wings right off the body. After gluing the wings back in place, I made sure I launched at 75 degrees or greater.

To gain consistency and to evaluate trim adjustments, each launch was made from a specific mark on the floor. I'm right-handed, so I pointed the tip of the catapult stick in my left hand at a distinctive light or beam in the roof structure, pulled the tail grip back and let her go. In retroro-spect, caution got the best of me. I didn't press the glider to its limits. A maximum altitude was approximately 50 feet with the best time of 51.6 seconds.

My next project will be to build Markos' "High Roller" and then try to get to John-son City early enough to fly it. Try Cata-pult sometime. It's quite a challenge. ✈

CHILTON'S CORNER
By Stan Chilton

MORE ON ADHESIVES:

In addition to the nitro cellulose based adhesives referred to in last month's column I use the following at one time or the other or for specific singular uses:

INSTANT (Cyanoacrylate) Use all the different viscosities plus accelerator. But I use the thinnest viscosity over 90% of the time. For application I put one drop on a non-absorptive surface (piece of aluminum or metal, glass or plastic) then dip a small insect mounting pin into this drop than apply this minuscule amount to the part to be cemented. I use the several different sizes of insect mounting pins and obtain them from almost any scientific or lab supply.

Never apply instant glue straight from the bottle. Gary Underwood has a technique for cementing motor tube and tail boom seams with instant glue dispensed via a super small plastic nozzle probably on the order of .005 inches inside diameter.

I asked him how he kept from cementing the motor tube or tail boom onto the metal forms and he replied he used so little cy-a on the seams that it didn't penetrate all the way to the form. I'm going to ask him to write up the details of his technique.

I use cy-a mainly for repairing spars and other broken parts while flying. I use cy-a during construction only to really strengthen the wire thrust bearing and rear hook areas. And also prop shaft to spar areas. Use of variable pitch props requires launch torque of about double that of conventional props, with very few turns backed off. One needs all the strength you can get in the motor stick.

Elmer's Water Based Contact Cement and 3M 75 Contact Cement: Both these cements are used only as adhesives for the plastic films such as Poly Micro II L.

Elmer's (use this brand only) is thinned with water about 6 to 10 parts water to one drop Elmer's. It is brushed lightly on the uncovered framework and then covered via your favorite method with the poly

micro. A burnishing tool is helpful to force and burnish the plastic covering to the framework. I used to use a ½ inch round wood burnishing tool I bought at an artist's supply but I've recently been using a metal burnishing tool that Dan Marek gave me. I think he got it at an artist's supply also.

By burnishing the poly micro down with firm strokes after trimming, less adhesive can be used.

To use the 3M 75 spray, lay the bare wood outline on a large sheet of newspaper and holding the 75 can about 4 feet above make one - just one sweep of spray across the outline below. Keep putting on less and less adhesive until it doesn't want to stick then back up a little. I've found it helps build my confidence if after spraying ever so lightly, I pick up the framework then run my hand across the newspaper. You'll find that there really has been enough adhesive applied to the framework by how much is oversprayed onto the newspaper. Do not use the 3M 75 to spray inside your work shop. I spray inside our double garage (autos out) with doors closed to keep out the wind.

I vacillate between the adhesives - it's just whatever is your favorite except the 3M 75 must be used to adhere the plastic film to boron outlines.

Titebond or Titebond II. Applied sparingly just like I do with cy-A, using a drop and an insect pin.

To be able to use acetone to loosen bracing wire anchor points on a microfilm wing, tail, etc., I cement small .016 inches square times height of the spar balsa brace wire anchors with the Titebond. I also cement the balsa wedges inserted into the spars after adding dihedral breaks with Titebond.

This then allows you to re-adjust wing wash at the contest if you have to. The acetone will soften the cellulose cement you've used to adhere the brace wires without dissolving the Titebond.

Applicators For The Cement: I make liberal use of the insect mounting pins as noted above, but they don't work as well on the cellulose based cements described in last month's article.

For these cements use one of two methods.

Method one is to use small brushes from 000 size up to #4. The O size brush works well on cementing motor tube and tail boom seams. I prefer sable brushes rather than the new synthetic bristles. Some modelers have mastered the technique of using a hypodermic syringe and needle to dispense cement to the seams but I feel I can get lighter results with the brushes. I use a brush and #3 cement to cement boron stringers on motor sticks and tail booms.

The second method is with a glue stick applicator. Some modelers use round toothpicks. I use a piece of ¼" square teflon by 6 inches long. One end is gradually tapered to an end about .010 x .030 inches. the other end is more sharply tapered to form sort of a screwdriver slot bit size of .085 x .025. This end is not used for cementing, but is used to more accurately position the part after it has been cemented.

The small end is used to cement wing ribs and other butt joints. A very small precise amount of cement may be applied using this small end. If cement builds up on this end merely remove it with your finger nail.

To grasp the teflon glue stick more easily I wrap masking tape around about 2 inches at the center. I then stick 4 pieces of the hook side of velcro on each of the 4 sides of the stick at the center. The velcro is cut into strips ⅛" x 2" for this application. I find a lot of uses for this hook side of velcro for handling smooth objects. I put it on my electric razor to keep from dropping it, and around cement bottle lids for easier removal.

I have some extra teflon ¼" square by 6 inch pieces I'll send anyone who requests. I had to buy a piece of teflon 12" square just to make 1 glue stick for myself.

KEEP RECORDS TO GET RECORDS

Many indoor modelers keep excellent flight records but I don't know how many keep construction records also. Both are important for one to keep improving construction and flight times.

Many years ago I made up a flight performance sheet to record the most critical points of each flight. The sheet is 8½ x 11 and is reproduced at the end of this article. Jim Richmond uses a flight record that is about 4" x 6", but he must write smaller than I do.

I have seen Dick Hardcastle talking into a tape recorder while winding and flying, later playing it back and reducing it to writing. Jim Clem keeps extremely detailed flight records sometimes having his wife Fran write down the details he dictates while flying.

Keeping complete records over a long period of time allows a flyer to go to a new site and be very close to motor size, turns, and torque on the first flight. Keeping flight records is an integral part of serious indoor flying.

Keeping construction records is every bit as important as flight records. Generally the better you build a model, the better it flies.

Some modelers weigh every rib, spar and every other tiny part of the model. I weigh only the finished parts and the wood that goes into making them.

For instance I will record the weight of the sheet of wood that I will make wing spars from. I'll note the density in pounds per cubic foot, the amount of flex and the thickness of the sheet. I'll then weigh each strip that is cut form this sheet.

I will not weigh the individual wing spars but I will record the weight of the strip from which they were made and the completed wing framework. The finished airframe components I weigh are motor stick, tail boom, stab, rudder, wing and prop.

Written construction records are extremely important when making the first of a design or even model to be flown. Build your prototype strong enough to fly. For the second model of the same design, try to cut all the wood sizes and weight 5%. Keep making successive models lighter until parts start breaking, then increase the wood sizes back up to where the part was satisfactory.

In order to weigh spars, sheets, and other component parts accurately your goal should be to acquire a balance or electronic scale that has a readability of .001 gram. But with a scale this sensitive, a plexiglas baffle or enclosure should be made to keep air movement from affecting its readability.

•

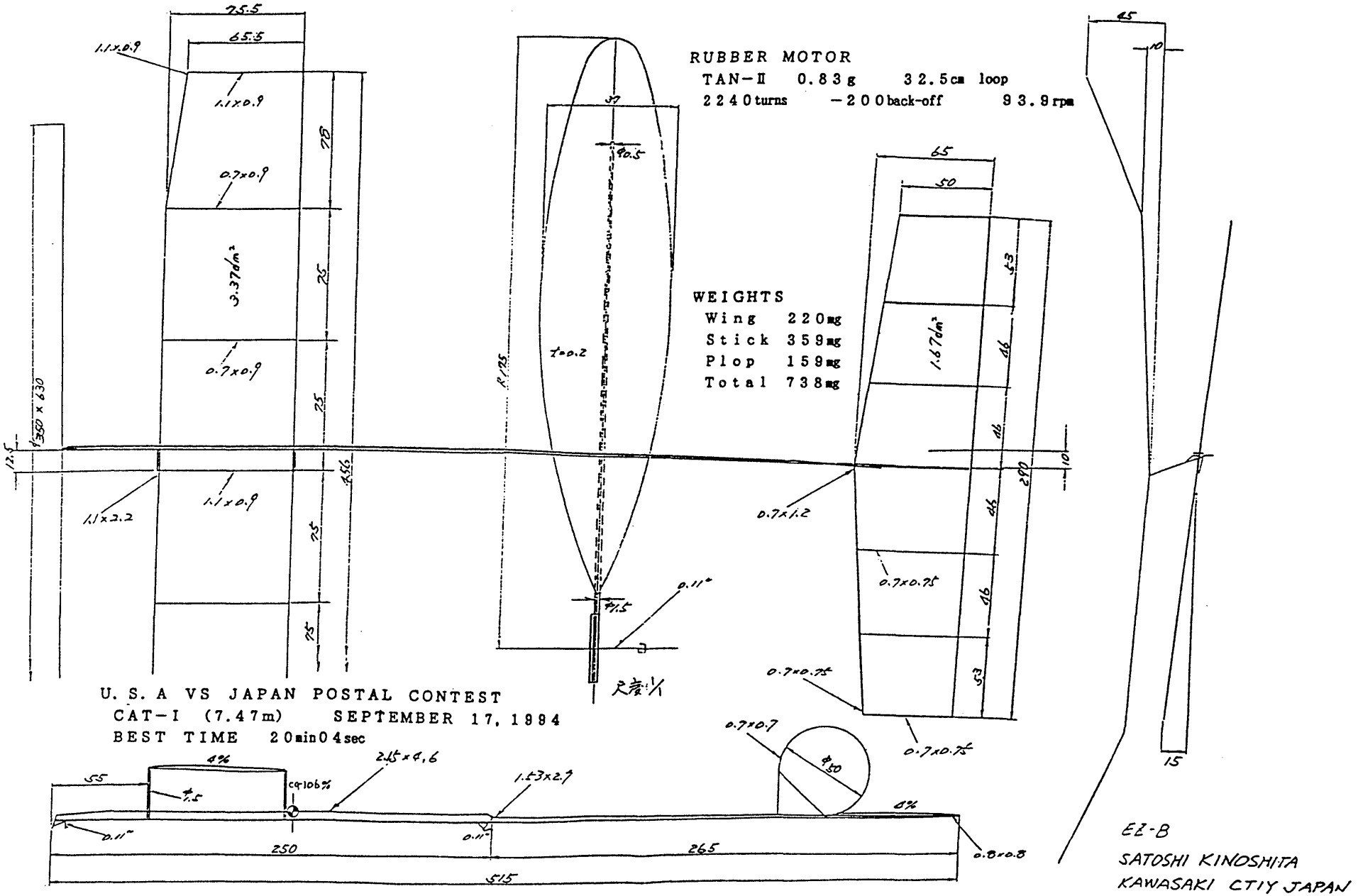
Stan Chilton's record time for Intermediate Stick is 40:45! It was incorrectly reported to us as 40:06. Quite a difference! We are very proud of you, Stan! ☆

CONGRATULATIONS!

ATTENTION

By Howard Henderson

Starting with this newsletter, we are abandoning the old confusing numbering system. This issue is called #83 (only). From now on, each issue will have only one number. Your label will now show your expiration date rather than a number. In this process of "change over", your poor struggling computer operator may have made a mistake. If you think so, drop us a card and we will take your word for any errors. We trust you.


RUBBER MOTOR
TAN-II 0.83g 32.5cm loop
2240turns -200back-off 93.9rps
WEIGHTS
Wing 220mg
Stick 359mg
Plop 159mg
Total 738mg
U. S. A VS JAPAN POSTAL CONTEST
CAT-I (7.47m) SEPTEMBER 17, 1994
BEST TIME 20min04sec
EZ-B
SATOSHI KINOSHITA
KAWASAKI CTIY JAPAN
三面図 尺度 1/1

1994 EZ—B USA Rules

日米対抗通信競技チーム成績

JAPAN-U.S.A POSTAL CONTEST team Standing

1	川崎Aチーム KAWASAKI-A-team			
	木下 哲 KINOSHITA	間崎 隆次 MAZAKI	三沢 正敏 MISAWA	Total 合計
	20' 04"	17' 11"	14' 42"	51' 57"
2	West Coast Flyers			
	Bob De Shielde	Bob Gibbs	Steve Brown	合計
	16' 10"	15' 36"	15' 13"	46' 59"
3	Greet Plains/Southwest			
	Stan Chilton	Bud Tenny	Jim Clem	合計
	16' 31"	13' 04"	12' 29"	42' 04"
4	Goddard Flyers			
	Dan Belicff	Tom Vallee	Ray Weisman	合計
	15' 49"	15' 02"	10' 57"	41' 48"
5	St, Louis Flyers			
	Dick Hardcastle	Larry Cosllck	Bill Martin	合計
	14' 42"	12' 56"	12' 10"	39' 48"
6	東京チーム TOKYO-team			
	野中 繁吉 NONAKA	小俣 昇 OHMATA	山梨 雅弘 YAMANASHI	合計
	16' 42"	14' 11"	08' 50"	39' 43"
7	Cleveland Clowns			
	Larry Loncka	Larry Mzik	Vernon Hacker	合計
	14' 23"	13' 40"	08' 42"	36' 45"
8	川崎Bチーム KAWASAKI-B-team			
	金子 昌司 KANEKO	田中 泰孝 TANAKA	小村 和正 KOMURA	合計
	12' 26"	12' 09"	10' 04"	34' 39"

9 東京新宿クループ SHINJUKU-group

原 一馬 HARA	田村 久雄 TAMURA	栗原 弘 KURIHARA	合計
12' 20"	11' 03"	10' 47"	34' 10"

10 Brainbusters A

Dave Robelen	Abram Van Dover	John Diebolt	合計
11' 49"	09' 59"	09' 42"	31' 30"

11 川崎麻生グループ ASOH-group

玉井 清造 TAMAI	富田 定佳 TOMITA	池田 洋一 IKEDA	合計
10' 54"	09' 28"	09' 19"	29' 41"

12 江戸川グループ EDGAWA-group

林 修 HAYASHI	寺尾 孝 TERAO	藤原 瑞吉 FUZIWARA	合計
09' 45"	09' 06"	10' 43"	29' 34"

13 Memphis Indoor Modelalrs

Mark Vancil	Jim Lynch	Jon Vancil	合計
11' 38"	07' 39"	05' 38"	24' 55"

14 いわきグループ IWAKI-group

柴田 進 SHIBATA	小池 広 KOIKE	鈴木 利一 SUZUKI	合計
08' 22"	07' 57"	07' 28"	23' 47"

15 Brainbusters B

Bob Platt	Walt Coilins	Paul Robelen	合計
11' 49"	08' 24"	02' 30"	22' 43"

16 Oakland Cloud Dusters

Mike Pairang	Herb Robbins	Stu Bennett	合計
09' 58"	06' 18"	06' 01"	22' 17"

1994 EZ—B USA Rules

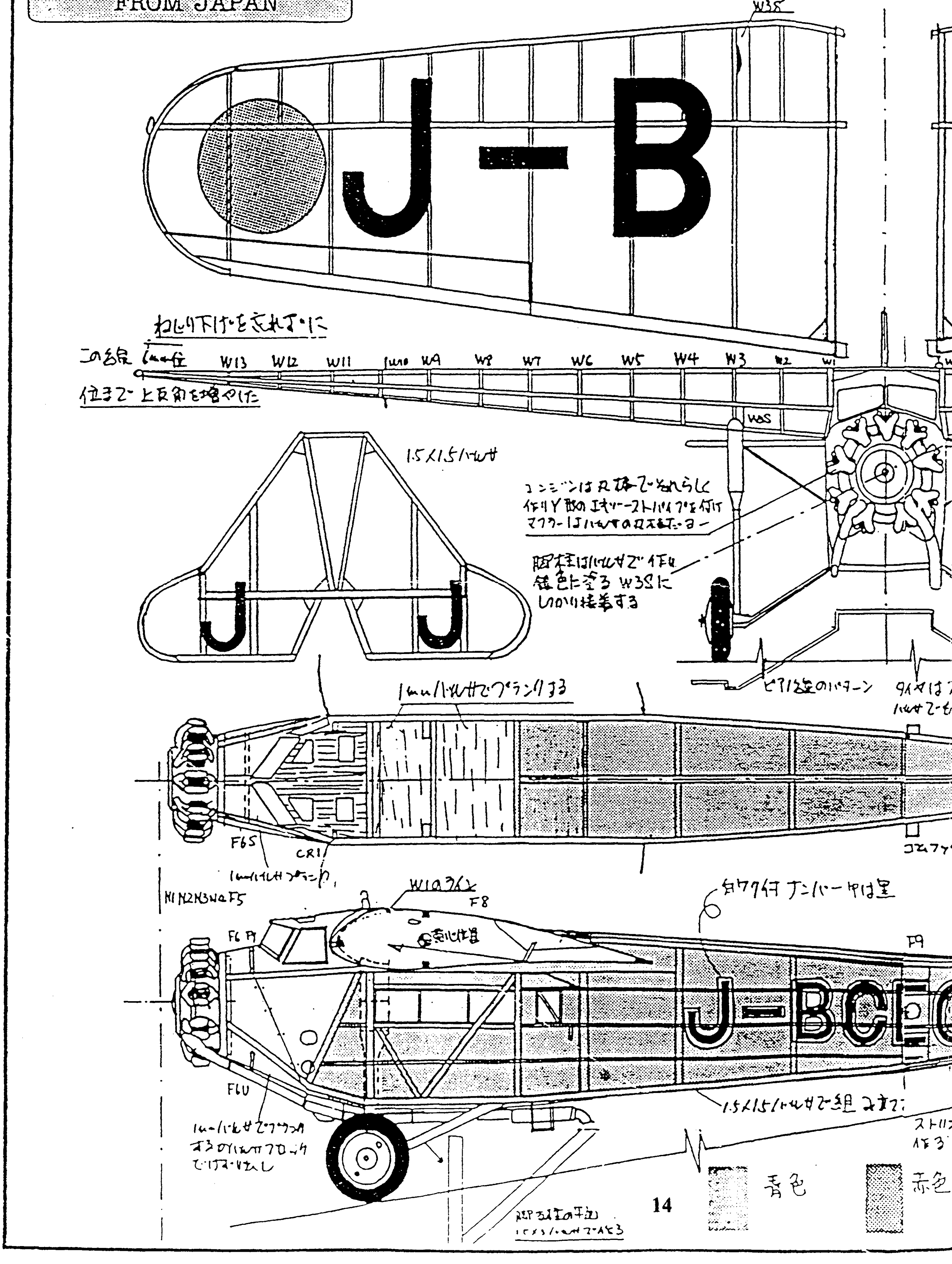
日米対抗通信競技個人成績

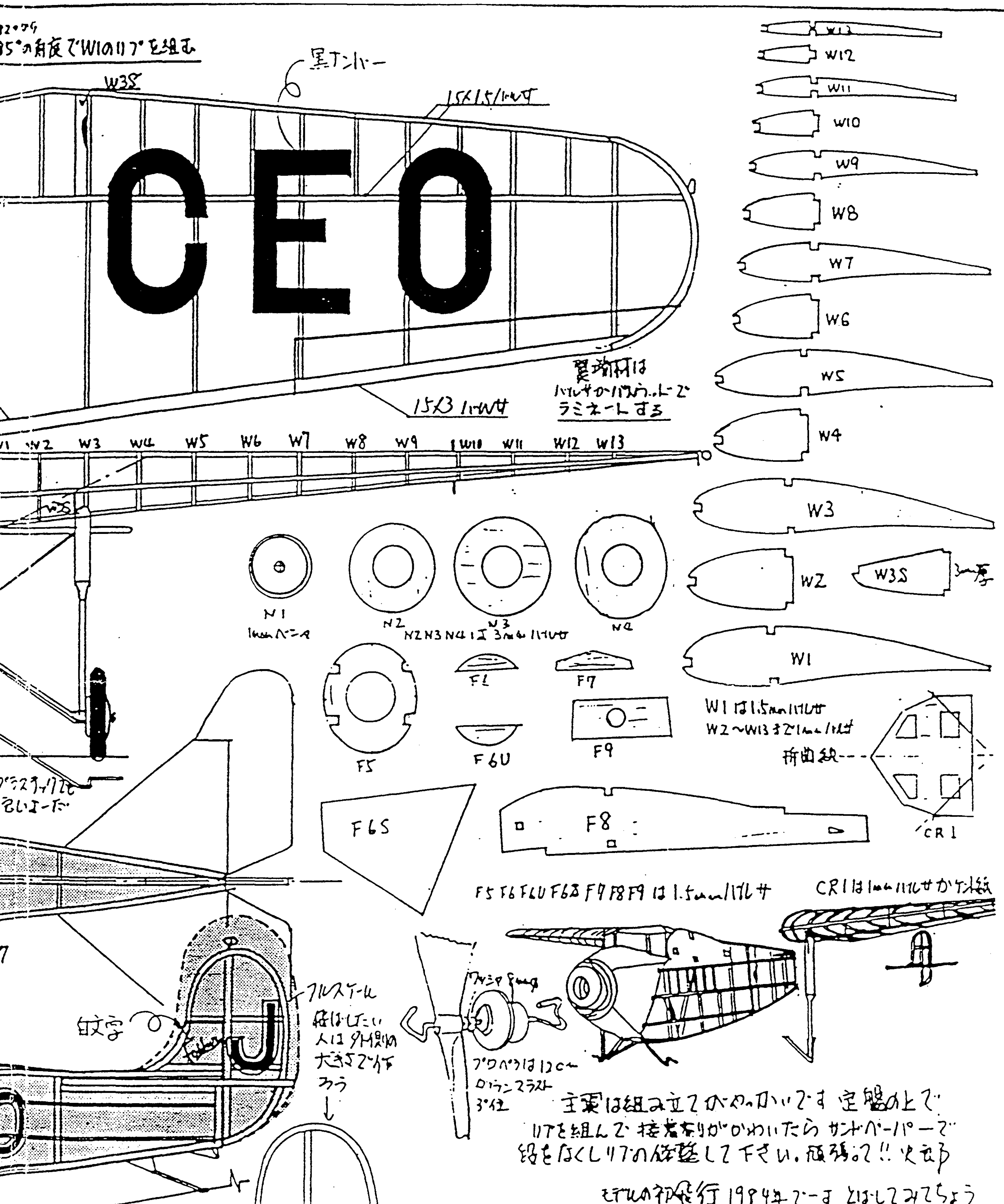
JAPAN× U.S.A. POSTAL CONTEST individual standing

1	木下 哲 KINOSHITA	20' 04"	25	田村 久雄 TAMURA	11' 03"
2	間崎 隆次 MAZAKI	17' 11"	26	Ray Weisman	10' 57"
3	野中 繁吉 NONAKA	16' 42"	27	玉井 清造 TAMAI	10' 54"
4	Stan Chilton	16' 31"	28	栗原 弘 KURIHARA	10' 47"
5	Bob De Shields	16' 10"	29	藤原 瑞吉 FUZIWARA	10' 43"
6	Dan Belieff	15' 49"	30	小村 和正 KOMURA	10' 04"
7	Bob Gibbs	15' 36"	31	Abran Van Dover	9' 59"
8	Steve Brown	15' 13"	32	Mike Pairang	9' 58"
9	Tom Vallee	15' 02"	33	林 修 HAYASHI	9' 45"
10	Diek Hardcastle	14' 42"	34	John Diebolt	9' 42"
11	三沢 正敏 MISAWA	14' 42"	35	富田 定佳 TOMITA	9' 28"
12	Larry Loncka	14' 23"	36	池田 洋一 IKEDA	9' 19"
13	小俣 昇 OHMATA	14' 11"	37	寺尾 孝 TERAO	9' 06"
14	Larry Mzik	13' 40"	38	山梨 雅弘 YAMANASHI	8' 54"
15	Bud Tenny	13' 04"	39	Vernon Hacker	8' 42"
16	Larry Cosllck	12' 56"	40	Walt Collins	8' 24"
17	Jim Clem	12' 29"	41	柴田 進 SHIBATA	8' 22"
18	金子 昌司 KANEKO	12' 26"	42	小池 広 KOIKE	7' 57"
19	原 一馬 HARA	12' 20"	43	Jim Lynch	7' 39"
20	Bill Martin	12' 10"	44	鈴木 利一 SUZUKI	7' 28"
21	田中 泰孝 TANAKA	12' 09"	45	Herb Robbins	6' 18"
22	Dave Robelen	11' 49"	46	Stu Bennett	6' 01"
23	Bob Plott	11' 49"	47	Jon Vancil	5' 38"
24	Mark Vancil	11' 38"	48	Paul Robelen	2' 30"

PEANUT PLAN
FROM JAPAN

Designed & Drawn by Shoichi Uchida





中島FOKKER.SUPER.UNIVERSAL旅客輸送機

昭和6年頃に初飛行 色は銀と青 日の丸は赤ナンバーは黒サイド

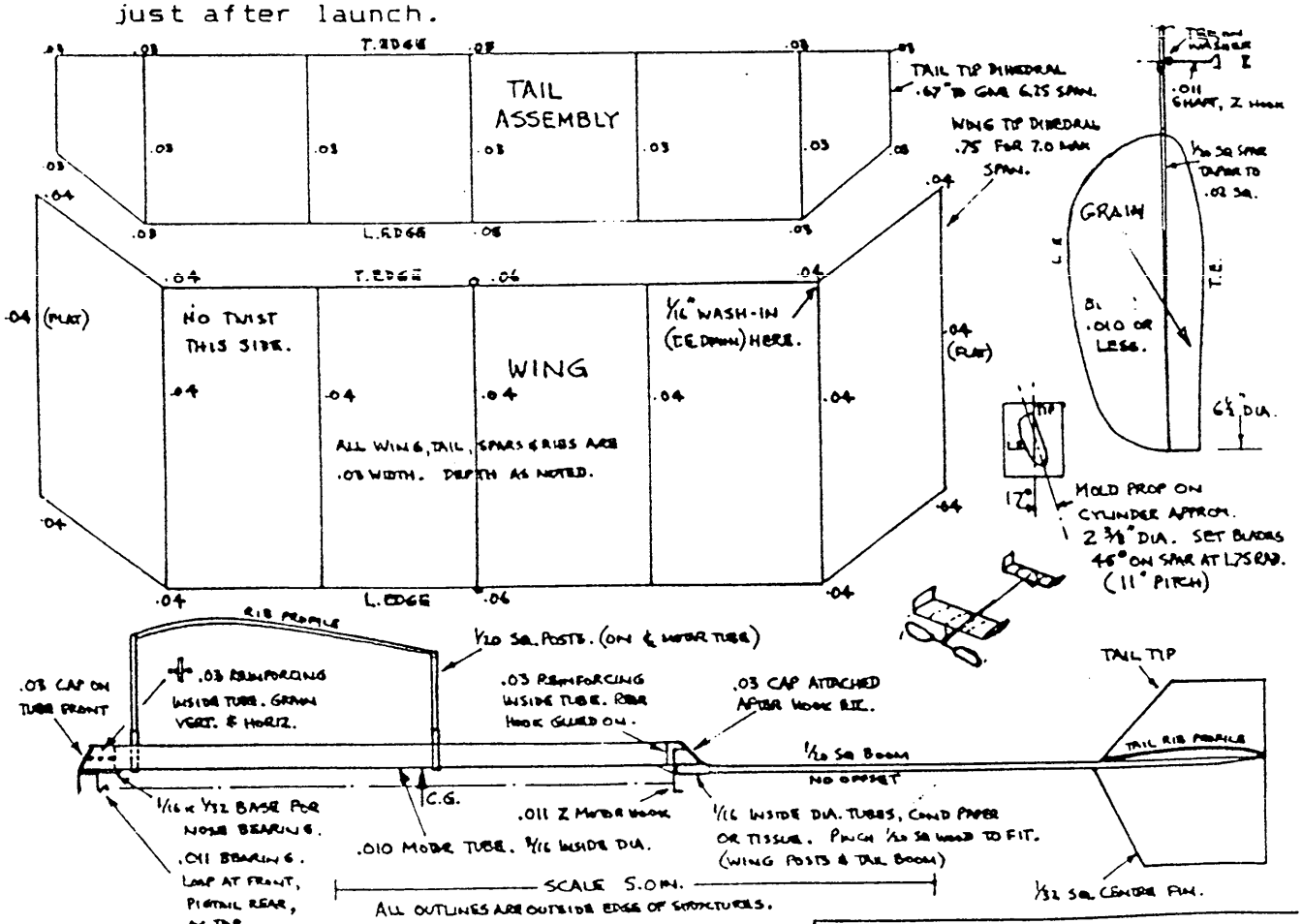
のナンバーは白ワク付 | ピーナッツスケール | 1988.9月 | 竹内史郎

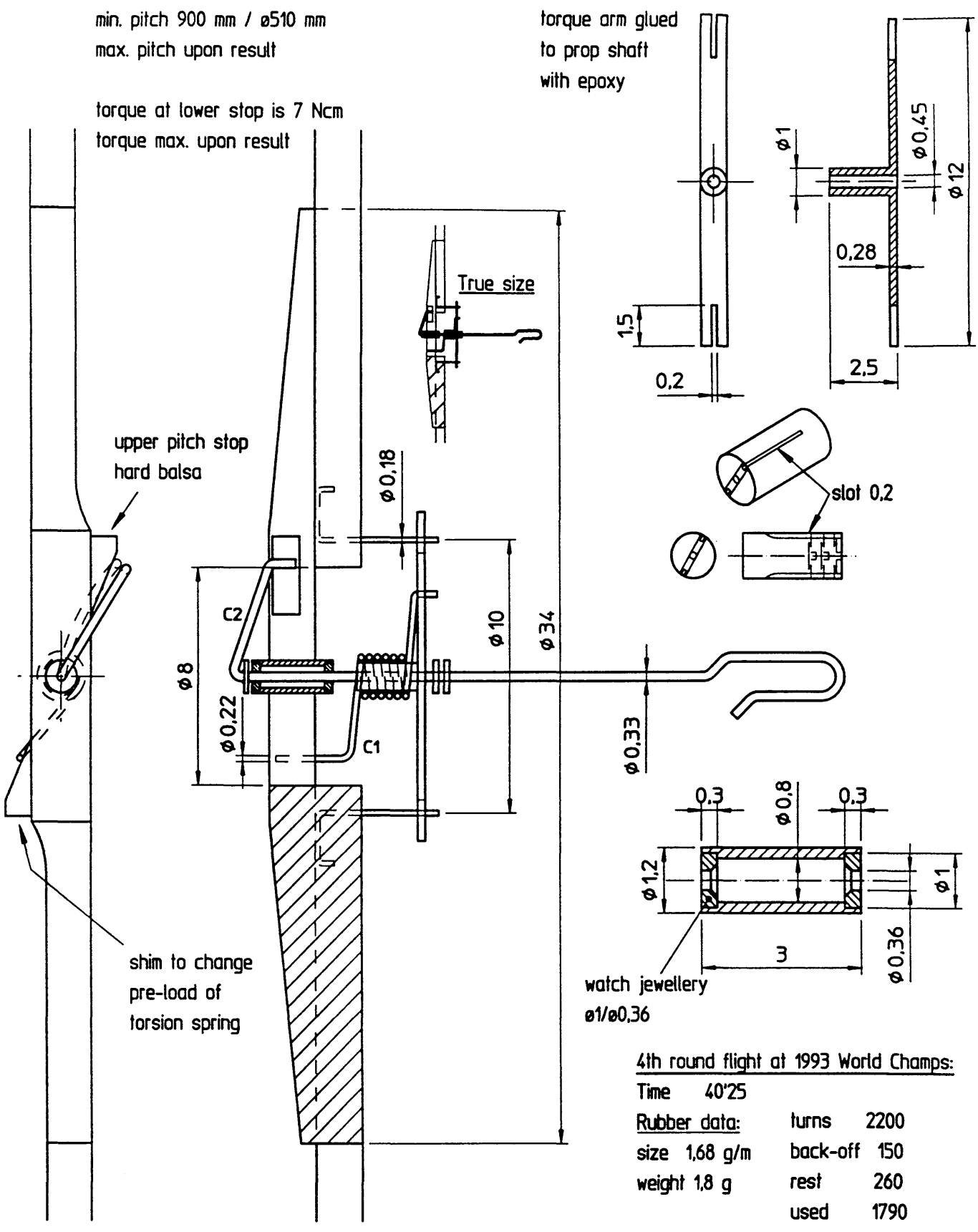
Tiddly-Winks 2 was developed from no. 1. Principal changes are:

- -new wing section
- -simplified wingtip shape
- -underfin added to improve turning under full power
- -tubular stick to minimize trim changes due to stick twist as torque varies
- -new prop copied from Wayne Trivin

Of all the changes it appears that the tubular stick is the most beneficial. At the MIAMA contest at McDill AFB on Feb. 12/13 on the second contest flight, it climbed to within two or three feet of the roof, lightly hit a couple of obstructions, and did a long, slow descent for a time of 8:14 to win the Mini-Stick event.

Flying in the McDill hangar is a challenge. Lamps hang down fifteen to twenty feet from the roof like a forest. Close to the roof is an array of beams and supporting rods. To avoid the lamps, trim for a smallish circle and try to launch into a gap between them. To get a long flight without getting hung in the roof clutter requires a simple winding tehnique. A torque meter must be used. First, put in a lot of turns, then back off a few-usually one, two, or three turns on the winder. This will drop the torque quite a lot and kill that fast climb to the roof where death and destruction await! However, there are still a lot of power turns left which will give a long slow climb. This requires experimenting with turns and back-off until the model is just in danger of hitting the roof junk for a maximum flight time. This approach also aids trimming for that high torque time just after launch.

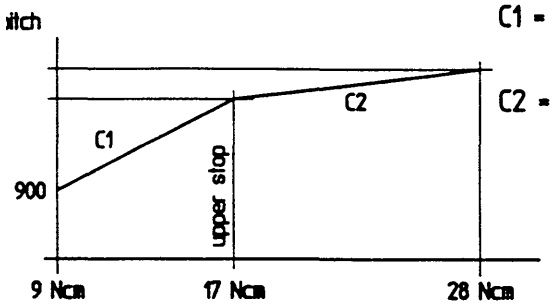




4th round flight at 1993 World Champs:

Time	40'25	
Rubber data:	turns	2200
size 1,68 g/m	back-off	150
weight 1,8 g	rest	260
	used	1790
	RPM	44,3/min.

Weight of prop: 0,19 g



C1 = stiffness constant of torsion spring

C2 = stiffness constant of torsion part of prop shaft

F1D Variable Pitch Prop

by René Butty (SWI)
F1D European Champion 1993

FORTY MINUTE CLUB

January 1, 1995

NAME	COUNTRY	TIME	1*	2*	YEAR	SITE
RANDOLPH, BOB	USA	55:06	X		1993	SANTA ANA
ASLETT, BERNARD	ENGLAND	52:22	X		1983	CARDINGTON
RICHMOND, JIM	USA	52:14	X		1979	AKRON
KOWALSKI, DICK	USA	50:41	X		1976	AKRON
ROMAK, BUD	USA	49:35		X	1991	LAKEHURST
BANKS, CEZAR	USA	49:00		X	1991	LAKEHURST
BROWN, STEVE	USA	48:37		X	1993	AKRON
RICHMOND, JIM	USA	47:44		X	1986	CARDINGTON
BARR, LAURIE	ENGLAND	47:28		X	1982	CARDINGTON
HARLAN, RAY	USA	47:13		X	1980	AKRON
DOIG, RICHARD	USA	46:24	X		1983	AKRON
CHILTON, STAN	USA	46:10		X	1994	AKRON
RODEMSKY, ERV	USA	45:50	X		1974	SANTA ANA
RIEKE, K. H.	W. GERMANY	45:40	X		1962	CARDINGTON
HUNT, BERNARD	ENGLAND	45:40		X	1992	CARDINGTON
RANDOLPH, BOB	USA	45:35		X	1993	AKRON
REDLIN, CARL	USA	45:17	X		1962	CARDINGTON
ANDREWS, PETE	USA	44:59		X	1979	AKRON
MATHER, CLARENCE	USA	44:44	X		1974	SANTA ANA
BUTTY, RENE	SWITZERLAND	44:44		X	1990	LAKEHURST
ASLETT, BERNARD	ENGLAND	44:37		X	1985	CARDINGTON
HULBERT, BILL	USA	44:27		X	1994	AKRON
HACKLINGER, MAX	W. GERMANY	44:20	X		1961	CARDINGTON
DOIG, RICHARD	USA	44:06		X	1991	LAKEHURST
NORE, PENTTI	FINLAND	44:01		X	1986	CARDINGTON
ANDRE, THEDO	NETHERLANDS	44:01		X	1986	CARDINGTON
GIBBS, BOB	USA	43:43		X	1993	AKRON
KOPECKY, ERNIE	USA	43:42	X		1963	SANTA ANA
ORSOVAI, DEZSO	HUNGARY	43:37		X	1986	CARDINGTON
KUJAWA, SYLWESTER	POLAND	43:35		X	1992	WROCLAW
CUMMINGS, FRANK	USA	43:28	X		1963	SANTA ANA
REE, ANDRAS	HUNGARY	43:27		X	1992	DEBRECEN
ATWOOD, BILL	USA	43:17	X		1963	SANTA ANA
PLOTZKE, RON	USA	42:53	X		1969	LAKEHURST
UNDERWOOD, GARY	USA	42:53		X	1994	LAKEHURST
FOSTER, JOE	USA	42:44		X	1987	SANTA ANA
DE BATTY, BOB	USA	42:42		X	1994	SANTA ANA
LOUCKA, LARRY	USA	42:34		X	1991	AKRON
SIEBENMANN, DIETER	SWITZERLAND	42:33		X	1986	CARDINGTON
CAILLIAU, LARRY	USA	42:29		X	1985	AKRON
DOMINA, DAN	USA	42:25		X	1979	AKRON
CANNIZZO, SAL	USA	42:20		X	1983	LAKEHURST
PYMM, DAVE	ENGLAND	42:03		X	1986	CARDINGTON
ROMAK, BUD	USA	42:01	X		1965	MOFFETT NAS
OBARSKI, DICK	USA	41:30		X	1981	AKRON
FINCH, TOM	USA	41:27	X		1963	SANTA ANA
SLUSARCZYK, DON	USA	41:25		X	1990	AKRON
CHAMPINE, BOB	USA	41:23	X		1963	SANTA ANA
RODEMSKY, ERV	USA	41:23		X	1979	AKRON
STOLL, ED	USA	41:21	X		1963	SANTA ANA
MANGALEA, CORNELIU	ROMANIA	41:15		X	1994	SLANIC-PRAHOVA
HOFFMAN, EARL	USA	41:13		X	1987	SANTA ANA
MATHER, CLARENCE	USA	40:54		X	1974	SANTA ANA
DRAPER, RON	ENGLAND	40:44	X		1962	CARDINGTON
BILGRI, JOE	USA	40:37	X		1965	SANTA ANA
NONAKA, S.	JAPAN	40:36		X	1978	CARDINGTON
STEVENS, DARRYL	USA	40:35		X	1986	SANTA ANA
BAILEY, BOB	ENGLAND	40:25		X	1987	CARDINGTON
POPA, AUREL	ROMANIA	40:21		X	1994	SLANIC-PRAHOVA
GITLOW, LEW	USA	40:15		X	1987	SANTA ANA
MCGILLIVRAY, JACK	CANADA	40:14		X	1988	JOHNSON CITY
KALINA, JIRI	CZECH	40:11		X	1975	CARDINGTON
RODENBURG, OTTO	NETHERLANDS	40:11		X	1986	CARDINGTON
TRIOLO, JOHN	USA	40:06	X		1974	LAKEHURST

* CLASS 1 – Over 65 cm
CLASS 2 – FAI 65 cm – 1 gram

Official and unofficial flights included (best effort only, by individual, by class is shown)

For additions, corrections, etc. send details to: BOB GIBBS 22870 Springmist Drive, Moreno Valley, CA 92557 USA

403 Mossy Lea Road,
Wrightington,
Phone 0257 452624 Wigan, Lancs..
England. WN6 9SB

Dear Club Secretary or Contact / Magazine Editor,
and Indoor Flyer.

Once again the British Model Flying association, Indoor Technical Committee would like to invite your members / readers to take part in "THE 1995 LIVING ROOM STICK / MINI STICK INTERNATIONAL INDOOR POSTAL CONTEST", to be run over this winter period. Can you please pass on / publish this contest for your members / readership. This will the 5th year that I have run this event and due to extra work this will be the LAST TIME, if any one wants to take it over please let me know.

The rules for this contest will be as follows :-

1. The contest is open to Indoor models which comply with Living Room Stick / Mini Stick Rules, (the spec. is the same as last year).
2. Contest flights are to be made between 1st Jan 1995 and 31st March 1995.
3. Any number of flights can be made at any number of sites.
4. All contest flights to be timed by someone other than the flyer.
5. All contest flights to be recorded on an official Results Form, available from the above address, (please send SSAE etc. you can make extra copies).
6. Best single flight time wins, after the flight time has been corrected for the different ceiling heights. Ceiling height to be measured as per F.A.I. but with a 5 meter diameter circle. The correction factor is 627 divided by (167 plus 46 times the square root of the ceiling height in feet). The time in seconds will be multiplied by this to give the corrected time.
7. Prizes will be awarded dependent on the number of contestants.
8. All Results Forms to be returned to the above address no later than 10 April 1995.
9. Entry if FREE to ALL contestants (A club sticker sent to the organiser would be appreciated)
10. Results will be sent if a SSAE is included with the Results Forms.

'LIVING ROOM STICK/MINI STICK' Model Rules

Model

Monoplane, Max. Span (projected)	7.0 inches
Max. Wing Chord	2.5 inches
Stick Length	5.0 inches
Max. Model length (less prop)	10.0 inches
Stab (Tail) area	Max. = 50 per cent of wing
Covering	Plastic / Paper. NO Microfilm
Propeller	Wood prop 7" Diameter max.
Minimum weight	0.43 gms.) 0.015 ounces

NO V.P. or V.D. Props or 'Torque Burners' are to used (keep it low tech.)

Flying

Steering	4 ten second steers *
Attempt	Fifteen seconds or more *

* Special flying rules for very small rooms only ! (Living room flying only)

GOOD FLYING & HAVE FUN

Mike Colling.

Mike Colling
BMFA Indoor Technical Committee Chairman.

THE LAST GREAT LIVING ROOM STICK POSTAL CONTEST RESULTS FORM

Name of Club _____

Contest Held on (Date) ___/___/___

At (Site name) _____ Ceiling Height_____Ft

Contestants name	Contestants Address	Flight Time (seconds)	Timekeeper (inits)	Leave Bank
		1.		
		2.		
		3.		
SMAE No.		4.		
		5.		
Age if Jnr		6.		
		1.		
		2.		
		3.		
SMAE No.		4.		
		5		
Age if Jnr		6		
		1		
		2.		
		3.		
SMAE No.		4.		
		5.		
Age if Jnr		6.		
		1.		
		2.		
		3.		
SMAE No.		4.		
		5.		
Age if Jnr		6		

WALLY MILLER INTERNATIONAL EZB CONTEST

JULY 14, 1995 FRIDAY - 9am to 5pm KIBBIE DOME MOSCOW, IDAHO
Contest will precede the 1995 AMA Nationals

ENTRY FEE $35

This fee is based on the exclusive use of the Kibbie Dome for this very special event.
No other model, other than EZB will be allowed to fly.
Please make checks payable to EZB International and mail to Larry Coslick

TROPHIES WILL BE AWARDED TO THIRD PLACE

RULES:

1. **The best two of six flights will win. Six rounds will be flown at one hour intervals, with ½ hour between rounds.**
2. **The start time will be 9 a.m. The last round will start at 4:30 p.m..**
3. **The official flight time will be one minute. Two attempts will be allowed to make one official flight.**
4. **Three official flights (of at least 15 minutes) must be made to qualify for the championship.**
5. **The AMA rules on model only. Contestants may process three models.**

CONTEST SPONSORS

Larry Coslick
4202 Valley Crest Hills
St. Louis, Mo 63128
314-892-3803 (After 10:00 P.M.)
FAX # 314-296-4554

Wally Miller
10039 Sw Quail Post Road
Coeur D'alene, Idaho 83814
208-772-4814

Everyone WELCOME
MAKE PLANS NOW TO FLY WITH US!

	8:00 A.M	10:00	12:00	2:00	4:00	6:00	8:00 P.M.	
SATURDAY JULY 15, 1995 * F1D CONTESTANTS MEETING	ARRIVAL & SET-UP		HLG		F1D, ROG CABIN &			EAST
		STD. CATAPULT GLIDER			AMA STICK PRACTICE			CENTER
		UNL. CATAPULT GLIDER			AMA & TEAM F1D*	TEAM SELECTION F1D PRACTICE		WEST
SUNDAY JULY 16, 1995		FLYING SCALE			MANHATTAN			EAST
		& PEANUT SCALE			ROG CABIN & AMA STICK			CENTER
		EVENTS			F1D TEAM PRACTICE	SELECTION RND. 1	RND. 2	WEST
MONDAY JULY 17, 1995		SCALE	BOSTONIAN			ORNITHOPTER, AUTOGIRO & EXP. AUTOGIRO		EAST
		EVENTS				ROG STICK		CENTER
		NOVICE PENNYPLANE			F1D TEAM PRACTICE	SELECTION RND. 3	RND. 4	WEST
TUESDAY JULY 18, 1995		PENNYPLANE				~~EZ F1D~~		EAST
		INTERMEDIATE STICK						CENTER
		F1D			F1D TEAM PRACTICE	SELECTION RND. 5	RND 6	WEST

FOURTEENTH UNITED STATES INDOOR CHAMPIONSHIPS
MAY 31, & JUNE 1, 2, 3, 4, 1995
"MINI-DOME" - East Tennessee State University, Johnson City, Tennessee

Sponsored by National Free Flight Society

Send Entry Payable To:
USIC, 444 BRYAN, ST. LOUIS, MO 63122

DOME HOURS	7	8	9	10	11	12	1	2	3	4	5	6	7	8	9	10	11
WEDNESDAY MAY 31 8:00 A.M. TO 11:00 P.M.		LIGHT / HEAVY PRACTICE UNDER 1.5 GRAM				P-24 MASS LAUNCH		LIGHT	HEAVY PRACTICE			F1D, HAND LAUNCHED STICK 35 CM, CABIN ROG					
THURSDAY JUNE 1 7:00 A.M. TO 12:00 P.M.		H.L. GLIDER STD. CAT. GLIDER UNLIMITED CAT. GLD. UNLIMITED RUB. SPD.				INT. STK. HELICOPTER ORNITHOPTER		NO LAUNCH ★	INT. STICK HELICOPTER ORNITHOPTER				F1D, HAND LAUNCHED STICK PRO 20, AUTOGYRO				
FRIDAY JUNE 2 7:00 A.M. TO 6:00 P.M.		FAC. SCALE BOSTONIAN PISTACHIO HIGH WING MONO				PENNYPLANE MANHATTAN		★	PENNYPLANE MANHATTAN					BANQUET			
						BOSTONIAN MASS LAUNCH 11:30											
SATURDAY JUNE 3 7:00 A.M. TO 6:00 P.M.		GOLDEN AGE COCONUT SCALE NO-CAL SCALE PEANUT SCALE F.R.O.G.				LTD. PP		★	LTD. PP								
						COCONUT SCALE MASS LAUNCH 11:30											
SUNDAY JUNE 4 7:00 A.M. TO 6:30 P.M.		MINI STICK KIT PLAN AMA SCALE				EZB		★	EZB								
						MINI STICK MASS LAUNCH 11:45											

★ Retrivial starts with last plane down.

CONTEST MANAGEMENT

HOWARD HENDERSON, BILL MARTIN, MARY JANE REILLY, JIM MILLER, ROY WHITE, LARRY COSLICK, GARY UNDERWOOD.

CONTEST MANAGER	CONTEST DIRECTOR	CONTEST DIRECTOR
HOWARD HENDERSON	**ROY WHITE**	**LARRY COSLICK**
444 BRYAN	1025 CEDAR ST.	4202 VALLEY CREST HILLS DR.
ST. LOUIS, MO 63122	CATAWISSA, MO 63015	ST. LOUIS, MO 63128
PH. 314-822-3980	**PH. 314-271-2243**	**PH. 314-892-3803 AFTER 10 P.M.**

TABLE AND CHAIRS

If you are driving, please *BRING TABLES AND CHAIRS ALONG.* There will be a limited amount of tables and chairs available for rent at $14.00 for the contest (1 table and 2 chairs*). No partial days rent—you may do your subleasing (no gouging!) NOTICE: *You are responsible to pick up your table and chairs and return them at the end of the meet.*

LIGHTING

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

SCALE JUDGING

Models must be submitted with documentation and contestants name—FAC Scale, Bostonian, Pistachio, and High-Wing Mono by 3:00 p.m. on Thursday, June 1. Golden Age, Coconut and P-Nut Scale by 12:00 on Friday, June 2. Kit Plan and AMA Scale by 3:00 p.m. on Saturday, June 3. Turn-in room located at northeast end of dome.

REGISTRATION

Pick up your flying packet between 9:00 a.m. and 5:00 p.m. on May 31 at the registration desk.

All Seniors and Open fliers will be required to time flight and assist as called upon (be happy and VOLUNTEER!) *Bring Your Own Stopwatch!*

All 1995 AMA rules apply. All rule change "proposals" DO NOT APPLY!

PRACTICE

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

Boxes may be dropped off at the Mini-Dome between 5:00 p.m. and 7:00 p.m on May 30. Absolutely no flying in Mini-Dome prior to May 31.

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

(Ceiling—116', floor—208'x420').
Astroturf may not be on floor.

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

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

Entries must be postmarked by April 23, 1995. Late fee $10.00 payable on site.

RULES FOR FAC EVENTS

1. No P-Nut Sized Models.
2. If you have any questions on FAC events, send a self-addressed stamped envelope or self-addressed postcard to: Jim Miller, 107 Lorelei Drive, Fayetteville, OH 45118.

COCONUT AND PISTACHIO SCALE

For contest rules, send a large self-addressed stamped envelope to Dr. J. Martin, 2180 Tigertail Avenue, Miami, FL 33133.

F1D AND AMA H.L. STICK

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

CATAPULT GLIDER

Standard

1. Maximum wingspan—12".
2. Maximum wing chord—3.
3. Maximum launching stick length—6".
4. Nine official flights (all launches count).
5. Sum of best two flights determines winner.

Unlimited

1. See AMA rules.

MINI STICK RULES

- Wingspan 7" max.
- Wing chord 2-1/2" max.
- Length, front bearing to rear most point 10" max.
- Motor stick front bearing to rear hook 5".
- Stab area max 50% of wing.
- All wood prop 7" max. diameter.
- Any covering except micro-film.
- No exotic materials & no fancy gadgets permitted.
- .43 grams/.015 oz. min. wet. less rubber.
- Best flight of 5 officials. 20 sec. min. 2 attempts/flight.
- Mass launch. One flight. Last one down wins.

Note: A perpetual Burr Stanton memorial trophy will be presented in Mini Stick by the I.M.A.R.C. (Indoor Model Association of River City.)

NO-CAL PROFILE SCALE

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

UNLIMITED RUBBER SPEED

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

KIT PLAN SCALE

See AMA Rule Book.

USIC FEDERATION ROG

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

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

PRO-20

1. Maximum projected wing span—20".
2. Maximum projected wing area—68 sq. in.
3. Maximum stabilizer area 50% of wing area.
4. Propeller: Must be built up. Microfilm or plastic covered. No variable pitch or variable diameter mechanisms permitted. Propeller hubs which permit blade replacement and manual adjustment of pitch are acceptable.
5. Motor Stick: Must be built up (no solid motor sticks).
6. Energy restraining devices other than the propeller are prohibited.
7. In addition to the above, Rules for Free Flight Indoor rubber and stick models shall apply.

P-24 CONDOR

1. The model must be built according to plan. No deviation will be allowed.
2. The 7-inch plastic prop provided must be used with no alterations. Clay or tape may be added for balance.
3. The prop shaft may be lengthened to clear the plastic thrust bearing.
4. Minimum weight for the model is 12 grams.
5. Japanese tissue must be used for covering the model.
6. Tip dihedral must be 1¾ inches.
7. The distance between the front hook and the rear motor hook must be 17 inches.
8. The same motor must be used throughout the competition. If the motor breaks, it can be retied.
9. The last ten planes to land from the mass launch will have a fly off. The last five of these planes will have a fly off. Finally, the last two will have fly off for a winner.

KIT AVAILABLE FROM MACE MODEL AIRPLANE CO., 359 So. 119th East Avenue, Tulsa, OK 74128, Phone (918) 437-5490. Cost $9.95 plus $2.00 postage.

PLANS AVAILABLE from Larry Coslick, address on other side.

35 CM STICK

1. 13.77 inch wingspan projected.
2. In addition to the above, rules for free flight indoor rubber and stick models shall apply.

USIC GRAND CHAMPION (J S O COMBINED)

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

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

Awards to 3 places or more per event depending on the number of entries.

Dormitory Housing will be in Carter Hall (see map). DORMITORY RULES WILL BE STRICTLY ADHERED TO. If you share a room, each person must be registered to that room. We have instructed the dormitory staff to advise us of anyone who is in violation of dormitory rules. Removal from the dormitory and expulsion from participating in the USIC could result. Rules will be in flying packet.

LODGING

BROADWAY HOTEL, INC., P.O. Box B-CRS, 37602. 2808 North Roan Street (615) 282-4011. 80 units.

CAPRI MOTEL, P.O. Box 5114-EKS, 37603. 3008 West Market Street. (615) 926-2952. 12 units.

COMFORT INN, 1515 US 19-E By-Pass, Elizabethton, TN (615) 542-4466. 58 units.

DAYS INN, 2312 Brownsmill Road. (615) 282-2211.

11-E MOTEL, Route 3, Box 451, 37604. Hwy. 11-E and 321 South. (615) 928-2131. 25 units.

ECONOMY INN, 106 West Millard Street, 37601. (615) 926-4131. 112 units.

FAIRFIELD INN, 207 East Mountcastle Drive, 37601. Reservations (615) 282-3335. 132 rooms.

FAMILY INNS OF AMERICA, at Buffalo Mountain Resort. Route 2, 100 Country Club Drive, Unicoi, TN 37692. (615) 743-9181. 69 units.

FOX MOTEL, 3406 West Market Street, 37604. (615) 928-0267. 22 units with kitchen.

GARDEN PLAZA HOTEL, 211 Mockingbird Lane, 37601. (615) 929-2000. 187 units. $57.00 per night with double occupancy.

HOLIDAY INN-Johnson City, 2406 North Roan Street, 37601. (615) 282-2161. 197 units.

JOHNSON INN, 2700 West Market Street, 37601. (615) 926-8145. 44 units.

JONESBOROUGH BED & BREAKFAST, P.O. Box 722, Jonesborough, TN 37659. (615) 753-9223. 8 rooms.

RED ROOF INN, 210 Broyles Drive, (615) 282-3040. 115 rooms.

ROBERTSON HOUSE, 212 East Main Street, Jonesborough, TN 37659. (615) 753-3039. 3 units.

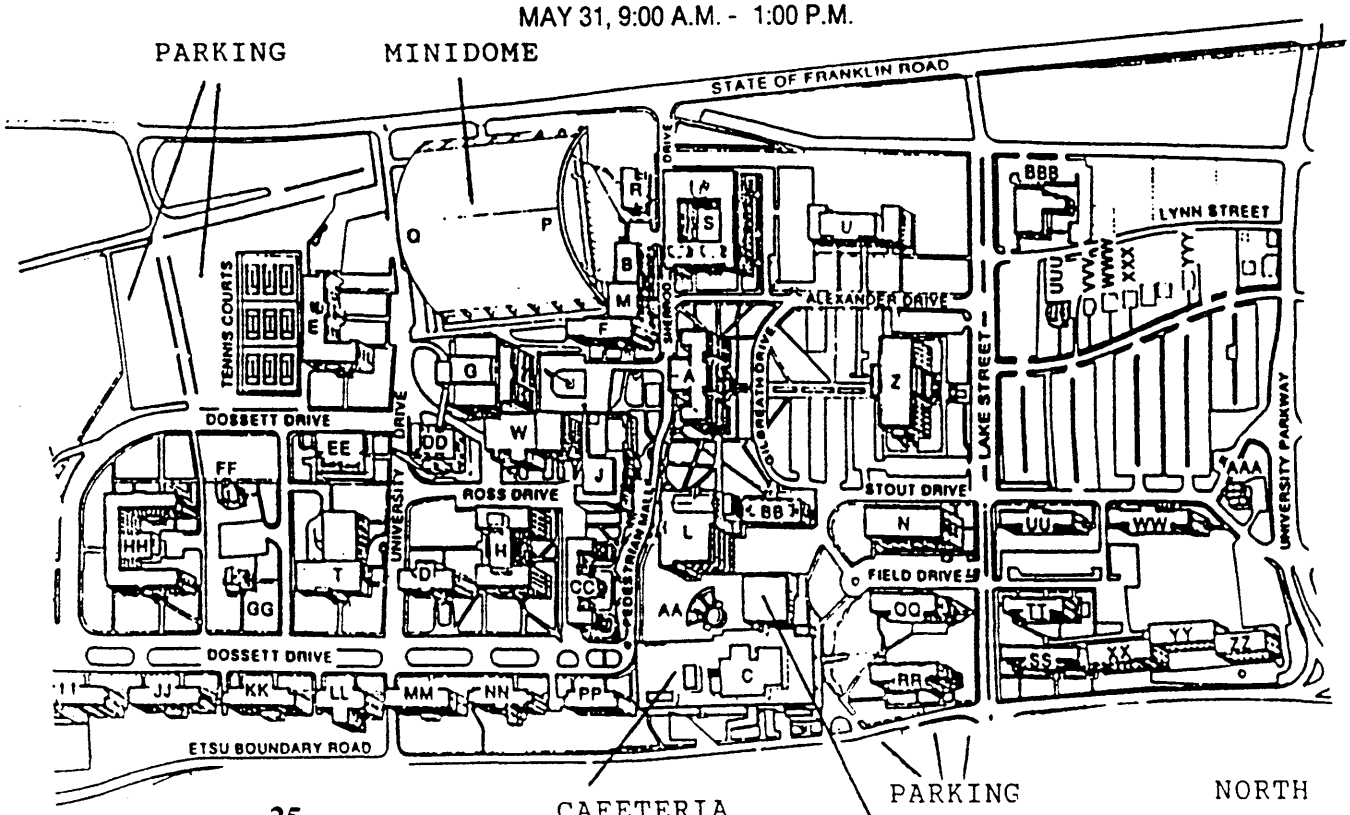
SHERATON HOTEL, 101 West Springbrook Drive, 37604. 205 units. $61.00 per night with double occupancy. Reservations 800-325-3535. State you are part of NFFS for special rate.

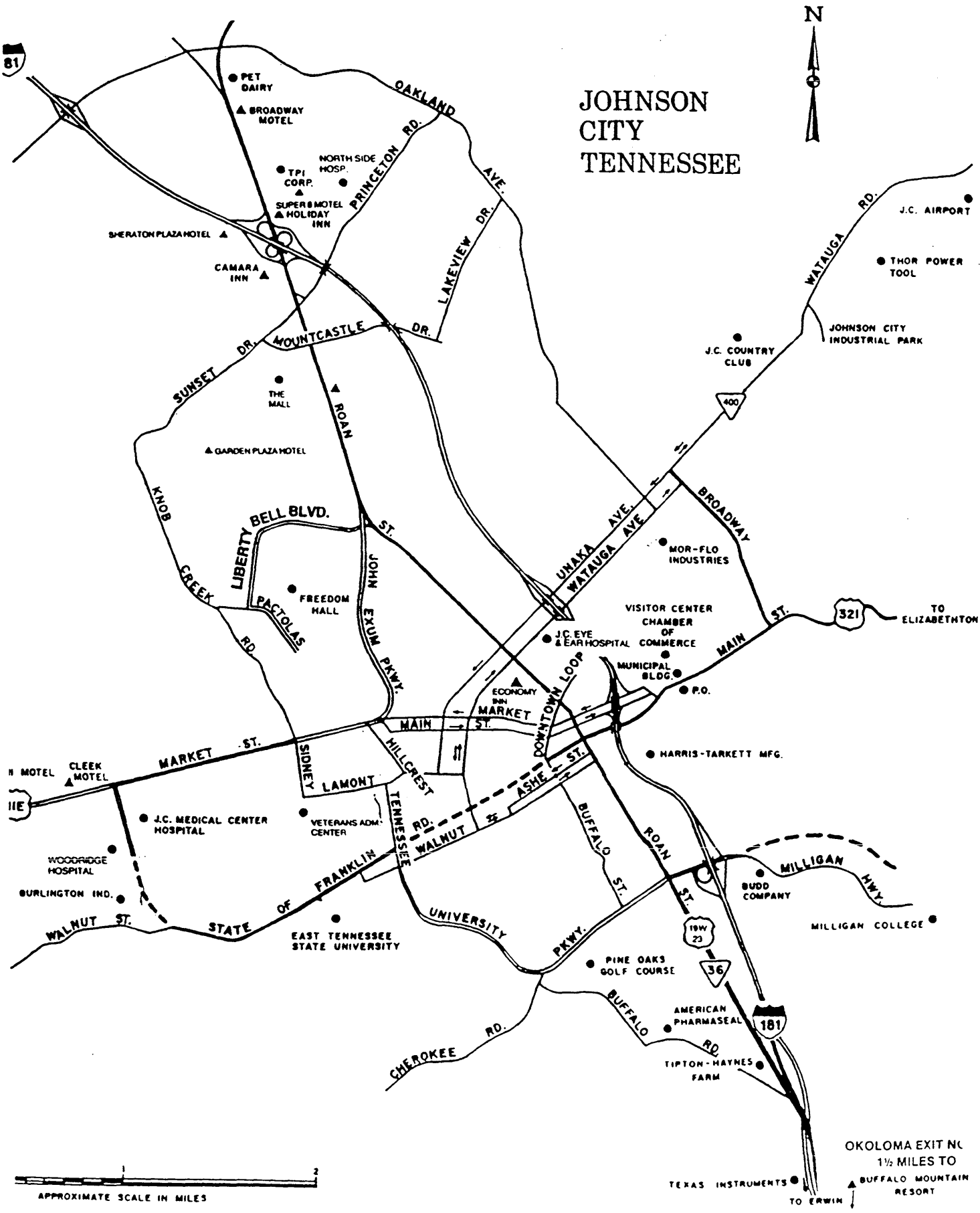
SUPER 8 MOTEL, 108 Wesley Street, 37601. (615) 282-8818. 63 units.

TENNESSEE HILLS MOTEL, Route 1, Box 197, Unicoi, TN 37692. (615) 743-5680. 24 units.

WHEN CALLING FOR RESERVATIONS, STATE YOU ARE PART OF NFFS USIC FOR POSSIBLE SPECIAL RATE.

DORMITORY CHECK-IN TIME
MAY 30, 6:00 P.M. - 10:00 P.M.
MAY 31, 9:00 A.M. - 1:00 P.M.




JOHNSON CITY TENNESSEE
N
81
PET DAIRY
BROADWAY MOTEL
OAKLAND AVE.
PRINCETON RD.
NORTH SIDE HOSP.
TPI CORP.
SUPER 8 MOTEL
HOLIDAY INN
SHERATON PLAZA HOTEL
CAMARA INN
LAKEVIEW DR.
WATAUGA RD.
J.C. AIRPORT
THOR POWER TOOL
JOHNSON CITY INDUSTRIAL PARK
J.C. COUNTRY CLUB
MOUNTCASTLE DR.
SUNSET DR.
THE MALL
ROAN
GARDEN PLAZA HOTEL
400
KNOB CREEK
LIBERTY BELL BLVD.
ST.
JOHN EXUM PKWY.
UNAKA AVE.
WATAUGA AVE.
BROADWAY
MOR-FLO INDUSTRIES
FREEDOM HALL
PACTOLAS
RD.
VISITOR CENTER
CHAMBER OF COMMERCE
J.C. EYE & EAR HOSPITAL
MAIN ST.
321
TO ELIZABETHTON
MUNICIPAL BLDG.
P.O.
ECONOMY INN
MARKET
MAIN ST.
DOWNTOWN LOOP
HARRIS-TARKETT MFG.
MARKET ST.
CLEEK MOTEL
SIDNEY
LAMONT
MILLCREST
ASHE ST.
J.C. MEDICAL CENTER HOSPITAL
VETERANS ADM. CENTER
TENNESSEE RD.
WALNUT ST.
BUFFALO ST.
ROAN ST.
MILLIGAN HWY.
WOODRIDGE HOSPITAL
BURLINGTON IND.
FRANKLIN
STATE OF
WALNUT ST.
EAST TENNESSEE STATE UNIVERSITY
UNIVERSITY PKWY.
BUDD COMPANY
MILLIGAN COLLEGE
19W 23
36
PINE OAKS GOLF COURSE
AMERICAN PHARMASEAL
181
BUFFALO RD.
CHEROKEE RD.
TIPTON-HAYNES FARM
OKOLOMA EXIT NC
1½ MILES TO
BUFFALO MOUNTAIN RESORT
TEXAS INSTRUMENTS
TO ERWIN
1
2
APPROXIMATE SCALE IN MILES

FOURTEENTH UNITED STATES INDOOR CHAMPIONSHIPS
MAY 31, JUNE 1, 2, 3, 4, 1995
"MINI-DOME" - East Tennessee State University, Johnson City, Tennessee

Sponsored by: **National Free Flight Society**

Send Entry Payable To:
USIC, 444, Bryan, St. Louis, MO 63122

NAME _____

STREET _____ JUNIOR ☐ SENIOR ☐ OPEN ☐

CITY _____ STATE _____ ZIP _____

PHONE _____

I hereby certify that I understand all of the rules which I will compete and will diligently follow the official AMA Safety Code as well as any that may be established on site as well as apply the use of good accepted common sense in all my flying and affairs at the contest site.

Signature _____

ALL ENTRANTS MUST BE AMA MEMBERS OR MEMBERS OF THEIR COUNTRY'S GOVERNING BODY.
(CONTESTANTS PROVIDE COPY OF MEMBERSHIP CARD WITH ENTRY FORM.)

FEES:

Basic Entry Fee includes one event.

USIC Entry - Open	$30.00	_____
Junior and Senior Entry	$5.00	_____
Additional USIC Events - Open	$7.00 ea.	_____
Junior and Senior	$1.00 ea.	_____
$ Dormitory		_____
Banquet	$21.00	_____
8' Table & 2 Chairs (must submit with entry)	$14.00	_____
	TOTAL FEES:	_____

Make checks payable to USIC:

Are you a member of NFFS? ☐ Yes ☐ No

OVERSEAS ENTRANTS MUST INCLUDE $10.00 INSURANCE FEE.
Banquet will be held at the Sheratorn Plaza Hotel (see schedule).

DORMITORY AT ETSU RESERVATION

Single Occupancy Room ..... $28.00 per night

Double Occupancy Room ..... $30.00 per night

Triple Occupancy Room ..... $40.00 per night

No linen will be provided, so bring your own (sheets, pillow cases, towels, etc.). For double and triple occupancy rooms, you must recruit your own room mate or mates. Some rooms are with bath and others have adjoining baths (shared). NOTE: A $25.00 fee will be charged for lost or unreturned keys. No exceptions.

Rebates will be made as appropriate on rooms.

Dormitory Housing will be in Carter Hall (see map).

☐ **EVENTS ENTERED**

USIC

☐ 201	Hand Launch Stick	
☐ 202	Intermediate Stick	
☐ 203	F I D	
☐ 204	ROG Cabin	
☐ 205	Manhattan	
☐ 206	EZB	
☐ 207	Penny Plane	
☐ 208	Limited Penny Plane	
☐ 209	Helicopter	
☐ 210	Ornithopter	
☐ 211	Autogiro	
☐ 212	Hand Launch Glider	
☐ 213	Kit-Plan Scale	
☐ 215	Bostonian & Bostonian Mass Launch	
☐ 218	Std. Catapult Glider	
☐ 219	Unltd. Catapult Glider	
☐ 505	Peanut Scale	
☐ 507	AMA Scale	
☐	P-24 Mass Launch	No Charge

☒ **GRAND CHAMPION SELECTIONS (Please Circle)**

☐ 9 Hi-Wing Monoplane
☐ 10 FAC Scale
☐ 11 Golden Age

See CD for any non-official event flying.

☐ 1 Federation ROG
☐ 2 No-Cal Scale
☐ 3 Unltd. Rubber Speed
☐ 4 Pistachio Scale
☐ 5 Mini-Stick & Mass Launch
☐ 6 Coconut Scale & Mass Launch
☐ 7 35 CM Stick
☐ 8 PRO 20

***Please Indicate Reservation In:**

	MAY 30	MAY 31	JUNE 1	JUNE 2	JUNE 3	JUNE 4	No. of Rooms
Single Occ.							
Double Occ.							
Triple Occ.							

Name of room mates if known:

Must be postmarked by April 23, 1995
Late Entry Fee of $10.00 payable on site.

In Case Of Emergency, Please Contact:

Name _____

Street _____

City _____

State _____ Zip _____ Phone: _____

Send fees to:

USIC
444 Bryan
St. Louis, MO 63122

Note: You can join NFFS and AMA on premises. It is best if you join NOW!

World News

We repeat our special invitation to all of our overseas flyers! Make your plans now to fly in one of the best flying sites in America! The 1995 United States Indoor Championships will be held at the Eastern Tennessee State University in Johnson City, Tennessee. We will begin with a practice day on May 31, 1995. The contest will start on that evening and continue through June 4, 1995. The Banquet will be on Thursday evening. We welcome all of you!

Congratulations to Bob Bailey for setting a new record for 1.2g EZB of 26:42 at the United Kingdom Indoor Nationals!

CORRECTION

Andy Tagliafico
10039 SW Quail Post Rd
Portland, OR 97219
503-453-0546

TAN II UPDATE

Walt Van Gorder reports that 8/94 TAN II worked great at the King Orange Int'l contest, with no fraying at the knots.

INDOOR NEWS & VIEWS
is produced in St. Louis by

✍ Larry Coslick
✉ Roy White
✍ Mary Jane Reilly
✉ Howard Henderson
✍ Bill Martin

Dues: ✉ U.S. $9.00/yr
✉ Canada $12.00/yr
✉ Overseas $15.00/yr air mail

We will publish four to six issues per year, depending on the budget and availability of material.

The number at the far right of the label indicates when subscription expires.
A few back issues are available. Please write for details.

Send all dues and correspondence to

Roy White (INAV)
1025 Cedar Street
Catawissa, MO 63015

Encl:$_____Renewal_____New____

Name_____

Address_____

City/State/Zip_____

Suggestion_____

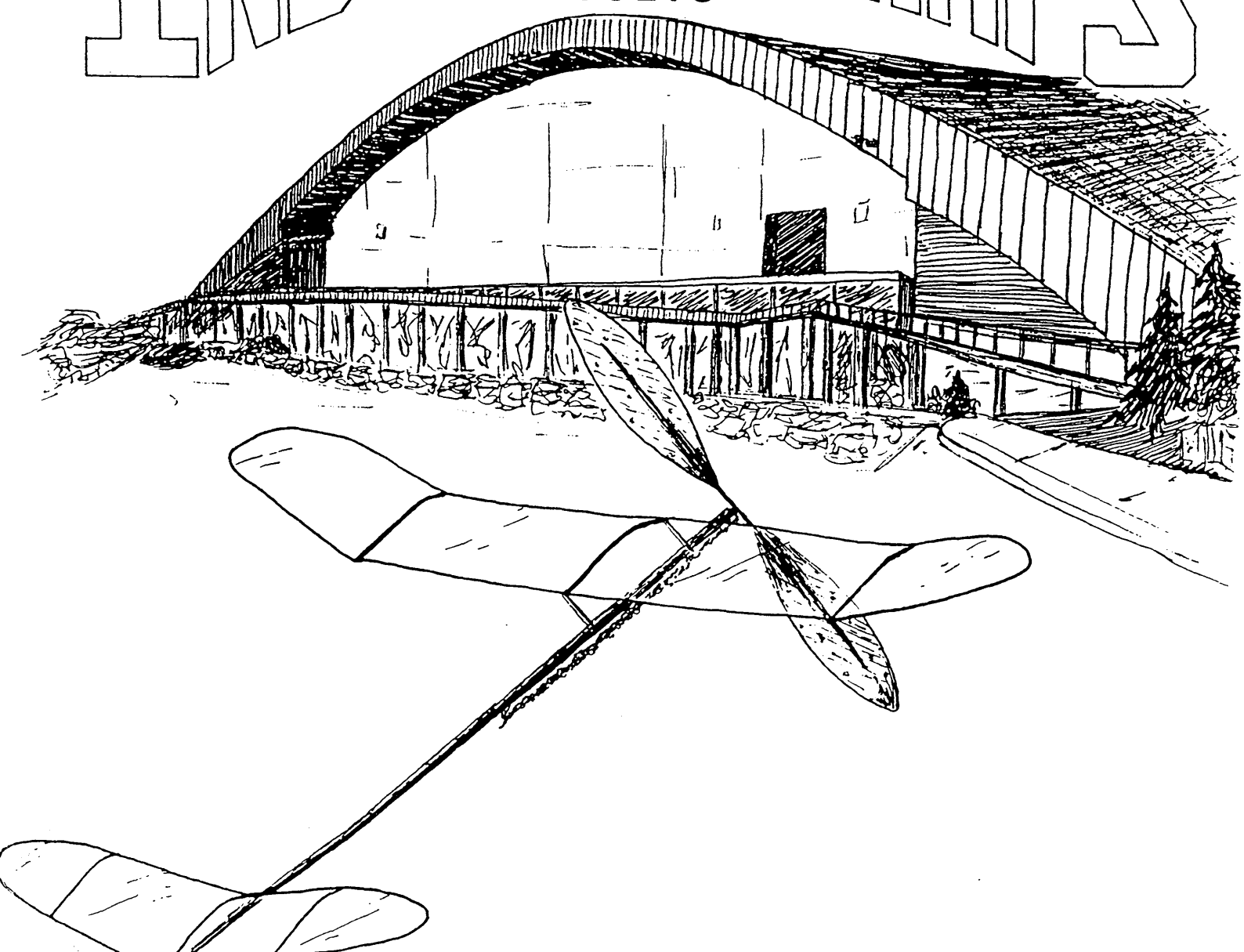
_____

INAV
Indoor News
and Views

ISSUE 184 JUNE 1995

1995 UNITED STATES INDOOR CHAMPS

RESULTS



Highlights of the 1995 U.S.I.C.

By Larry Coslick

The contest was a success, with only a few minor hitches. We were not prepared for the deluge of changes in flight schedules that occurred in the first two hours of allowable set-up time. The practice day had to be rearranged, so that modelers would not have to assemble and dis-assemble their models for the afternoon session.

Our first competition was P-24, a paper-covered stick model, with a plastic prop. Jim Clem won the Mass Launch with a nice flight of over 5 minutes.

We officially started the contest Wednesday evening with FID, 35cm Stick and Cabin ROG. Jack McGillivray did not waste any time in FID, and put up two 43 minute flights back-to-back to win first place in FID. A new site record of 27:30 in ROG Cabin was set by Larry Loucka. Tom Sova won 35cm stick.

Thursday morning, the air was filled with Catapult and Hand Launched Gliders. When the competition was finished, Mike Thompson placed first in both Standard and Unlimited Catapult Glider.

Thursday afternoon was devoted to Intermediate Stick, Ornithopter and Helicopter. Bernard Hunt quickly set the pace with a 36 minute flight in Intermediate Stick and backed it up with a 38 minute flight to capture first place. Ray Harlen has not participated in the USIC for several years. He said that his ornithopter had been in his model box for the past four years. Ray set a new Category IV Ornithopter record with a flight of 18:13. FID had already been decided the first day of competition, so most of the modelers concentrated on Hand Launched Stick. Bernard Hunt flew a newly designed FID tandem, with an 18 inch motor stick. The wing and stab are approximately 125 sq. in. each, and both are unbraced. He cranked it up the second day of competition and took Hand Launched Stick, with a great flight of 46:14.

Pro-20 was introduced to the East Coast this year. The model features a higher aspect wing than 35cm Stick and a good EZB design could be enlarged to meet the 68 sq.in. requirement. This model should do 30 minutes plus at a weight of around .4 gms. Ron Ganser set a new autogiro record with a flight of 12:48 in an event that he dominates.

Scale modelers had a chance to show their stuff on Friday. Doc Martin said that the Pistachio models were turning in times close to 2 minutes per flight.

Penny Plane showed Dan O'Grady leading the way with a great flight of 17:04.

If any of you feel that your age keeps you from competing, take a good look at the times Jim Grant is setting at 80 years of age. He is an inspiration to all of us! His planes (dyed red) are noticable to all. He flew a 374 sq.in. Hand Launched Stick this year, which made the Mini-Dome look small. Jim placed First in Manhattan Cabin, Third in Intermediate Stick & Fourth in Bostonian. He also won Bostonian Mass Launch.

On Saturday, Vladimir Linardic, a Senior from Canada, posted the best flight in Limited Penny Plane - 15:53. He was using a 12 x 16 prop, with a long loop of 8/93 TAN II and he cranked in 3600 turns. Jack McGillivray won Open Limited Penny Plane with 15:23.

The last and my favorite event was EZB. It started at noon on Sunday and it was evident from the start that the times were going to be high. The contestants are building lighter models, with very slow rotating props, and the models seemed to float to the ceiling. It was apparent that it was not necessary to crash around in the ceiling to get good times.

Ninety-six people attended the banquet on Friday night. The food was delicious and plentiful and everyone seemed to have a good time. We all enjoyed meeting our speaker, Ed Lockhart. All of us crowded around to see his tiny one-inch microfilm plane It flies on a motor made from a cross-section of the neck of a toy balloon. Amazing!

We hope that all of you had as much fun as we did. Our committee has such a good rapport that everything flowed, just like we knew what we were doing. We really do have mutual admiration for each other.

The 1996 Nationals and U.S. Indoor Championships will be held at Johnson City and will be sponsored by AMA and NFFS. The contest will begin on May 29 (Wednesday) and run through June 1, 1996. We look forward to seeing all of you next year.

****

New PM2L Plastic Covering Material

By Dick Obarski

The weight loss factor (approx. 2/1) of using PM2L vs. Microfilm is a deterrent, but dimensional stability, puncture and shock resistance are much better, all of which would minimize problems of shipping and handling models.

SPECIFICATIONS

	Weight. In oz. Per* 100 sq in.	Thickness in inches
Ultra Film (Ray Harlen)	.0045	.00006
Ultimate (Wayne Trivin)	.00366	.000047
PM2L	.00271	.0000353
Microfilm	.0015 Appx.	Varies

* above weights determined using a Harlen beam scale. Weight for microfilm varies depending on sheet color after pouring.

PM2L - USA pricing $15.00 - 15 ft.- P.Paid

Send to: R. W. Obarski
2112 N. Halcyon Drive
Sun City Center, FL 33573

CONTESTANT	AMA No	1	2	3	4	5	BEST FLIGHT	PLACE	CHAMP POINTS
01 Larry Coslick	4652	21:55	24:51	27:01	-	-	27:01	1	100
57 Bernard Hunt	SMAE56209	21:16	23:15	25:57	-	-	25:57	2	96.0
50 L Cailliau	79985	12:04	18:56	24:51	23:59	25:34	25:34	3	
104 L Barr	ENG	11:00	16:27	23:54	25:25	05:46	25:25	4	
49 J McGillivray	MAAC 1025L	22:00	25:06	24:57	-	-	25:06	5	92.9
19 W Van Gorder	19912	21:59	23:50	04:13	22:33	-	23:50	6	
64 M Thompson	1484	19:57	22:55	21:47	21:38	-	22:55	7	84.8
68 J Lenderman	879	20:40	22:50	17:48	-	-	22:50	8	
98 Larry Loucka	1210	20:41	22:39	19:47	21:57	-	22:39	9	
15 Jim Grant	159477	22:29	05:30	-	-	21:17	22:29	10	83.2
36 Ray Harlan	131	20:01	21:51	-	-	-	21:51	11	
83 John Marett	MAAC 651L	19:03	21:14	17:52	20:52	20:32	21:14	12	
84 W.L. Martin	41300	09:44	14:04	21:03	20:19	19:07	21:03	13	
25 Stu Weckerly	13250	07:03	13:43	15:18	20:48	15:25	20:48	14	
32 P Olshefsky	MAAC 864L	20:44	16:01	20:22	16:00	18:27	20:44	15	
53 Jim Clem	L-55	20:38	-	-	-	-	20:38	16	
21 Dick Obarski	560	16:33	17:27	20:27	-	-	20:27	17	
23 Dan O'Grady	MAAC 6192	20:19	00:12	06:58	-	-	20:19	18	
34 Joseph Nuszer	29036	16:4	20:03	-	-	-	20:03	19	
42 Gord Wisniewski	716	10:04	05:00	19:40	-	-	19:40	20	
18 Tom Sova	473169	17:11	13:49	14:21	17:59	19:38	19:38	21	
02 John Ganser	179424	17:06	18:01	19:34	18:28	16:54	19:34	22	
73 John Kagan	469254	05:00	16:05	17:17	07:54	19:30	19:30	23	72.2
65 R Hardcastle	847	19:06	04:32	11:55	-	-	19:06	24	
41 Rob Romash	130061	14:52	17:48	19:00	-	-	19:00	25	70.3
111 John Barker	2095	18:48	16:46	15:43	15:37	11:02	18:48	26	
46 Bob Eberele	4117	18:40	-	-	09:53	-	18:40	27	
92 Ted Seaver	397891	11:03	14:58	16:05	18:13	-	18:13	28	
120 Mark Vancil	124866	08:50	17:08	17:08	17:56	-	17:56	29	
121 Jon Vancil	338494	10:06	11:31	17:50	17:34	-	17:50	30	
115 Louis Leifer	MAAC 2418L	16:09	04:52	17:40	-	-	17:40	31	
103 H Phillips	?	17:17	17:39	-	-	-	17:39	32	
77 A Tagliafico	5533	17:36	16:45	09:25	-	-	17:36	33	
93 Fred Rash	63458	15:34	-	16:22	16:50	16:53	16:53	34	
79 J Diebolt		15:48	16:48	14:38	-	-	16:48	35	
102 Doug Barber	56270	14:21	10:36	16:16	-	-	16:36	36	
28 James Zufelt	MAAC 945	15:14	05:18	15:58	10:39	-	15:58	37	
70 D Raymond-Jones	63358	12:13	14:44	-	-	-	14:44	38	
123 Len Singer	209081	09:50	07:51	14:17	-	-	14:17	39	
44 K Van Bueren	51477	13:44	13:54	10:21	-	-	13:54	40	
96 Tony Italiano	2386	12:13	10:20	12:35	05:10	10:51	12:35	41	
03 J Chizmadia	33580	12:07	05:51	03:33	06:29	-	12:07	42	
24 Chester Wrzos	20454	10:45	10:29	10:35	-	-	10:45	43	
11 A Van Dover	894	06:53	10:05	10:45	-	-	10:45	44	
86 Bud Tenny	16718	06:15	08:12	07:48	-	-	08:12	45	
48 Doug Oleson	480646	-	-	-	-	-	00:00	46	
61 D Semeraro	460910	-	-	-	-	-	00:00	47	
118 S Schriver	459504	-	-	-	-	-	00:00	48	
76 Phil Hartman	8667	-	-	-	-	-	00:00	49	
75 L Wieczorek	10105	-	-	-	-	-	00:00	50	
80 W Miller	742	-	-	-	-	-	00:00	51	
117 Dan Belieff	12816	-	-	-	-	-	00:00	52	
04 Ed Sullivan	69585	-	-	-	-	-	00:00	53	
85 John Feilin	95353	-	-	-	-	-	00:00	54	

1995 USIC ----------PENNY PLANE #207----------

	CONTESTANT	AMA No	1	2	3	4	5	BEST FLIGHT	PLACE	GRAND CHAMP POINTS
23	Dan O'Grady	MAAC 6192	15:40	16:38	17:04	-	-	17:04	1	100
76	Phil Hartman	8667	16:04	16:56	14:36	-	-	16:56	2	
42	Gord Wisniewski	716	16:33	16:51	04:35	-	-	16:51	3	
53	Jim Clem	L-55	05:47	16:51	12:47	15:01	15:45	16:51	4	
98	Larry Loucka	1210	14:06	15:05	15:30	16:26	-	16:26	5	
15	Jim Grant	159477	14:20	14;43	15:57	16:11	07:13	16:11	6	94.8
68	J Lenderman	879	15:21	14:02	15:52	15:21	15:29	15:52	7	
32	P Olshefsky	MAAC 864L	15:08	12:34	09:36	15:52	13:37	15:52	8	
65	R Hardcastle	847	15:26	15:04	07:35	-	-	15:26	9	
02	John Ganser	179424	14:27	14:34	14:55	03:32	11:23	14:55	10	
41	Rob Romash	130061	14:15	14:49	-	-	-	14:49	11	
83	John Marett		13:20	14:09	13:40	14:31	13:06	14:31	12	
57	Bernard Hunt	SMAE56209	12:10	13:39	13:54	14:25	14:20	14:25	13	84.5
49	J McGillivray	MAAC 1025L	11:27	14:24	-	-	-	14:24	14	84.4
01	Larry Coslick	4652	14:23	-	-	-	-	14:23	15	
17	Gene Joshu	260643	09:18	13:43	14:20	13:07	14:10	14:20	16	
64	M Thompson	1484	13:31	14:08	13:30	-	-	14:08	17	82.8
120	Mark Vancil	124866	14:08	03:30	05:36	13:08	11:20	14:08	18	
18	Tom Sova	473169	08:54	07:04	13:01	13:45	10:41	13:45	19	
73	John Kagan	469254	09:28	08:21	12:44	13:24	13:43	13:43	20	80.3
21	Dick Obarski	560	13:39	03:56	13:39	03:41	-	13:39	21	
62	Robert Warmann	18748	13:38	11:54	07:01	07:42	-	13:38	22	
108	Vlad Linardic	MAAC 38165	05:39	07:35	09:40	12:22	13:37	13:37	23	
79	John Diebolt	97263	07:18	13:15	13:33	-	-	13:33	24	
45	Rob Eberele	411592	11:26	12:43	13:21	-	-	13:21	25	
93	Fred Rash	63458	10:51	12:51	03:37	-	-	12:51	26	
99	Chris Sydor	280169	12:51	11:28	12:35	12:11	-	12:51	27	
70	D Raymond-Jones	63358	08:10	08:25	12:39	-	-	12:39	28	
103	H Phillips	?	12:15	-	-	-	-	12:15	29	
85	John Fellin	95353	12:00	10:16	12:12	09:03	11:35	12:12	30	
28	James Zufelt	MAAC 945	08:25	11:09	08:43	11:57	-	11:57	31	
25	Stu Weckerly	13250	11:12	10:14	05:39	-	-	11:12	32	
115	Louis Leifer	MAAC 2418L	10:13	-	-	-	-	10:13	33	
96	Tony Italiano	2386	08:19	07:54	06:20	08:42	07:39	08:42	34	
102	Doug Barber	56270	05:13	08:32	05:34	08:18	-	08:32	35	
106	N. Leonard JR.		04:31	01:57	06:20	05:53	07:46	07:46	36	
26	Dave Henshaw	MAAC 226L	03:46	05:09	03:55	05:26	05:51	05:51	37	
11	A Van Dover	894	02:43	05:00	03;49	05:29	-	05:29	38	
34	Joseph Nuszer	29036	-	-	-	-	-	00:00	39	
63	Rich Ennis	45450	-	-	-	-	-	00:00	40	
40	Jim Jones	986	-	-	-	-	-	00:00	41	
86	Bud Tenny	16718	-	-	-	-	-	00:00	42	
24	Chester Wrzos	20454	-	-	-	-	-	00:00	43	
87	Vernon Hacker	44137	-	-	-	-	-	00:00	44	
67	Tom Green	2689	-	-	-	-	-	00:00	45	
104	L Barr	ENG	-	-	-	-	-	00:00	46	
59	Billie Landrum	52674	-	-	-	-	-	00:00	47	

	CONTESTANT	AMA No	1	2	3	4	5	BEST FLIGHT	PLACE	GRAND CHAMP POINTS
49	J McGillivray	MAAC 1025L	14:14	14:39	14:43	05:51	15:23	15:23	1	100
19	W Van Gorder	19912	14:58	11:16	14:19	14:09	-	14:58	2	
83	John Marett	MAAC 651L	13:47	14:56	-	-	-	14:56	3	
41	Rob Romash	130061	12:43	14:15	14:43	13:00	14:50	14:50	4	96.4
53	Jim Clem	L-55	14:39	14:46	05:53	13:55	-	14;46	5	
64	M Thompson	1484	14:05	14:23	14:37	14:22	13:52	14:37	6	95.0
98	Larry Loucka	1210	14:02	14;29	14;14	13:44	-	14:29	7	
68	J Lenderman	879	13:45	03:17	14:01	14;17	02;27	14:17	8	
32	P Olshefsky	MAAC 864L	14:09	13:59	08:50	12:53	12:35	14:09	9	
57	Bernard Hunt	SMAE56209	13:45	05:12	14:02	04:40	13:58	14:02	10	91.2
15	Jim Grant	159477	5:14	13:58	5:00	13:37	-	13:58	11	90.8
66	Richard Miller	179518	13;53	06:08	04:53	-	-	13:53	12	
65	R Hardcastle	847	13:50	10:00	11;06	-	-	13:50	13	
23	Dan O'Grady	MAAC 6192	13;50	02:44	10;03	10:35	-	13:50	14	
55	Phil Alvirez	228391	13:37	13:09	13:20	12:20	08:27	13:37	15	
74	Ron Ganser	7532	11;17	11:52	12:46	13:28	-	13:28	16	87.5
44	K Van Bueren	51477	13:22	13:23	12:36	-	-	13:23	17	
46	Bob Eberele	4117	13:19	03:20	12:52	13:23	-	13:23	18	
42	Gord Wisniewski	716	13:22	12:48	-	-	-	13:22	19	
62	Robert Warmann	18748	13:00	12:43	13:13	12:40	-	13:13	20	
80	W Miller	742	11:03	13;12	12:10	08:33	12;47	13;12	21	
111	John Barker	2095	10:33	12:01	13;07	01;38	11;21	13:07	22	
02	John Ganser	179424	11:53	12:36	13;01	-	-	13:01	23	
109	H Vonasek		10:26	10:16	11:54	12:42	05:26	12:42	24	
93	Fred Rash	63458	12:35	07:10	10:30	12:41	11:52	12:41	25	
70	D Raymond-Jones	63358	12:36	12;38	-	-	-	12;38	26	
37	William Pavek	319915	12:36	11:58	09:05	03:45	-	12:36	27	
104	L Barr	ENG	11:25	12:31	02:55	-	-	12;31	28	81.4
92	Ted Seaver	397891	08:09	03:19	12:08	12:24	11;26	12:24	29	
43	Herb Stevens	13086	02:30	12:23	07:50	09:17	-	12:23	30	
110	J Koptonak	?	10:16	10:55	11:57	11;31	12:08	12:08	31	78.9
21	Dick Obarski	560	10:16	2:55	12:04	2:57	3:17	12:04	32	
18	Tom Sova	473169	11:44	4:40	10:52	11:51	-	11:51	33	
25	Stu Weckerly	13250	11:43	11:50	09:34	03:16	08:49	11:50	34	
84	W.L. Martin	41300	11:20	09:18	11:04	11:24	11:20	11:24	35	
96	Tony Italiano	2386	10:06	11;13	09:39	08:36	07:47	11:13	36	
116	Jack Boone	107857	08:14	08;43	10:33	11:05	10:38	11:05	37	
86	Bud Tenny	16718	08:35	04:54	10:58	06;56	10:54	10:58	38	
59	Billie Landrum	52674	10:54	10:57	10:55	-	-	10:57	39	
102	Doug Barber	56270	09:35	09:55	10:46	09:46	09:51	10:46	40	
28	James Zufelt	MAAC 945	08:00	08:31	09:07	09:12	10:28	10:28	41	
120	Mark Vancil	124866	09:53	08:17	-	-	-	09;53	42	
73	John Kagan	469254	06;15	09:23	09:53	02;00	-	09:53	43	
105	Nick Leonard	497461	09:52	06:56	08:53	05:55	-	09;52	44	
82	D Campbell	346641	02:31	09:52	08:44	09:09	00:15	09:52	45	
103	H Phillips	?	09:47	-	-	-	-	09:47	46	
85	John Fellin	95353	08:13	08:44	09:35	09:37	-	09:37	47	
26	Dave Henshaw	MAAC 226L	07:46	08:53	06:51	08:58	04:09	08:58	48	
11	A Van Dover	894	8:21	7:21	8:58	5:54	8:41	8:58	49	
04	Ed Sullivan	69585	06:38	07:53	7:49	7:58	8:17	8:17	50	
58	R Stonecipher	372732	05:46	05;46	06:22	05:22	08:15	08:15	51	
114	Greg Krol	514743	03;49	03;22	08:07	-	-	08;07	52	
17	Gene Joshu	260643	8:01	-	-	-	-	8:01	53	
79	John Diebolt	97263	07:28	05:55	-	-	-	07:28	54	
24	Chester Wrzos	20454	06:49	04:54	06:18	-	-	06:49	55	
95	William Bigge	127L	02:11	04:10	05:18	-	-	05;18	56	
90	Louis Black	31369	03:32	04;13	04;37	-	-	04;37	57	
76	Phil Hartman	8667	03:32	-	-	-	-	03;32	58	
30	Walt Liszewski	?	02:02	-	-	-	-	02:02	59	
48	Doug Oleson	480646	-	-	-	-	-	00:00	60	
34	Joseph Nuszer	29036	-	-	-	-	-	00;00	61	
40	Jim Jones	986	-	-	-	-	-	00:00	62	
07	Harry Geyer	17708	-	-	-	-	-	0:00	63	
61	D Semeraro	460910	-	-	-	-	-	00:00	64	
67	Tom Green	2689	-	-	-	-	-	00:00	65	
72	C Culpepper	?	-	-	-	-	-	00:00	66	

CONTESTANT	AMA No	1	2	3	4	5	BEST FLIGHT	PLACE
104 L Barr	ENG	08:30	08:15	07:34	11:51	12:33	12:33	1
50 L Cailliau	79985	11:55	12;30	-	-	-	12:30	2
57 Bernard Hunt	SMAE56209	09:58	09:00	11:48	04;48	-	11:48	3
46 Bob Eberele	4117	09:26	08;15	11;45	07;20	-	11;45	4
80 W Miller	742	09:30	11:40	10:35	-	-	11:40	5
68 J Lenoerman	879	11;32	11:13	11;25	-	-	11:32	6
120 Mark Vancil	124866	-	11:07	-	-	-	11:07	7
77 A Tagliafico	5533	11:06	-	-	-	-	11:06	8
21 Dick Obarski	560	10:53	10:56	11:03	07:12	02:47	11:03	9
19 W Van Gorder	19912	10:52	-	-	-	-	10:52	10
55 Phil Alvirez	228391	10:43	10:48	10:12	10:43	-	10:48	11
64 M Thompson	1484	10:09	10:25	09:42	-	-	10:25	12
85 John Fellin	95353	09:46	10:02	08:53	06:09	-	10:02	13
53 Jim Clem	L-55	09:33	00:18	10:00	04:32	-	10:00	14
18 Tom Sova	473169	09:09	08:00	03:09	09:46	-	09:46	15
17 Gene Joshu	260643	09:41	04:27	09:35	07:48	-	09:41	16
121 Jon Vancil	338494	05:25	09:35	08:52	-	-	09:35	17
23 Dan O'Grady	MAAC 6192	09:30	02:27	-	-	-	09:30	18
44 K Van Bueren	51477	08:15	06:17	09:23	08:19	09:26	09:26	19
111 John Barker	2095	07:26	04:20	08:23	07:33	09:23	09:23	20
41 Rob Romash	130061	09:22	-	-	-	-	09:22	21
62 Robert Warmann	18748	00:18	09:14	08:10	08:26	06:59	09:14	22
36 Ray Harlan	131	09:09	08:59	-	-	-	09:09	23
02 John Ganser	179424	08:09	08:56	09:06	-	-	09:06	24
65 R Hardcastle	847	09:00	01:00	07:07	-	-	09:00	25
83 John Merett	MAAC 651L	08:27	06:38	08:54	-	-	08:54	26
86 Bud Tenny	16718	01:16	08:33	02:28	08:50	07:10	08:50	27
110 J Koptonak	?	08:11	08:04	02:24	08:29	07:37	08:29	28
92 Ted Seaver	397891	07:30	06:02	08:19	03:51	-	08:19	29
22 Chas Johnson	473525	05:41	07:42	08:15	07:10	07:29	08:15	30
79 John Diebolt	97263	07;47	02;01	-	-	-	07:47	31
84 W.L. Martin	41300	04:11	07:24	-	-	-	07:24	32
94 Edward Ripley	484619	00:40	06:05	01:47	07:15	00:32	07:15	33
73 John Kagan	469254	06:32	07:13	-	-	-	07:13	34
37 William Pavek	319915	06:59	07:10	07:09	06:51	-	07:10	35
70 D Raymond-Jones	63358	06:44	06:36	-	-	-	06:44	36
58 R Stonecipher	372732	03:08	06:43	04;08	-	-	06:43	37
123 Len Singer	209081	04:58	06:00	-	-	-	06:00	38
123 Len Singer	209081	04:58	06:00	-	-	-	06:00	39
106 Nick Leonard Jr	?	04:27	04:45	05:10	04:05	-	05:10	40
118 S Schriver	459504	00:26	01:43	01;38	01;46	01;34	01:46	41
48 Doug Oleson	480646	-	-	-	-	-	00:00	42
75 L Wieczorek	10105	-	-	-	-	-	00:00	43
95 William Bigge	127L						00:00	44
105 Nick Leonard	497461		MINI STICK MASS LAUNCH WINNER:				00:00	45
04 Ed Sullivan	69585						00:00	46
15 Jim Grant	159477	-	LARRY CAILLIAU			-	00:00	47
108 Vlad Linardic	MAAC 38165J	-				-	00:00	48
34 Joseph Nuszer	29036	-	-	-	-	-	00:00	49
45 Rob Eberele	411592	-	-	-	-	-	00:00	50
98 Larry Loucka	1210	-	-	-	-	-	00:00	51
26 Dave Henshaw	MAAC 226L	-	-	-	-	-	00:00	52
66 Richard Miller	179518	-	-	-	-	-	00:00	53
97 D Thomson	8410	-	-	-	-	-	00:00	54
59 Billie Landrum	52674	-	-	-	-	-	00:00	55

1995 USIC ----------STND CAT GLIDER- #218 ----------

CONTESTANT	AMA #	1	2	3	4	5	6	7	8	9	BEST FLT	2nd FLT	TOTAL BEST 2	PLACE	GRAND CHAMP POINTS
64 M Thompson	1484	72.6	81.5	78.3	83.0	77.3	76.5	80.4	76.5	82.2	83.0	82.2	165.2	1	100
14 Ralph Schlarb	322352	79.3	78.9	74.0	73.1	69.0	78.1				79.3	78.9	158.2	2	95.8
13 W Schlrb	14425	75.6	73.9	0.59	0.61	78.4	77.4	-	-	-	78.8	77.4	156.2	3	94.5
44 K Van Bueren	51477	71.6	73.1	72.3	70.7	69.6	73.6	69.6	76.5	73.4	76.5	73.6	150.1	4	90.9
117 Dan Belieff	12816	52.0	55.0	10.0	74.1	65.3	66.7	64.0	68.2	74.4	74.4	74.1	148.5	5	89.9
29 Bernie Boehm	92567	75.1	70.3	72.8	03.0	-	-	-	-	-	75.1	72.8	147.9	6	89.5
47 Keith Fulmer	31552	70.0	71.0	72.0	73.0	68.0	49.0	-	-	-	73.0	72.0	145.0	7	87.8
41 Rob Romash	130061	65.8	66.8	65.3	66.3	65.1	66.1	-	-	-	66.8	66.3	133.1	8	80.6
62 Robert Warmann	18748	35.8	29.2	55.5	43.8	75.2	10.8	26.8	10.3	-	75.2	55.5	130.7	9	79.1
107 W Passarelli	15623	59.3	61.7	63.1	60.4	65.5	57.8	64.3	59.7	54.9	65.5	64.3	129.8	10	78.6
93 Fred Rash	63458	63.9	63.5	58.0	38.7	51.0	56.7	-	-	-	63.9	63.5	127.4	11	77.1
74 Ron Ganser	7532	47.6	51.6	48.3	51.9	57.4	62.0	62.1	63.6	55.5	63.6	62.1	125.7	12	76.1
109 H Vonasek		51.7	51.4	48.7	51.0	48.5	28.2	59.6	61.4	63.3	63.3	61.4	124.7	13	75.6
110 J Koptonak	?	53.6	60.2	58.2	46.8	52.3	62.6	54.6	61.1	49.8	62.6	61.1	123.7	14	74.9
25 Stu Weckerly	13250	31.6	51.4	55.6	05.6	51.8	14.5	61.7	58.7	43.0	61.7	58.7	120.4	15	72.9
31 George Batiuk	135	47.1	49.4	49.6	51.5	52.0	55.7	56.5	55.9	56.2	56.5	56.2	112.7	16	68.2
42 Gord Wisniewski	716	43.5	49.6	26.3	50.6	48.5	34.1	58.4	-	10.0	58.4	50.6	109.0	17	66.0
52 D Brimmer	1097	15.0	24.0	25.0	47.0	43.0	47.0	26.0	21.0	14.0	47.0	47.0	94.0	18	56.9
99 Chris Sydor	280169	43.8	48.9	30.0	-	-	-	-	-	-	48.9	43.8	92.7	19	56.1
96 Tony Italiano	2386	33.5	34.1	39.3	39.8	39.1	43.3	41.6	39.8	36.8	43.3	41.6	84.9	20	51.4
86 Bud Tenny	16718	39.9	31.0	39.6	31.2	03.3	37.2	37.2	16.7		39.9	39.6	79.5	21	48.1
58 R Stonecipher	372732	14.5	07.3	24.8	19.3	24.5	25.2	06.8	13.3	22.6	25.2	24.8	50.0	22	30.3
46 Bob Eberele	4117	-	-	-	-	-	-	-	-	-	-	-	000.0	23	00
54 Jack Green	9282	-	-	-	-	-	-	-	-	-	-	-	000.0	24	00
59 Billie Landrum	52674	-	-	-	-	-	-	-	-	-	-	-	000.0	25	00
45 Rob Eberele	411592	-	-	-	-	-	-	-	-	-	-	-	000.0	26	00
72 C Culpepper	?	-	-	-	-	-	-	-	-	-	-	-	000.0	27	00
97 D Thomson	8410	-	-	-	-	-	-	-	-	-	-	-	000.0	28	00

1995 USIC ----------UNL CATAPULT GLIDER #219 ----------

CONTESTANT	AMA #	1	2	3	4	5	6	7	8	9	BEST FLT	2nd FLT	TOTAL BEST 2	PLACE	GRAND CHAMP POINTS
64 M Thompson	1484	81.1	76.9	78.4	75.7	75.9	82.3	83.1	83.1	82.4	83.1	83.1	166.2	1	100
62 Robert Warmann	18748	48.4	56.7	52.2	71.9	67.6	80.0	73.8	82.7	83.0	83.0	82.7	165.7	2	99.7
71 Jim Buxton	75154	77.3	80.0	78.8	81.3	81.7	61.0	--	-	-	81.7	81.3	163.0	3	98.1
14 Ralph Schlarb	322352	78.5	77.7	-	-	-	-	-	-	-	78.5	77.7	156.2	4	94
13 W Schlarb	14425	70.1	.45	70.3	77.3	76.5	75.0	-	-	-	77.3	76.5	153.8	5	92.5
117 Dan Belieff	12816	70.0	68.9	69.7	71.3	74.0	77.0	69.1	68.0	74.0	77.0	74.0	151.0	6	90.8
44 K Van Bueren	51477	58.6	62.2	65.7	70.2	68.2	75.4	73.6	70.8	68.4	75.4	73.6	149.0	7	89.6
93 Fred Rash	63458	46.7	01.0	41.3	65.1	64.1	38.5	-	-	-	65.1	64.1	129.2	8	77.7
29 Bernie Boehm	92567	58.1	53.1	61.1	66.0	63.0	61.0	-	-	-	66.0	63.0	129.0	9	77.6
54 Jack Green	9282	58.3	59.9	57.6	--	-	-	-	-	-	59.9	58.3	118.2	10	71.1
31 George Batiuk	135	50.1	56.2	48.8	49.0	53.4	36.0	-	-	-	56.2	53.4	109.6	11	65.9
52 D Brimmer	1097	15.0	11.0	21.0	39.0	13.9	16.3	43.2	43.0	45.1	45.1	43.2	88.3	12	53.1
25 Stu Weckerly	13250	30.4	40.4	38.0	05.0	14.8	-	-	-	-	40.4	38.0	78.4	13	47.2
95 William Bigge	127L	17.0	30.0	-	-	-	-	-	-	-	30.0	17.0	47.0	14	28.3
56 W Schlesinger	5954	18.0	20.0	19.0	20.0	21.0	19.0	21.0	21.9	22.1	22.1	21.9	44.0	15	26.5
47 Keith Fulmer	31552	-	-	-	-	-	-	-	-	-	-	-	000.0	15	
46 Bob Eberele	4117	-	-	-	-	-	-	-	-	-	-	-	000.0	16	
99 Chris Sydor	280169	-	-	-	-	-	-	-	-	-	-	-	000.0	17	
71 Jim Buxton	75154	-	-	-	-	-	-	-	-	-	-	-	000.0	18	
96 Tony Italiano	2386	-	-	-	-	-	-	-	-	-	-	-	000.0	19	

1995 USIC ----------FAI INDOOR(F1D)#203----------

CONTESTANT	AMA#	1	2	3	4	5	6	BEST FLT	2nd FLT	TOTAL BEST 2	PLACE	USA TEAM REGIONAL POINTS	GRAND CHAMP POINTS
49 J McGillivray	MAAC 1025L	30:27	43:50	43:59	-	-	-	43:59	43:50	01:27:49	1		100
98 Larry Loucka	1210	31:32	32:15	39:32	39:43	-	-	39:43	39:32	01:19:15	2		90.2
57 Bernard Hunt	SMAE56209	37:48	40:00	38:42	-	-	-	40:00	38:42	01:18:42	3		89.6
08 Bill Hulbert	13143	15:28	34:14	33:17	37:02	38:42	19:20	38:42	37:02	01:15;44	4		86.2
101 Richard Doig	5392	36:07	24:51	36:27	17:54	32:52	33:39	36:27	36:07	01:12:34	5		82.6
104 L Barr	ENG	25:59	32:40	34:52	-	-	-	34:52	32:40	01:07:32	6		76.9
73 John Kagan	469254	02:26	28:36	09:48	26:44	26:17	34:57	34:57	28:36	01:03:33	7		72.4
64 M Thompson	1484	25:28	29:27	-	-	-	-	29:27	25:28	00:54:55	8		62.5
45 Rob Eberele	411592	-	-	-	-	-	-	-	-	00:00:00	9		
108 Vlad Linardic	MAAC 38165J	-	-	-	-	-	-	-	-	00:00:00	10		
51 Ed Burke	153313	-	-	-	-	-	-	-	-	00:00:00	11		
65 R Hardcastle	847	-	-	-	-	-	-	-	-	00:00:00	12		
87 Vernon Hacker	44137	-	-	-	-	-	-	-	-	00:00:00	13		

1995 USIC ----------INTERMEDIATE STICK #202----------

CONTESTANT	AMA No	1	2	3	4	5	BEST FLIGHT	PLACE	GRAND CHAMP POINTS
57 Bernard Hunt	SMAE56209	36:08	38:06	-	-	-	38:06	1	100
01 L Coslick	4652	33:25	37:29	-	-	-	37:29	2	98.4
15 Jim Grant	159477	24:03	29:16	32:11	27:37	34:09	34:09	3	89.6
65 R Hardcastle	847	30:09	33:45	08:15	-	-	33:45	4	88.5
104 L Barr	ENG	31:15	-	-	-	-	31:15	5	82.0
98 Larry Loucka	1210	28:01	27:53	30:29	30:59	-	30:59	6	81.3
18 Tom Sova	473169	20:59	27:53	28;51	26:58	-	28:51	7	75.7
111 John Barker	2095	26:01	09:11	27:56	28:44	-	28:44	8	75.4
74 Ron Ganser	7532	24:23	26:09	28:11	-	-	28:11	9	73.9
21 Dick Obarski	560	20:02	26:25	24:14	-	-	26:25	10	69.3
23 Dan O'Grady	MAAC 6192	21:58	25:16	24:17	-	-	25:16	11	66.3
110 J Koptonak	?	17:26	23:19	24:48	24:07	24:17	24:48	12	65.0
117 Dan Belieff	12816	24:09	-	-	-	-	24:09	13	63.4
32 P Olshefsky	MAAC 864L	14:15	24:03	19:57	16:48	24:01	24:03	14	63.1
64 M Thompson	1484	22:45	21:53	22:47	-	-	22:47	15	59.7
83 John Marett	MAAC 651L	18:57	20:01	19:27	19:28	07:56	20:01	16	52.5
70 D Raymond-Jones	63358	10:39	17:16	-	-	-	17:16	17	45.3
108 Vlad Linardic	MAAC 38165J	15:41	-	-	-	-	15:41	18	41.1
76 Phil Hartman	8667	-	-	-	-	-	00:00	19	
45 Rob Eberele	411592	-	-	-	-	-	00:00	20	
19 W Van Gorder	19912	-	-	-	-	-	00:00	21	
80 W Miller	742	-	-	-	-	-	00:00	22	
87 Vernon Hacker	44137	-	-	-	-	-	00:00	23	
51 Ed Burke	153313	-	-	-	-	-	00:00	24	
49 J McGillivray	MAAC 1025L	-	-	-	-	-	00:00	25	
71 Jim Buxton	75154	-	-	-	-	-	00:00	26	
34 Joseph Nuszer	29036	-	-	-	-	-	00:00	27	

USIC 1995 ----------BOSTONIAN-#215----------

CONTESTANT	AMA#	1	2	3	4	5	FLIGHT	FIGHT	BEST 2	CHARISMA	TOTAL	PLACE
69 D Aronstein	97976	05:19	05:34	-	-	-	05:34	05:19	653	1.15	750.95	1
64 M Thompson	1484	04:17	04:47	04:36	-	-	04:47	04:36	563	1.19	669.97	2
01 Larry Coslick	4652	04:25	04:39	04:32	-	-	04:39	04:32	551	1.18	650.18	3
15 Jim Grant	159477	03:32	03:27	-	04:30	04:51	04:51	04:30	561	1.15	645.15	4
34 Joseph Nuszer	29036	03:26	04:20	04:26	04.02	-	04:26	04:20	526	1.15	604.90	5
119 Paul Avery	158011	04:06	04:16	03:26	-	-	04:16	04:06	502	1.20	602.40	6
107 W Passarelli	15623	02:12	03:39	03:54	03:59	-	03:59	03:54	473	1.18	558.14	7
37 William Pavek	319915	03:32	03:47	03:01	03:56	02:56	03:47	03:32	439	1.19	522.41	8
111 John Barker	2095	00:56	01:56	03:34	03:40	-	03:40	03:34	434	1.16	503.44	9
92 Ted Seaver	397891	02:30	03:44	03:17	02:15	03:04	03:44	03:17	421	1.14	479.94	10
43 Herb Stevens	13086	00:21	03:16	02:46	03:27	03:37	03:37	03:27	424	1.12	474.88	11
66 Richard Miller	179518	03:17	03:20	02:29	00:44	01:35	03:20	03:17	397	1.18	468.46	12
44 K Van Bueren	51477	02:37	00:44	02:54	03:06	03:13	03:13	03:06	379	1.09	413.11	13
73 John Kagan	469254	-	01:41	02:27	02:30	03:37	03:37	02:30	367	1.07	392.69	14
58 R Stonecipher	372732	01:36	01:31	02:12	02:23	02:02	02:23	02:12	275	1.15	316.25	15
27 Sidney Gilbert	1803	02:27	02:30	02:07	-	-	02:30	02:27	297	1.05	311.85	16
114 Greg Krol	514743	-	02:05	-	02:01	00:29	02:05	02:01	246	1.08	265.68	17
31 George Batiuk	135	01:42	00:31	01:18	01.57	-	01:57	01:42	219	1.19	260.61	18
103 H Phillips	?	02:11	00:50	-	-	-	02:11	00:50	181	1.09	197.29	19
11 A Van Dover	894	00:49	00:60	00;60	-	-	00:61	00:60	121	1.09	131.89	20
118 S Schriver	459504	00:29	00:39	00:55	00:54	01:07	01:07	00:55	122	1.03	125.66	21
84 W.L. Martin	41300	01:38	-	-	-	-	01:38	-	98	1.10	107.80	22
38 Ken Lazarus	371820	00:44	-	-	-	-	00:44	-	44	1.11	48.84	23
39 Bob Butsch		00:19	-	-	-	-	00:19	-	19	1.14	21.66	24
61 D Semeraro	460910	-	-	-	-	-	-	-			0	25
97 D Thomson	8410	-	-	-	-	-	-	-			0	26
72 C Culpepper	?	-	-	-	-	-	-	-			0	27
21 Dick Obarski	560	-	-	-	-	-	-	-	-		0	28
46 Bob Eberele	4117	-							-	1.10	0	29
91 Fred Dippel		-	BOSTONIAN MASS LAUNCH WINNER: JIM GRANT								0	30
20 Tom Savage	484618	-	-	-	-	-	-	-	-	1.14	0	31
36 Ray Harlan	131	-	-	-	-	-	-	-	-	1.08	0	32
112 Millard Wells	65503	-	-	-	-	-	-	-			0	33
76 Phil Hartman	8667	-	-	-	-	-	-	-			0	34
75 L Wieczerek	10105	-	-	-	-	-	-	-	-	-	0	35

1995 USIC ---------- F4C SCALE----------

CONTESTANT	AMA#	MODEL	1st FLIGHT	2nd FLIGHT	3rd FLIGHT	BEST FLIGHT POINTS	SCALE SCORE	TOTAL SCORE	PLACE
16 Jim Miller	89382	Voisin Hydro	1:15	1:27	-	73.5	87	160.5	1
49 J McGillivray	MAAC 1025L	SE-5	1:47	2:04	-	82.5	76.5	159	2
12 Dave Rees	33928	Nicholas Beasely	2:07	-	-	82.5	66.5	149.0	3
12 Dave Rees	33928	Piper Super Cruiser	2:10	-	-	82.5	62	144.5	4
25 Stu Weckerly	13250	Found Centennial	1:41	1:58	1:59	82.25	62	144.25	5
107 W Passarelli	15623	Nesmith Cougar	2:09	-	-	82.5	57	139.5	6
09 Dr.John Martin	712	Beardmore Inflexible	1:03	0:58	1:06	63	75	138	7
16 Jim Miller	89382	Martin MO-1	2:03	-	-	82.5	51	133.5	8
112 Miliard Wells	65503	Waco SRE	0:58	-	-	58	64	122	9
27 Sidney Gilbert	1803	Compur Swift	1:24	-	-	72	39	111	10
110 J Koptonak	?	Hellcat	0:49	60.0	:59	60	50	110	11
30 Walt Liszewski	?	Compur Swift	1:11	1:29	1:03	74.5	30	104.5	12
31 George Batiuk	135	PT-19	:54	0:48	:55	55	47	102	13
89 Robert Wells	512604	Heinkel 112	:33	-	-	33	39	72	14
66 R Miller	179518	Cessna C-34	-	-	-	-	47.5	-	-
113 B Hiscock	463447	Fokker D-7				-	44	-	-
52 D Brimmer	1097	Cessna C-37				-	56	-	-

1995 USIC ----------KIT PLAN SCALE - 213 ----------

CONTESTANT	AMA#	SUBJECT	1	2	3	4	5	BEST FLIGHT	BEST (MAX)	2nd FLIGHT	2nd (MAX)	FIDEL.CRAFT PNTS	BEST 2FLTS PNTS	TOT PNTS	PLACE
15 Jim Grant	159477	0-57 Taylorcraft	110	111	-	-	-	111	98	110	98	98		294	1
66 Richard Miller	179518	???????	120	111	-	-	-	120	95	111	95	95		285	2
09 Dr.John Martin	712	Dornier Komet	102	111	-	-	-	111.0	92	102	92	92		276	3
52 D Brimmer	1097	Taylorcraft	62	62.5	81.1	88	87	88	88	87	87	94		269	4
27 Sidney Gilbert	1803	Comper Swift	76	94	95	-	-	95	81	94	81	81		243	5
103 H Phillips	?	????????	66	70	-	-	-	70	70	66	66	92		228	6
56 W Schlesinger	5954	Pilatus Porter	56	58.2	61	63	62	63	63	62	62	92		217	7
38 Ken Lazarus	371820	?????	36	53	51.5	60	-	60	60	53	53	89		202	8
122 Glenn Campbell	15173	?????	28.3	46	-	-	-	46	46	28.3	28.3	92		166	9
16 Jim Miller	89382	??????	-	-	-	-	-	-	-	-	-	94		-	10
113 Wm Hiscock	463447	?????	-	-	-	-	-	-	-	-	-	82		-	11

1994 USIC --------HAND LAUNCHED STICK #201----------

CONTESTANT	AMA No	1	2	3	4	5	BEST FLIGHT	PLACE	GRAND CHAMP POINTS
57 Bernard Hunt	SMAE56209	41:07	46:14	-	-	-	46:14	1	100
101 Richard Doig	5392	37:25	20:35	41:31	19:38	-	41:31	2	89.8
104 L Barr	ENG	37:08	38:19	-	-	-	38:19	3	82.9
65 R Hardcastle	847	19:35	26:59	31:39	-	-	31:39	4	68.4
108 Vlad Linardic	MAAC 38165J	16:03	29:57	10:31	-	-	29:57	5	64.8
117 Dan Belleff	12816	26:24	26:37	28:45	-	-	28:45	6	62.2
64 M Thompson	1484	09:17	28:43	21:00	08:33	-	28:43	7	62.1
15 Jim Grant	159477	07:38	14:51	-	-	-	14:51	8	32.1
45 Rob Eberele	411592	06:38	-	-	-	-	06:38	9	14.3
50 L Cailliau	79985	-	-	-	-	-	00:00	10	
51 Ed Burke	153313	-	-	-	-	-	00:00	11	
87 Vernon Hacker	44137	-	-	-	-	-	00:00	12	
98 Larry Loucka	1210	-	-	-	-	-	00:00	13	

1995 USIC ----------MAN CAB #205----------

CONTESTANT	AMA No	1	2	3	4	5	BEST FLIGHT	PLACE	GRAND CHAMP POINTS
15 Jim Grant	159477	11:09	11:45	13:17	-	-	13:17	1	100
83 John Marett	MAAC 651L	09:10	09:18	09:53	11:36	12:35	12:35	2	94.7
19 W Van Gorder	19912	12:29	12:29	-	-	-	12:29	3	94.0
104 L Barr	ENG	09:42	10:58	10:15	10:58	-	10:58	4	82.6
66 Richard Miller		10:26	09:20	10:45	10:53	08:16	10:53	5	81.9
01 Larry Coslick	4652	10:24	10:10	10:26	10:40	-	10:40	6	80.3
79 John Diebolt	97263	06:24	06:59	10:27	-	-	10:27	7	78.7
74 Ron Ganser	7532	08:31	09:51	10:01	-	-	10:01	8	75.4
25 Stu Weckerly	13250	09:14	06:00	10:01	09:16	06:26	10:01	8	75.4
119 Paul Avery	158011	08:32	09:10	-	-	-	09:10	10	69.0
110 J Koptonak	?	07:44	08:14	08:45	06:16	08:49	08:49	11	66.4
36 Ray Harlan	131	-	05:40	-	-	-	05:40	12	42.7
28 James Zufelt	MAAC 945	03:11	04:22	04:49	-	-	04:49	13	36.3
11 A Van Dover	894	01:47	03:52	-	-	-	03:52	14	29.1
67 Tom Green	2689	-	-	-	-	-	00:00	15	0
98 Larry Loucka	1210	-	-	-	-	-	00:00	16	0

1995 USIC ----------NO-CAL SCALE----------

CONTESTANT	AMA No	1	2	3	4	5	BEST FLIGHT	PLACE
98 Larry Loucka	1210	7:03	7:05	7:44	8:02	-	8:02	1
62 Robert Warmann	18748	6:44	6:06	6:41	2:09	7:20	7:20	2
34 Joseph Nuszer	29036	6:03	6:21	4:51	6;45	-	6:45	3
41 Rob Romash	130061	5:24	5:28	2;44	5:35	-	5:35	4
21 Dick Obarski	560	5:01	5:01	3:27	5:27	5:21	5:27	5
104 L Barr	ENG	3:53	4:56	4:00	5:18	5:25	5:25	6
37 William Pavek	319915	4:44	4:43	5:22	4;59	5:12	5:22	7
02 John Ganser	179424	4:42	1:41	4:56	-	-	4:56	8
92 Ted Seaver	397891	3:46	3:46	3:14	3:45	4:20	4:20	9
115 Louis Leifer	MAAC 2418L	2:38	1:42	4:15	4:07	-	4:15	10
57 Bernard Hunt	SMAE56209	3:06	3:10	3:50	-	-	3:50	11
84 W.L. Martin	41300	3:35	3:32	2:20	3:43	3:14	3:43	12
11 A Van Dover	894	3:36	-	3:16	-	-	3:36	13
31 George Batiuk	135	3:05	3:25	-	-	-	3:25	14
93 Fred Rash	63458	3:22	-	-	-	-	3:22	15
60 Daniel Baird	29698	3:10	1:21	-	-	-	3:10	16
73 John Kagan	469254	1:54	2;35	-	-	-	2:35	17
44 K Van Bueren	51477	2:09	2:00	-	-	-	2:09	18
114 Greg Krol	514743	0:51	1:40	-	-	-	1:40	19
58 R Stonecipher	372732	0:46	1:30	0:54	-	-	1:30	20
39 Robert Butsch	93988	0;51	-	-	-	-	:51	21
100 David Franks	170859	-	-	-	-	-	0:00	22
43 Herb Stevens	13086	-	-	-	-	-	0:00	23
110 J Koptonak	?	-	-	-	-	-	0:00	24
38 Ken Lazarus	371820	-	-	-	-	-	0:00	25

1995 USIC ----------FEDERATION ROG----------

CONTESTANT	AMA No	1	2	3	4	5	BEST FLIGHT	PLACE
77 A Tagliafico	5533	07:39	02:59	09:15	-	-	09:15	1
60 Daniel Baird	29698	07:10	02:26	06:22	05:44	06:18	07:10	2
18 Tom Sova	473169	06:09	05:59	02:48	06:52	-	06:52	3
94 Edward Ripley	484619	03:40	04:31	05:42	04:21	05:47	05:47	4
93 Fred Rash	63458	00:38	04:2	02:10	-	-	04:42	5
53 Jim Clem	L-55	04:11	-	-	-	-	04:11	6
86 Bud Tenney	16718	01:16	-	-	-	-	01:16	7
79 John Diebolt	97263	-	-	-	-	-	00:00	8
92 Ted Seaver	397891	-	-	-	-	-	00:00	9
97 D Thomson	8410	-	-	-	-	-	00:00	10

1995 USIC ----------AUTOGYRO #211----------

CONTESTANT	AMA No	1	2	3	4	5	BEST FLIGHT	PLACE
74 Ron Ganser	7532	12:48	12:32	12:01	-	-	12:48	1
79 John Diebolt	97263	09;23	11:20	-	-	-	11:20	2
93 Fred Rash	63458	02:50	03;38	05:09	-	-	05:09	3
11 A Van Dover	894	00:10	00:31	00:26	01:04	00:08	00:31	4
98 Larry Loucka	1210	-	-	-	-	-	00:00	5
02 John Ganser	179424	-	-	-	-	-	00:00	6

1995 USIC ---------- GOLDEN AGE SCALE ----------

CONTESTANT	AMA#	SUBJECT	1	2	3	FLIGHT TOTAL	FLYOFFF	PLACE
09 Dr.John Martin	712	Dornier Komet						
16 Jim Miller	89382	Martin MD-1						
25 Stu Weckerly	13250	Ford AT	159	156	161	360	230	2
52 D Brimmer	1097	Cessna C-34						
56 W Schlesinger	5954	----------						
64 M Thompson	1484	Farman	132	141	123	360	?	-
108 Vlad Linardic	MAAC 38165J	----------						
110 J Koptonak	?	Cessna C-34						
49 J McGillivary	MAAC 1025L	Cessna C-38	161	173	157	360	248	1
66 Rich Miller	179518	Cessna C-34						
103 H Phillips	?	Dougls YO						
12 Dave Rees	33928	Nicholas Beasly	?	?	?	360	220	3

1995 USIC ---------- PISTACHIO SCALE ----------

CONTESTANT	AMA#	SUBJECT	1	2	3	4	5	6	7	8	9	TOTAL BEST 2	FLIGHT POINTS	STATIC POINTS	TOT	PLACE
09 Dr.John Martin	712	Goldwing	1:18	47.6	1:15	-	-	-	-	-	-	2:33	1	5	6	1
52 D Brimmer	1097	Citabria	54.0	1:00	46.0	53.9	38.0	1:03	53.9	1:00	57.9	2:03	4	3	7	2
12 Dave Rees	33928	Lacey M-10	45.0	52.0	1:07	59.0	-	-	-	-	-	2:06	3	5	8	3
27 Sidney Gilbert	1803	Fike	57.4	1:04	1;10	-	-	-	-	-	-	2:14.6	2	7	9	4
94 Edward Ripley	484619	Wee Bee	28.7	42.4	44.8	44.6	58.0	1:03	-	-	-	2:01	5	5	10	5
112 Millard Wells	65503	SE-5	40.4	36.9	-	-	-	-	-	-	-	1:17	7	4	11	6
89 Robert Wells	512604	Mig 17	13.0	20.8	23.6	-	-	-	-	-	-	44.4	10	2	12	7
56 W Schlesinger	5954	Couger AR	26.2	28.0	-	-	-	-	-	-	-	54.2	9	8	17	8
52 D Brimmer	1097	Bucker Jungman	-	-	-	-	-	-	-	-	-	-	-	1	-	-
95 William Bigge	127L	----------	-	-	-	-	-	-	-	-	-	-	-	-	-	-
09 Dr John Martin	712	Quetzloatl	57.5	59.6	58.0	-	-	-	-	-	-	1:57.6	6	5	11	-
112 Millard Wells	65503	Waco E	37.0	38.9	-	-	-	-	-	-	-	1:15	8	4	12	-

USIC 1995 ----------HI-WING MONOPLANE----------

CONTESTANT	AMA#	MODEL	1st FLIGHT	2nd FLIGHT	3rd FLIGHT	BEST FLIGHT	FLIGHT POINTS	SCALE POINTS	TOTAL POINTS	PLACE
64 M Thompson	1484	Lacey M-10	2:42	-	-	2:42	82.5	56	138.5	1
16 Jim Miller	89382	HI-MAX	2:27	-	-	2:27	82.5	53	135.5	2
27 Sidney Gilbert	1803	Lacey M-10	1:30	-	-	1:30	75	54	129	3
09 Dr.John Martin	712	Puss Moth	1:04	-	-	1:04	62	51	113	4
52 D Brimmer	1097	Lacey M-10	1:04	-	-	1:04	62	51	113	5
112 M Wells	65503	Cessna Cardinal	0:51	0:51	0:63	0:63	61.5	51	112.5	6
56 W Schlesinger	5954	Fike	0:35	0:33	0:34	0:35	35	52	87	7
89 R Wells	512604	Stout Ford AT	0:40	0:38	0:39	0:40	40	39	79	8
20 Tom Savage	484618	----------	-	-	-	-	-	-	000.0	9
39 R Busch	93988	Lacey M-10	-	-	-	-	-	55	000.0	10
113 Wm Hiscock	463447	----------	-	-	-	-	-	-	000.0	11

1995 USIC ----------PEANUT SCALE----------

CONESTANT	SUBJECT	1	2	3	4	5	6	7	8	9	SCALE SCORE	BEST FLIGHT	BEST MAX	2nd FLIGHT	2nd MAX	AVE BEST 2	SCALE+ AVE OF BEST 2	PLACE
Ron Ganser	Voison Hydro	78.0	82.0	153	112	-	-	-	100	-	118.35	153	118.3	112	112	115.7	233.53	1
J McGillivray	Isaac's Fury	85.0	101.0	113	-	-	-	-	90.4	-	107.18	113	107.18	101	101	104.09	211.27	2
M Thompson	1935 Farman	114	99.09	-	-	-	-	-	77.0	-	90	114	90	99.09	90	90	180	3
W Passarelli	PAMA	86.0	121	-	-	-	-	-	-	-	85.5	86.0	85.5	81	81	83.25	168.75	4
Jim Grant	Gipsy Moth	59.7	50.8	58.2	-	-	-	-	-	-	102.15	60.8	-	59.7	-	60.25	162.4	5
Stu Weckerly	DH-6	71.0	72.0	-	-	-	-	-	-	-	85.0	72.0	-	71.0	-	71.5	156.5	6
Mark Vancil	Vagabond	82.0	58.0	79.0	-	-	-	-	-	-	74.98	82.0	74.98	79.0	74.98	74.98	149.96	7
Sidney Gilbert	Lacey M-10	85.0	116	132	-	-	-	-	-	-	68.95	132	68.95	116	68.95	68.95	137.90	8
Dr.John Martin	Ansaldo SVA	49.0	51.0	-	-	-	-	-	-	-	85.95	51.0		49.0		50.0	135.95	9
J Koptonak	Curtiss P40B	32.0	21.0	32.0	36.0	39.0	45.0	41.0	57.0	-	90.3	45.0	-	41.0	-	43.0	133.3	10
Millard Wells	Ansaldo SVA-5	52.1	51.0	50.8	-	-	-	-	-	-	74.9	52.1	52.1	51.1	51.0	51.55	126.45	11
S Schriver	Lacey M-10	46.9	53.9	51.3	65.5	61.7	66.9	73.5	73.0	-	63	73.5	63	73	63	63	126.0	12
Don Brimmer	Martin MO-1	42.6	41.5	26.5	22.5	29.0	45.0	34.9	-	-	76.65	45.0	-	42.5	-	43.8	120.45	13
Sidney Gilbert	Volksplane	31.0	53.3	56.5	-	-	-	-	-	-	64.05	56.5	-	53.3	-	54.9	118.95	14
Robert Wells	Andreason	48.0	45.0	-	-	-	-	-	-	-	61.25	48	-	45	-	46.5	107.75	15
George Batiuk	1911 Caudron	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0	16
Robt Wells	Aviatik 01	32.0	33.0	-	-	-	-	-	-	-	-	-	-	-	-	-	0	17
Bill Hiskock	Cessna Cardinal	-	-	-	-	-	-	-	-	-	50.75	-	-	-	-	-	0	18
Richard Miller	Volksplane	-	-	-	-	-	-	-	-	-	74	-	-	-	-	-	0	19
Robt Butsch	Beechcraft Stg	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0	20

1995 USIC ---------- AMA SCALE -#507----------

CONTESTANT	AMA#	SUBJECT	1	2	4	5	BEST FLIGHT	2nd FLIGHT	AVERAGE BEST 2	SCALE POINTS	TOTAL POINTS	PLACE
49 J McGillivray	MAAC 1025L	SE5 Replica	126	114	-	-	126	114	90	97.7	187.7	1
74 Ron Ganser	7532	1911 Cessna	99	114	-	-	114	99	90	97.5	187.5	2
16 Jim Miller		Voisin	95	95	-	-	95	95	90	97	187	3
107 W Passarelli	15623	Nesmih Cougar	92	139	-	-	139	92	90	83	173	4
25 Stu Weckerly	13250	Found Centenial Flt	113	108	-	-	113	108	90	78	168	5
122 Glenn Campbell	15173	J-3 Cub	38	52	60	67	67	60	63.5	75	138.5	6
110 J Koptonak	?	Miles Sparrow Hawk	60	75	73	-	75	73	74	62	136	7
15 Jim Grant	159477	Cranwell	-	-	-	-	-	-	-	-	000	8
106 Vlad Linardic	MAAC 38165J	----------	-	-	-	-	-	-	-	-	000	9

1995 USIC ---------- COCONUT SCALE ----------

CONTESTANT	AMA#	SUBJECT	1	2	3	BEST FLIGHT	FLIGHT RANKING	STATIC RANKING	TOTAL RANKING	PLACE
09 Dr.John Martin	712	Beardmore	1:07	1:05	-	1:07	5	4	9	
12 Dave Rees	33928	Piper Supe Cruis	1:50	1:57	-	1:57	-	1	-	
12 Dave Rees		Nicholas Beasley	2:27	-	-	2:27	2	2	4	1
25 Stu Weckerly	13250	Found	1:25	1:48	1:52	1:52	3	5	8	3
56 W Schlesinger	5954	DNF	-	-	-	-	-	-	-	
59 Billie Landrum	52674	Cessna Bird Dog	1:25	1:13	1:20	1:25	4	5	9	
69 D Aronstein	97976	Ant-25	3:35	4:05	-	4:05	1	3	4	2
69 D Aronstein		Miles M-18	-	-	-	-	-	6	-	
89 Robert Wells	512604	Focke W A-47	1:00	1:00	-	1:00	6	5	11	
112 Millard Wells	65503	Ford 2-AT	:52	:35	-	:52	7	4	11	

COCONUT MASS LAUNCH WINNER: DAVE ARONSTEIN

1995 USIC ----------HAND LAUNCHED GLIDER- #212 [OPEN]----------

CONTESTANT	AMA #	1	2	3	4	5	6	7	8	9	BEST FLT	2nd FLT	TOTAL BEST 2	PLACE	GRAND CHAMP POINTS
71 Jim Buxton	75154	70.8	75.0	73.6	68.4	71.1	74.2	-	-	-	75.0	74.2	149.2	1	100.0
29 Bernie Boehm	92567	67.0	71.3	73.1	72.0	70.0	75.3	69.6	70.3	71.5	75.3	73.1	148.4	2	99.4
64 M Thompson	1484	62.0	65.0	61.0	-	-	-	-	-	-	65.0	62.0	127.0	3	85.1
41 Rob Romash	130061	58.8	54.6	58.8	60.0	54.7	59.4	57.5	60.4	61.5	61.5	60.4	121.9	4	81.7
44 K Van Bueren	51477	55.5	54.8	59.2	51.6	50.5	55.8	49.8	51.0	42.7	59.2	55.8	115.0	5	77.1
110 J Koptonak	?	35.9	43.8	19.2	42.0	44.3	49.9	47.9	41.9	46.9	48.9	47.9	96.8	6	64.9
73 John Kagan	469254	27.8	29.2	28.7	26.8	32.5	38.5	39.3	-	-	39.3	38.5	77.8	7	52.1
11 A Van Dover	894	-	-	-	-	-	-	-	-	-	-	-	000.0		
46 Bob Eberele	4117	--	-	-	-	-	-	-	-	-	--	--	000.0		
43 Herb Stevens	13086	-	-	-	-	-	-	-	-	-	-	-	000.0		

1995 USIC ----------ROG CABIN #204----------

CONTESTANT	AMA No	1	2	3	4	5	BEST FLIGHT	PLACE	GRAND CHAMP POINTS
98 Larry Loucka	1210	15:05	22:09	21:46	27:30	-	27:30	1	
74 Ron Ganser	7532	14:33	-	-	-	-	14:33	2	
117 Dan Belieff	?	12:20	-	-	-	-	12:20	3	
59 Billie Landrum	52674	-	-	-	-	-	00:00		
79 John Diebolt	97263	-	-	-	-	-	00:00		

1995 USIC ----------ORNITHOPTER #210 ----------

CONTESTANT	AMA No	1	2	3	4	5	BEST FLIGHT	PLACE	GRAND CHAMP POINTS
36 Ray Harlan	131	17:24	05:25	18:13	-	-	18:13	1	100
01 L Coslick	4652	06:31	09:58	10:41	12:44	-	12:44	2	69.8
58 R Stonecipher	372732	01:55	02:33	01:45	-	05:47	05:47	3	31.7
94 Edward Ripley	484619	01:15	00:47	01:34	02:26	04:24	04:24	4	24.1
05 Roy White	6300	-	-	-	-	-	00:00		
17 Gene Joshu	260643	-	-	-	-	-	00:00		

1995 USIC ----------HELICOPTER #209----------

CONTESTANT	AMA No	1	2	3	4	5	BEST FLIGHT	PLACE	GRAND CHAMP POINTS
01 Larry Coslick	4652	09:35	-	-	-		09:35	1	100
41 Rob Romash	130061	07:08	-	-	-	-	07:08	2	73
79 John Diebolt	97263	00:00	00:00	03;58	02:18	05:30	05:30	3	57.4
93 Fred Rash	63458	02:12	03:19	-	-	-	03:19	4	34.6
99 Chris Sydor	280169	-	-	-	-	-	00:00		
98 Larry Loucka	1210	-	-	-	-	-	00:00		
95 William Bigge	127L	-	-	-	-	-	00:00		
73 John Kagan	469254	-	-	-	-	-	00;00		
11 A Van Dover	894	-	-	-	-	-	00:00		

1995 USIC ---------- UNLIMITED SPEED----------

CONTESTANT	AMA#	1	2	3	4	5	6	7	BEST MPH	PLACE
01 Larry Coslick	4652	6.8	-	-	-	-	-	-	14.2	1
114 Greg Kro.	514743	7.03	6.69	-		-	-	-	12.6	2
97 D Thomson	8410	-	-	-	-	-	-	-	00.00	

1995 USIC ----------HAND LAUNCHED GLIDER- #212 [Jr-Sr]----------

CONTESTANT	AMA #	1	2	3	4	5	6	7	8	9	BEST FLT	2nd FLT	TOTAL BEST 2	PLACE	GRAND CHAMP POINTS
99 Chris Sydor	280169	44.0	43.0	57.0	46.0	50.3	42.5	52.8	49.2	40.0	57.0	52.8	109.8	1	
45 Rob Eberele	411592	40.8	50.2	46.3	50.0	43.2	51.9	57.0	50.1	18.3	57.0	51.9	108.9	2	
118 Scott Schriver	459504	44.0	43.0	57.0	46.0	50.3	42.5	52.8	49.2	40.0	57.0	52.8	109.8	3	

1995 USIC -------- LIMITED PENNY PLANE #208 , (JR-SR) ----------

CONTESTANT	AMA No	1	2	3	4	5	BEST FLIGHT	PLACE	GRAND CHAMP POINTS
108 Vlad Linardic	MAAC 38165J	13:47	15:53	-	-	-	15:53	1	
45 Rob Eberele	411592	12:10	12:27	11:22	08:53	-	12:27	2	80.9*
106 Nick Leonard Jr	?	09:32	08:53	08:05	09:28	06:50	09:32	3	

1995 USIC ----------EZB- #206--(Jr-Sr)---------

CONTESTANT	AMA No	1	2	3	4	5	BEST FLIGHT	PLACE
108 Vlad Linardic	MAAC 38165J	01:38	20:51	22:56	24:08	-	24:08	1
45 Rob Eberele	411592	09:32	13:50	18:13	16:43	-	18:13	2

1995 USIC ----------35CM----------

CONTESTANT	AMA No	1	2	3	4	5	BEST FLIGHT	PLACE	GRAND CHAMP POINTS
18 Tom Sova	473169	19:11	18:02	18:27	13:57	17:02	19:11	1	100
41 Rob Romash	130061	15:00	16:31	12:42	-	-	16:31	2	86.1
34 Joseph Nuszer	29036	12:06	16:23	13:14	12:28	-	16:23	3	85.4
70 D Raymond-Jones	63358	10:05	12:43	00:17	13:11	13:48	13:48	4	71.9
24 Chester Wrzos	20454	-	-	-	-	-	00:00		
95 William Bigge	127L	-	-	-	-	-	00:00		
45 Rob Eberele	411592	-	-	-	-	-	00:00		
63 Rich Ennis	45450	-	-	-	-	-	00:00		

1995 USIC ----------PRO20----------

CONTESTANT	AMA No	1	2	3	4	5	BEST FLIGHT	PLACE
49 J McGillivray	MAAC1025L	28:09	-	-	-	-	28:09	1
77 A Tagliafico	5533	23:35	27:31	23:28	07:14	-	27:31	2
18 Tom Sova	473169	21:59	20:23	18:00	13:42	24:42	24:42	3
80 W Miller	742	18:37	06:36	21:11	24:11	23:40	24:11	4
70 D Raymond-Jones	63358	06:21	10:40	14:10	15:25	14:45	15:25	5
59 Billie Landrum	52674	-	-	-	-	-	00:00	6

1995 USIC GRAND CHAMPIO

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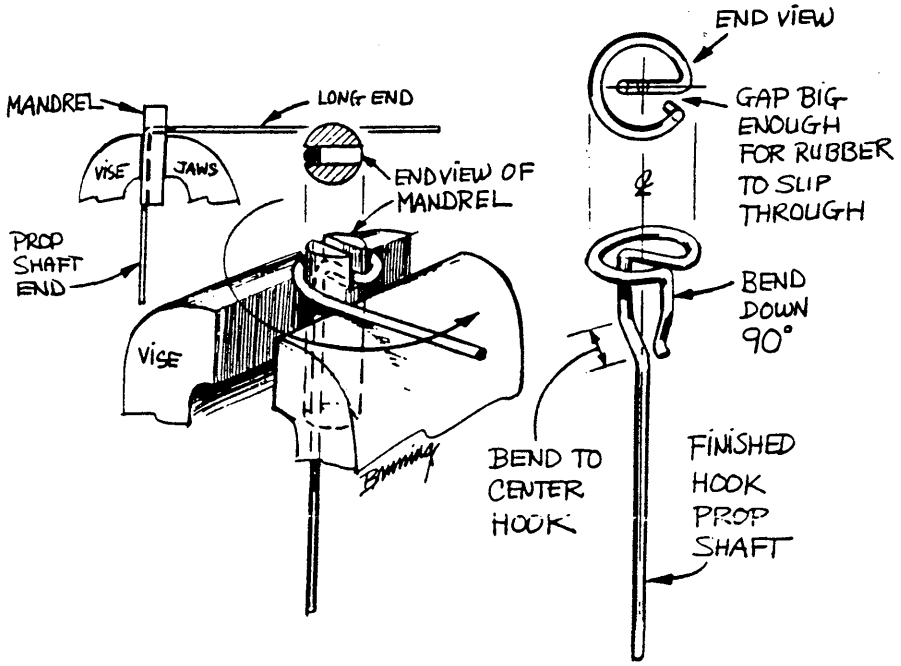
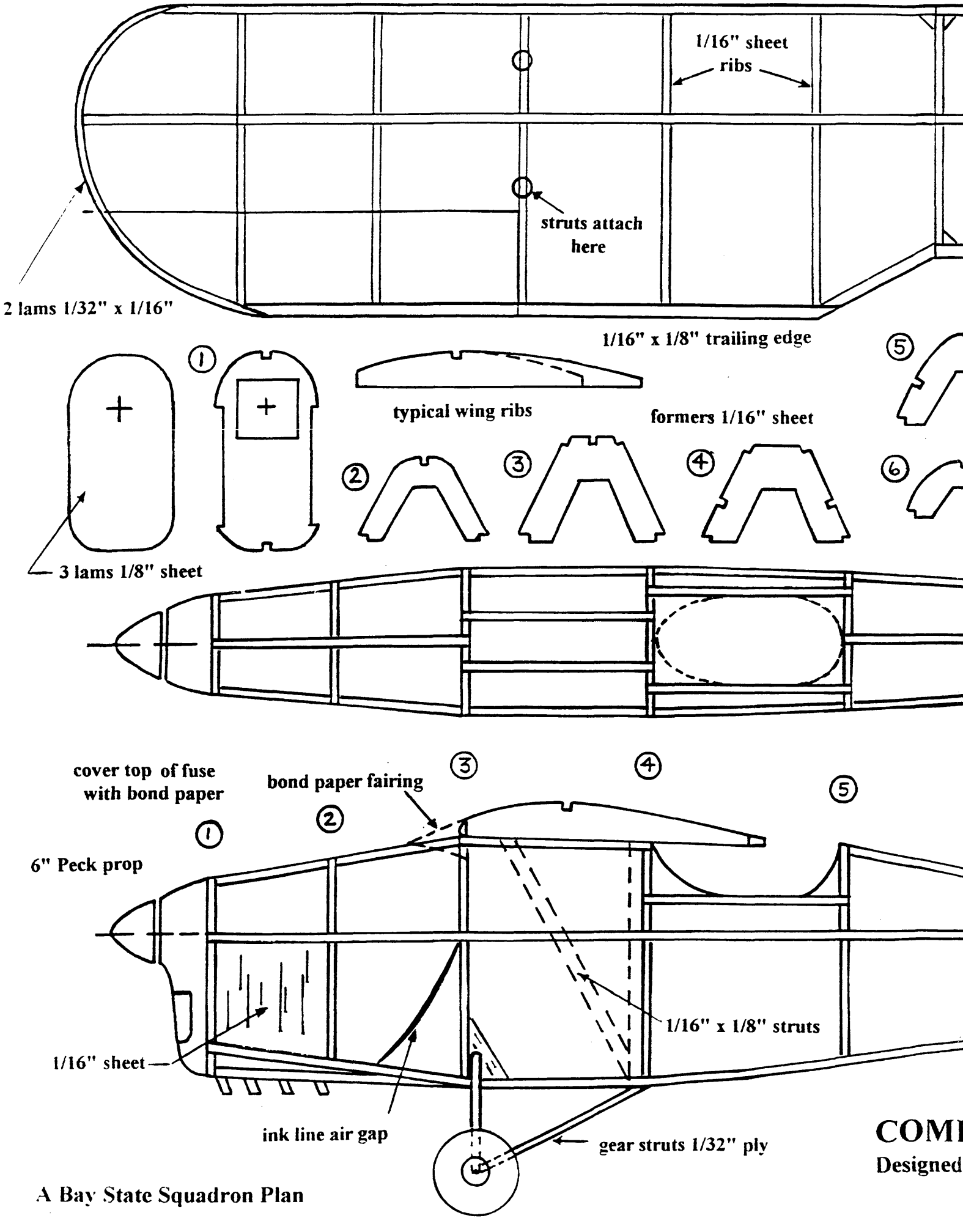
CONTESTANT	201 HL STICK	202 INT STICK	203 FID	204 ROG CABIN	205 MANH CABIN	206 EZB	207 PP	208 LPP	212 HLG	215 BOSTON	218 CAT GLID STND	505 PNUT SCALE	507 AMA SCALE	CHAMP POINTS
49 J McGillivray			100			92.9	84.3	100				90.4	100	567.6
74 Ron Ganser		73.9		52.9	75.4			87.5			76.0	100	98.8	564.5
64 M Thompson	62.1	59.7				84.8		95.0	85.1		100	77.0		563.7
104 L Barr	82.9	82.0	76.9		82.5	88.4		81.3						494.1
110 J Koptonak		65.0			66.4			78.8	64.8		74.8	57.0	72.4	479.2
57 Bernard Hunt		100	89.6			96.0	84.4	91.2						461.2
41 Rob Romash						70.3	86.8	96.4	81.7		80.5			415.7
15 Jim Grant	32.1				100	83.2		90.7		85.9				391.9
45 Rob Eberele	14.3					67.4	78.2	80.9	99.1		99.1	-		339.9
73 John Kagan						69.3	80.3	64.2	52.1	52.2				318.1

From Scale Staffel Newsletter



George Meyer of Corpus Christi, TX has designed this new prop hook. It will cure both "falloff" and "climbup" problems with the rubber. Drawing is by Pres Bruning.



A Bay State Squadron Plan

COMI
Designed

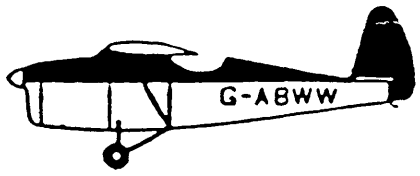
1/16" x 1/8" leading edge

1/16" sq. spar

ink line

5/8" dihedral

2 lams 1/32" x 1/16"



all framework 1/16" sq.

Color Scheme

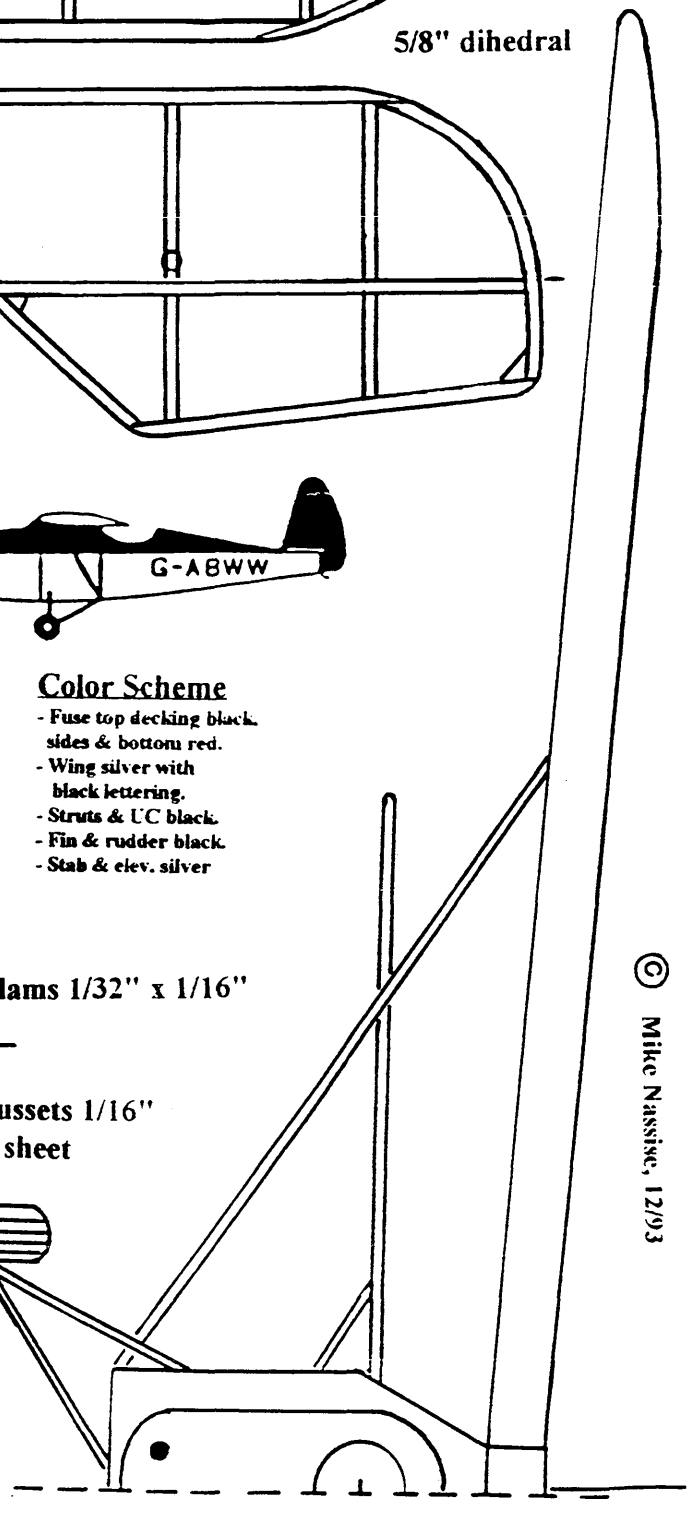
- Fuse top decking black, sides & bottom red.
- Wing silver with black lettering.
- Struts & UC black.
- Fin & rudder black.
- Stab & elev. silver

2 lams 1/32" x 1/16"

1/16" sheet

all gussets 1/16" sheet

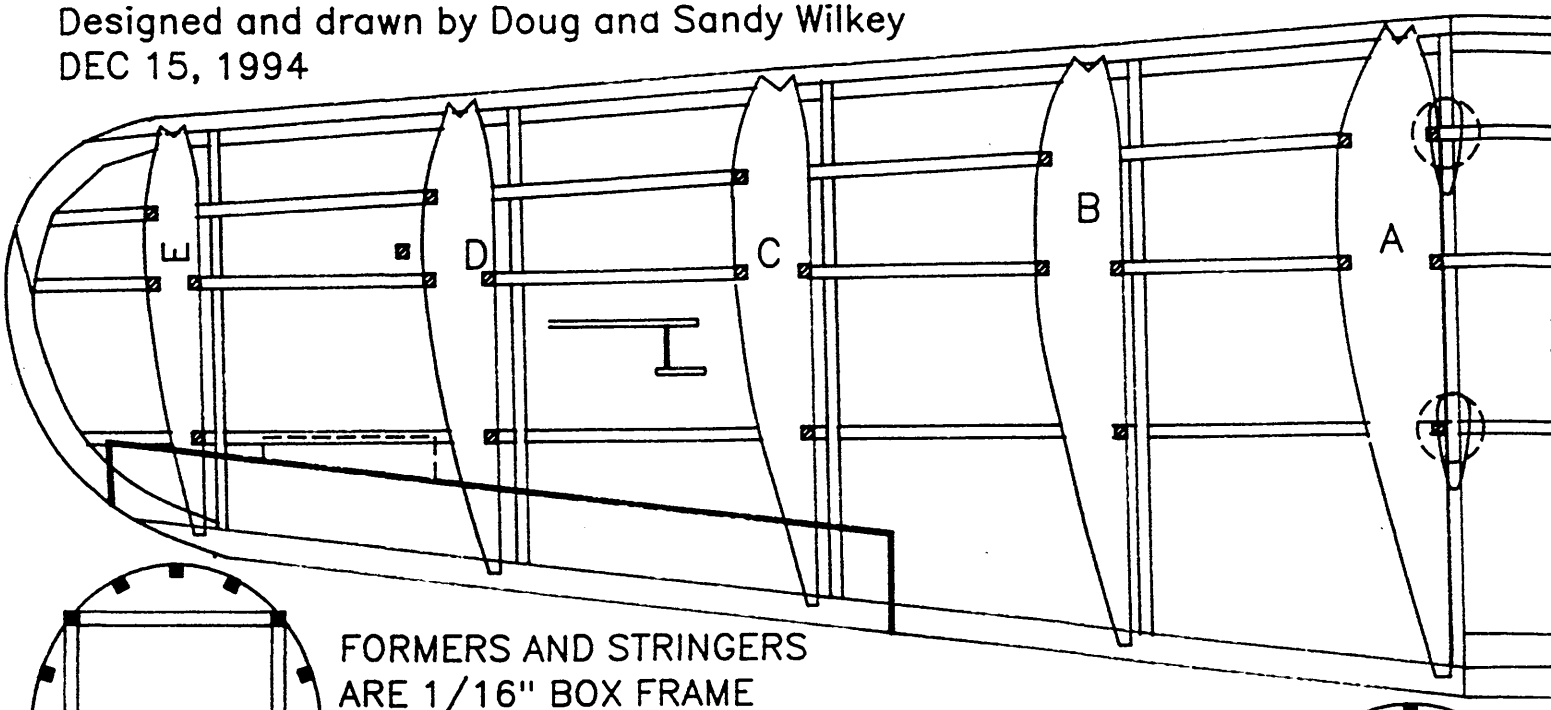
.015 wire shock axle

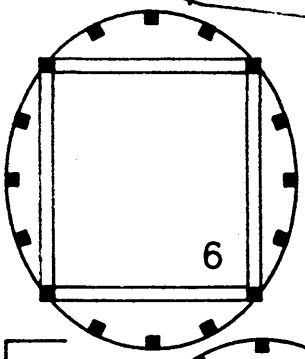


PER SWIFT (Gipsy III Engine)

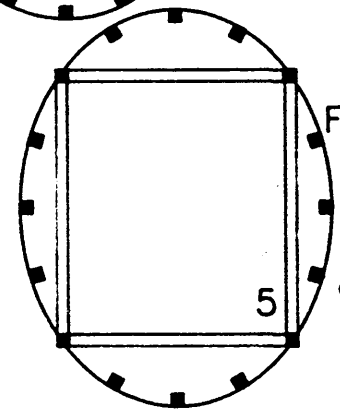
& Drawn by Mike Nassise, 12/93

Designed and drawn by Doug and Sandy Wilkey
DEC 15, 1994

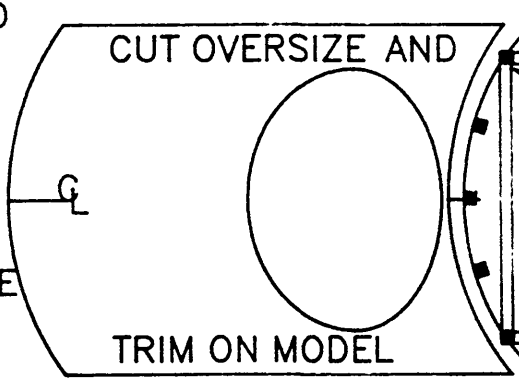


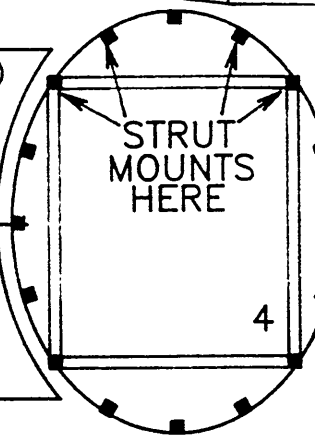


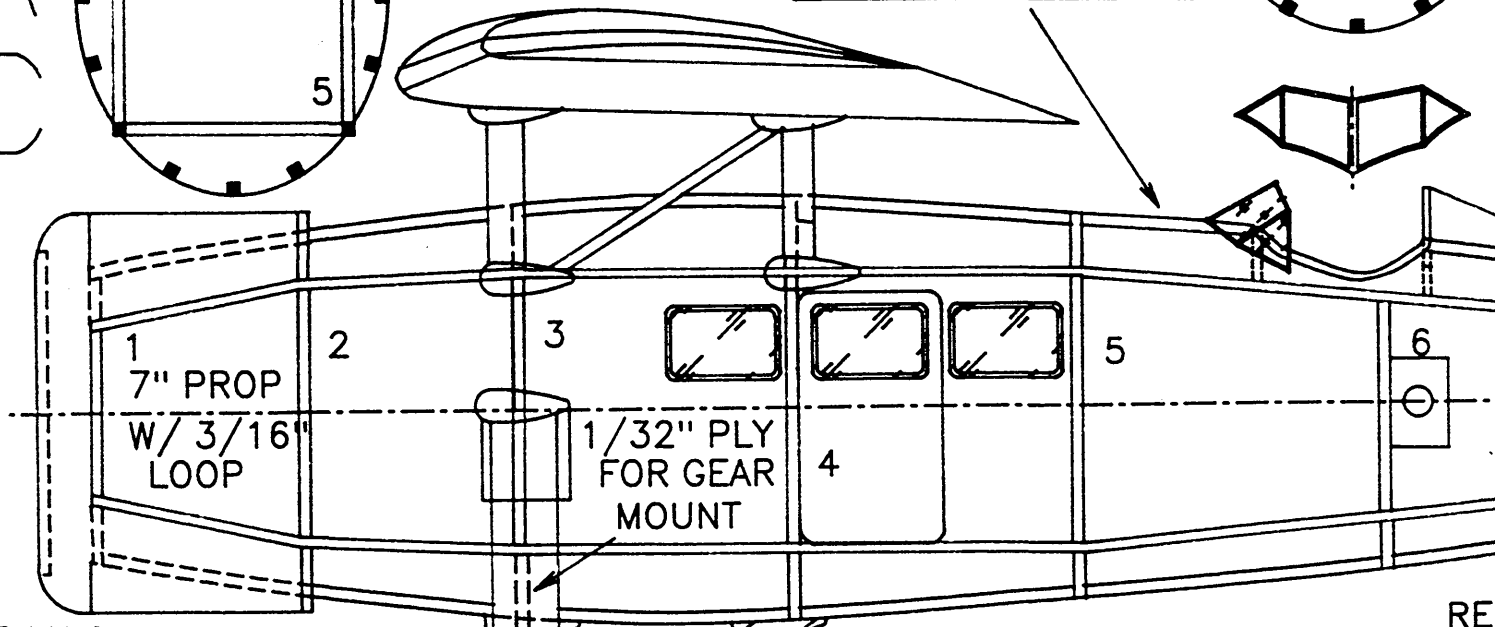
FORMERS AND STRINGERS
ARE 1/16" BOX FRAME
LONGERONS ARE SANDED
TO FORM STRINGERS
AFTER FORMERS ARE
ADDED TO BASIC FRAME

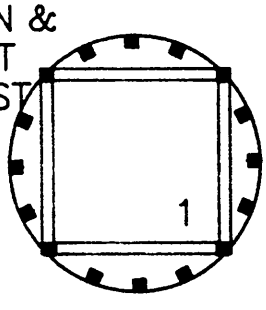


SEE REFERENCE
FOR COLOR SCHEME





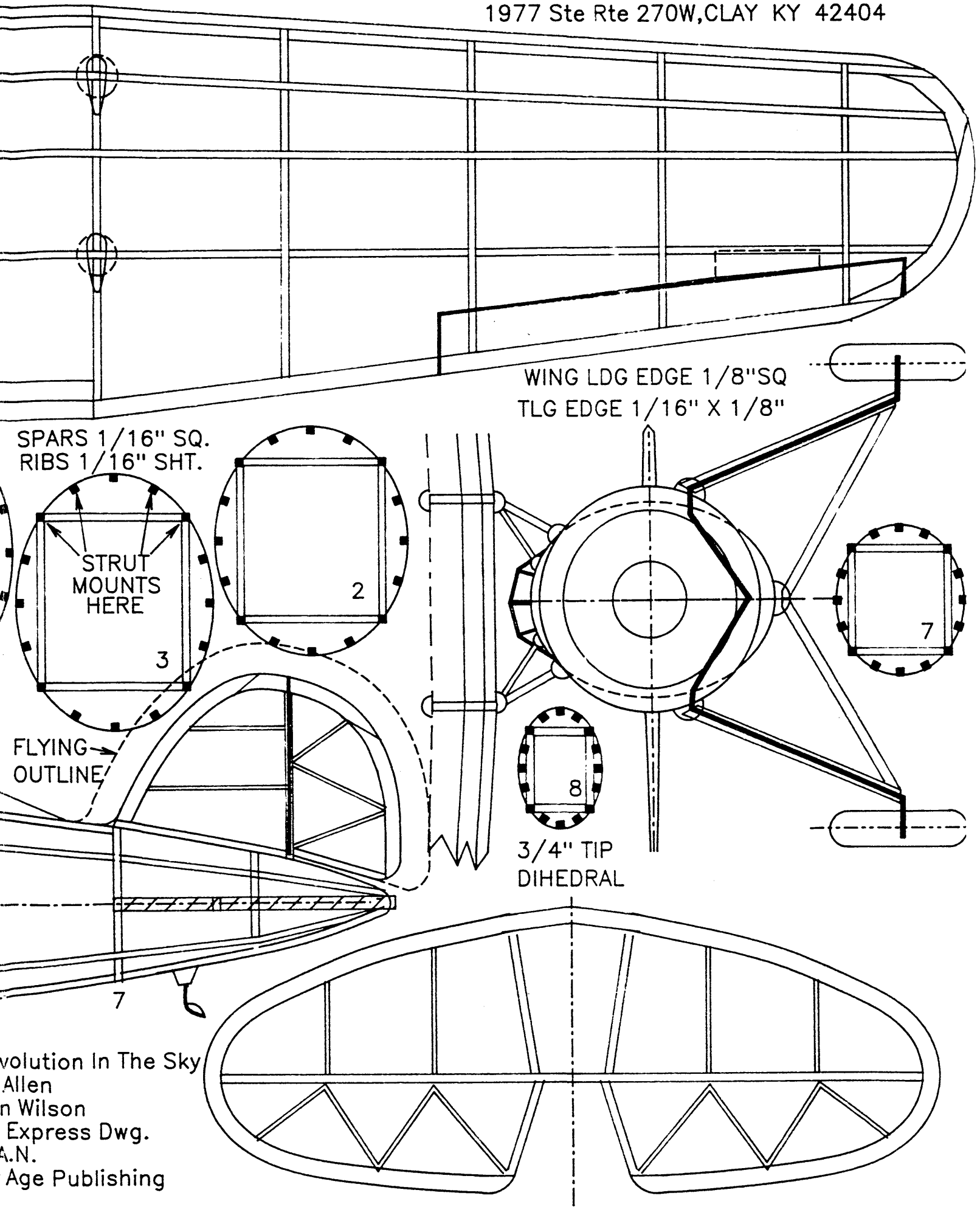




Lockheed Air Express

DESIGN BASED ON
RAY CHEVEDDEN'S
COMET KIT OF A VEGA
DEC. 15. 1934

1977 Ste Rte 270W,CLAY KY 42404



volution In The Sky
Allen
n Wilson
Express Dwg.
A.N.
Age Publishing

F1d Motorstick Construction

by Steve Brown

The motorstick may be the most important single component of an F1d. You can change the wing, even the prop, but it seems that motorstick determines the way the model flies. The stick is also the single heaviest part of the model and is a logical candidate for weight savings

Wood Selection: Wood that is suitable is rare and stringent selection is required. Examine each sheet by laying it on a flat surface. If the sheet isn't perfectly flat remove it from consideration. The grain should be parallel to the edges. Hold the sheet up to a light and look for density variations or heavy streaks. Compare all the sheets to each other to find the stiffest sheets

The most significant variable in the weight of a completed stick is the weight of the raw wood that forms the tube. I eliminate all sheets that weigh more than .0098 oz for a .013" x 1 1/8" x 18" sheet.

The density of a sheet of wood can be misleading since it tells nothing of the uniformity of the grain and resistance to bending. The "density" of the sheet is actually an average of the variations (hopefully few) in density along the length of the sheet. It is rare to find wood less than 3.8 lb. density that is useful.

Use a dial thickness gauge and measure the thickness of the wood. I usually check 7-8 spots at random along the sheet. Take care not to compress the wood as you check it. Look for thin spots in the middle. Boron will not prevent uneven bending if there are thin spots in the middle of the tube.

Rolling the Tube: I use a .250" o.d. rod to form the motorstick. I've tried rod diameters as small as .210" for F1d and, while the weight savings can be significant, I have never had any success with smaller diameters. The resistance of the wood to the twisting force of the rubber torque varies with the density and character of the wood and the diameter of the tube. Small diameter tubes allow tail tilt and wing wash adjustments to change excessively under high torque.

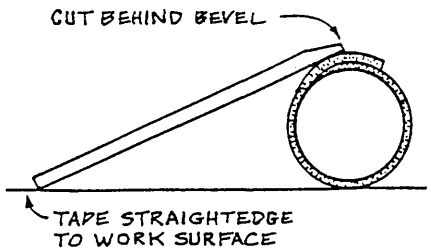
Aluminum arrow shafts (available from archery suppliers) make good forming rods as they are available in 1/64" size increments, have thick walls and are light and easy to handle. Hobby shop tubing, or steel drill rod will also work.

Don't cut the balsa sheet to size before rolling. Trim one edge of the sheet perfectly straight. Position the sheet edge along the edge of your work surface and sand a bevel into the straight edge along the entire 18" length. The bevel should extend about .10" onto the sheet and feather at the edge. Use a waterproof pen (such as a Sharpie) to identify which edge of the sheet has been beveled. Mark both ends.

Soak the sheet in cool water for 15 - 20 minutes. While the wood is soaking cut a 3" X 19" piece of white Japanese tissue. Lay the tissue on the working surface (I use plate glass) and wet the tissue with a soft 1" wide brush. Use the brush to smooth the wrinkles. Place the forming rod along the edge of the tissue and attach it to the rod. Roll the rod about 2/3 revolution so that the paper is evenly attached.

Place the wood on the tissue adjacent to, and almost touching the rod with the waterproof ink marks facing down. Do not attempt to force the sheet into a perfectly parallel position against the rod. The wood will do whatever its internal stresses dictate when it is baked and it isn't possible to force it to be straight. Roll the tube and bake at 200 degrees F for 30 minutes. Remove the rod from the oven after baking and allow to cool to room temperature. Do not unwrap the rod at this time.

Cutting the Joint: Secure both ends of the rod to the work surface with masking tape to prevent rolling. The ink mark at the overlap should be up. Position a wide metal straightedge as shown. Tape the rear edge of the straightedge down to the work surface. Smoothly cut a clean joint using a *new, sharp* razor blade edge, while applying light pressure to the straightedge with the other hand. Make 2 or 3 passes with the blade to be sure that all the layers of paper and wood have been cut through. About the only thing that can go wrong with this method is failing to cut through all the layers.



Carefully unwrap the outer layers of tissue until the wood is exposed. Using a very fine felt-tipped marker (Sakura Pigma .005 or similar) make 4 or 5 small marks across the seam along the length of the tube. These marks can later be aligned and will assist in gluing a straight seam. Remove the wood and the rest of the paper from the rod. Weigh and record the weight of the tube before putting it back on the rod.

Gluing the Seam: I use Ambroid glue thinned 50/50 with acetone for all construction. I plasticize the glue to be used for stick and boom seams with 3-4 drops of TOF plasticizer per ounce of thinned glue. Apply the glue using a 26 gauge needle with the sharp point removed and smoothed, on a plastic syringe.

It is most important that glue be applied *only* on the edges of the wood. Use eye magnification. Non-prescription magnifying eyeglasses work well. The glue seam can vary in weight as much as 100% depending on the thickness and amount of glue applied.

Clamp one end of the metal rod in a vise so that both hands are free. Beginning in the middle of the tube, with the small ink marks aligned, lightly preglue about 1/2" of both edges of the wood at a time. After about 10 seconds apply a second light coat to one side and press the joint together. Minimize pressure from your fingers to the wood, since it is easy to skew the seam or warp the wood from the moisture on your hands. Allow the glue to dry completely, usually 1-2 hours depending on the temperature and humidity, before removing the tube from the rod. Weigh the glued tube and record the weight. Subtract the weight of the unglued tube from the weight of the glued tube and you will know the glue seam weight. Look for a seam weight of about .00035 oz. for an 18" length.

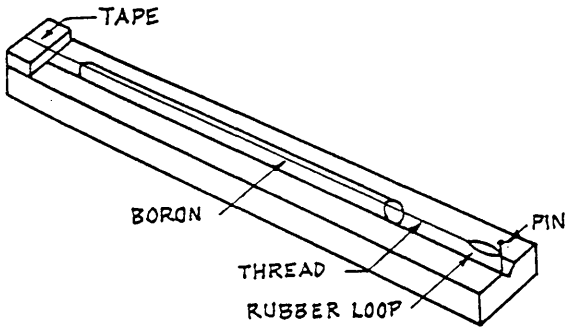
Thrust Bearing, Webs, Rear Hook: I use a Ray Harlan F1d thrust bearing modified to remove excess metal. The stock bearing weighs .00077 oz. Remove metal with a file from the sides and notch the edges of the top of the bearing until it weighs about .0006 oz. Roughen the top of the bearing where it will contact the motorstick. Be careful not to remove too much metal or break off the pigtails. The aluminum cannot be bent more than once without reducing strength.

I use 4.5 lb. C-grain wood, .018-.020" thick for webbing. Orient the grain vertically. A .013" music wire hook will handle torque up to .60 in./oz. without deformation. Whatever hook shape you choose, remember that it is most important that the rubber motor O-ring be easily attached and removed. I reinforce the joint between the rear hook wire and the wood web with one layer of Japanese tissue, but I don't use any CyA because of its weight.

Front End: The glued tube will probably have a slight curve. The location of the seam doesn't matter, just look at the actual curvature. The tube should be oriented to arc "down", that is, to pull against the bracing wire. Mark the top and bottom of the tube 180 degrees apart. Place the tube back on the forming rod and tape both down to your work surface with one of the marks "up". Cut .015" X .750" slots on the top and bottom of the tube, about .25" from the front end. This

will help keep the tube round as you work on it. Cut the slot narrower than the thickness of the web and widen it to an exact fit by lightly sanding it with a small piece of 600 grit sandpaper. Install the front web and glue in place. When dry, slice the front of the tube off and install a .013" cap.

Attaching Boron Filament: Boron filament should be held in a jig that tensions the filament and frees both hands. It is critical that the filaments be glued along their complete length. I use the same plasticized Ambroid glue as for the stick seam, applied using a 26 gauge needle and plastic syringe. Mark the locations for the boron filaments with small dots of ink along the entire length of the tube. Placement of the boron at 12, 3, 6 and 9 o'clock produces the straightest sticks. Unfortunately, locating it at 12 and 6 o'clock causes interference with the stick bracing post. I feel the strength and improved straightness of the tube is worth the extra work required to install the post.

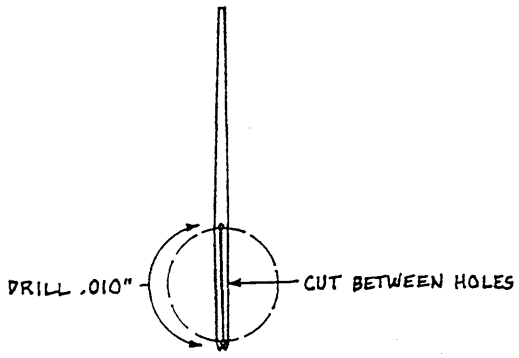


Cut the wood tube to length and place the tube on the forming rod into the jig. Glue the boron filaments, alternating the sides of the tube to equalize stress. Four .004" boron fibers glued on a 14.5" stick will add .0011 to .0012 oz.

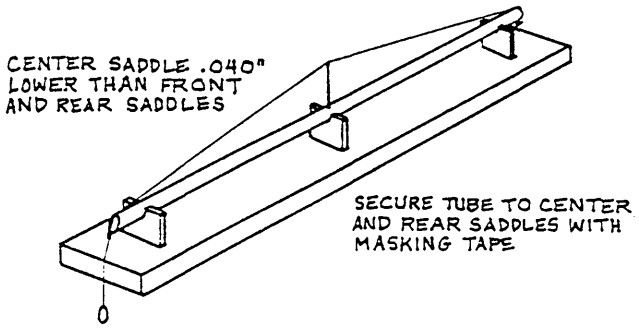
Assembly: Once the boron fibers have been installed lay the tube, on the rod, against a metal straightedge and mark the locations at the rear of the tube that correspond to the top and bottom of the web at the front. Cut two slots about .015" X .60". Remove the tube from the rod. Using a scrap piece of .015" wood inserted in the slots, adjust the slots using 600 grit sandpaper so that both the front and rear webs are in alignment. Cut and insert the previously completed web and hook assembly and glue in place. When the glue is dry slice off the excess wood. Cut the excess .013" wire off so that only about .040" extends above the top of the tube.

Install the thrust bearing with no downthrust and 2 degrees of left thrust. I use Ambroid with no plasticizer for this joint. Coat the bottom of the bearing and the location on the wood tube with thin coats of glue and allow to dry for 10-15 seconds. Apply a second coat of glue to one of the surfaces and place the bearing on the wood. Set the thrustline by placing a *straight* piece of .013" wire about 2.5" long in the bearing using it to adjust the angle of the bearing. This must be done quickly or the joint will be weakened. Once the glue dries apply a second coat in a small "fillet" along the edges of the bearing where it joins the wood.

I use a single 1.75" tall bracing post on all my models. In conjunction with 4 boron filaments it is the strongest bracing method I've tried. Make the center bracing post of 6.5-7.0 lb. "A" grain wood, cut and drilled as shown below. Mark the appropriate locations on the top and bottom of the wood tube and make small holes on either side of the boron with a sharp pin. The holes should be slightly smaller that the bottom diameter of the bracing post. Install the post by lightly "worrying" it into position. The boron filaments will locate themselves in the drilled holes. Be sure that the wood tube stays perfectly round.



Bracing: A bracing jig assures repeatability when tensioning the stick bracing wire. I use .001" tungsten wire from Indoor Model Supply and haven't encountered any breakage. I don't see a need for heavier wire or double strands. Don't use wire that will stretch, such as nichrome.



Place the motorstick in the jig and use small pieces of masking tape with tissue pads to secure the tube at the rear and to pull the tube down to touch the center saddle. Tie the tungsten wire around the stub of the rear hook that protrudes through the top of the stick and glue. Weight the wire with 2 Quarter coins. It is better to have a little too much bow braced into the stick than too little. You can always adjust the tension of the wire at the flying site by *lightly* sanding the top of the bracing post. The goal is to obtain a bracing tension that allows the stick to be straight (no up- or downthrust) at full winds. Don't glue the wire to the top of the post, it is helpful to be able to remove it later.

I use rectangular wing tubes formed by 3 turns of Japanese tissue around a .035" X .064" brass former. I install them by placing the motorstick in a jig that makes round pilot holes at the appropriate angle. The pilot holes are then enlarged with a rectangular toothpick that has been sanded smooth with the corners rounded and the proper width marked.

It isn't possible to cover all the details in an article this short. If I can answer any questions write me at 297 Hartman Ct., San Dimas, CA 91773, or call (909) 394-9685 evenings or weekends.

How To Make a Frog Fly

By Jim Clem

All the data that will be presented in this article comes from the Federation R.O.G. (Javelin XL-extra long) and the USIC FROG (Javelin XS - extra short), but the data should apply to any design.

As with any model, I believe that one of the most important things is to trim the model so that in cruise it will slow down with the nose high, and "get on the step". In order to get the model "on the step", it helps to have the C.G. as far aft as the model will fly consistently. The Javelin (XS) has flown competitively with the C.G. from 88% to 190%. At 190%, it's pure magic, but its consistency is less than one in five!

After the model has been trimmed for cruise, the power pattern needs to be adjusted. I use a 15-25 ft. Dia. Flight circle, and turn the model to the left. No particular reason for the left turn, except for 60 years an indoor model is supposed to turn left! If the power pattern does not work out, use the tried and true mini-stick method: put up-thrust in it till it stalls, and take out the stall with left thrust until you get a nice steep nose-up spiral climb. Be sure and use 1/4 motors because it saves an immense amount of time.

Another important item is the prop. I have had great success with the black Tern 6" plastic prop. The blades are hand-scraped with a very sharp fish-filleting knife and the hub is thinned with a sanding drum on a Dremel Moto tool, then smoothed with knife and sandpaper. When finished, the prop should weigh 1.1 to 1.3 gm. The blade shape for the Tern prop is left stock. The blades have a 35 deg. Angle at a 2" radium for a pitch of 8.8 in. The other prop that I use is the Dave Aronstein-type prop. It is made from a Peck Polymers 9-12" P-30 prop, cut down to 6" diameter. The blade shape is Dave's, but does not use the tip plates. It also weighs from 1.1 to 1.3 gm., and the pitch is the same 8.8 in.

Here are the specifications for the two FROG models:

USIC FROG JAVELIN - XS (EXTRA SHORT)

Total Weight	3.14 GM
Prop	6" (Dave Aronstein-type made from a Peck 9-1/2" P-30 prop) Pitch 8.8" (35 deg. @2" R.)
Prop Wt.	1.13 gm
Motor	.046" x .044 x 40" Tan II (6/93) Torque - .31 in-oz. 6660 turns - 1140 turns remaining - 619 R .P.M.

This model won at the 1994 USIC in Johnson City, with a flight of 8:55. To my knowledge, this is the top time ever made with a USIC FROG.

FEDERATION R.O.G. JAVELIN - XL (EXTRA LONG)

Total Weight	3.28 gm.
Prop	6" black plastic Tern - 8.8 in. Pitch (35 deg. @ 2"R) stock blade shape.
Prop Wt.	1.25 gm.
Motor	.050" x .040" x 60" TAN I Torque - .5 in-oz 7200 turns - 200 turns remaining - 722 R.P.M.

This model made a flight of 9.41 at Lakehurst on Sept. 3, 1990. To my

knowledge, this is the top time ever made with a Federation R.O.G.

To summarize:

1. Adjust the model in cruise until it is nose-up and "on the step".
2. Adjust the cruise turn with rudder to fit the flying site (I use 15-25 ft. dia.)
3. Adjust the power pattern with the thrust line.
4. Make up a motor from TAN II, comparable to those listed, and go out and break 10 minutes. IT CAN BE DONE!

****

FEDERATION R. O. G. JAVELIN - XL (EXTRA LONG)

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Prop Wt.	1.25 gm.
Motor	.050" x .040" x 60" Tan I
	Torque - .5 in-oz
	7200 turns - 200 turns remaining - 722 R.P.M.

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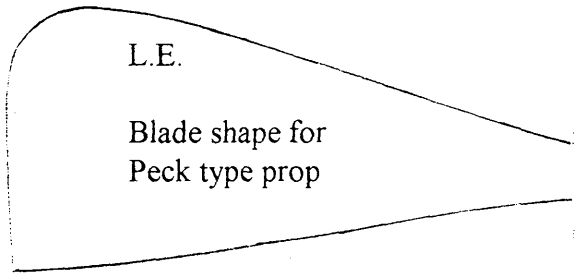
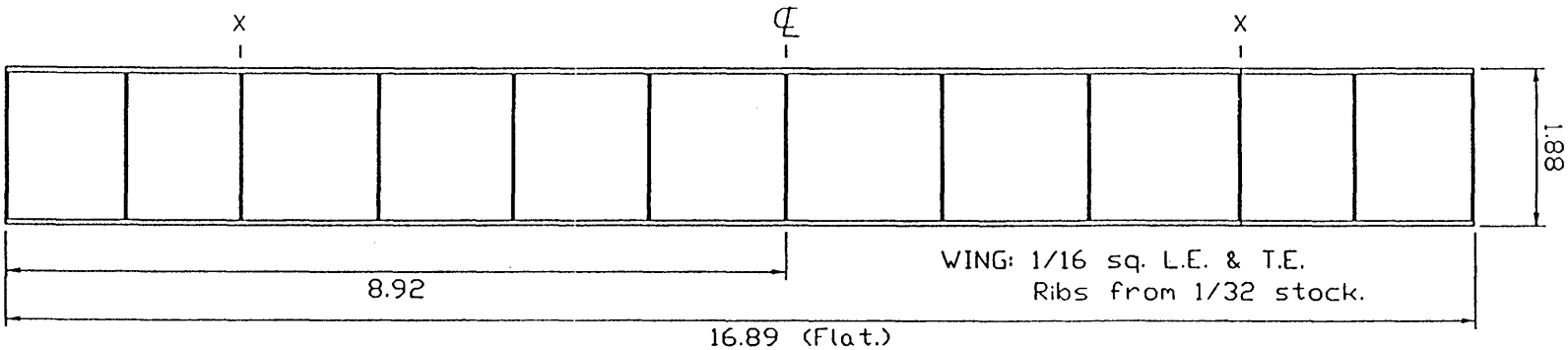




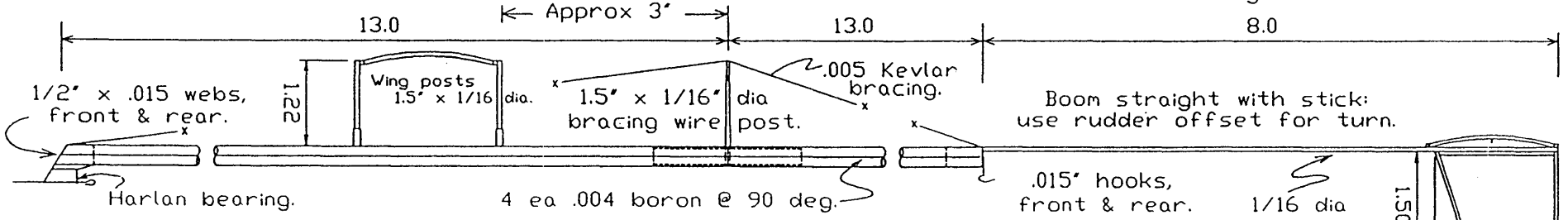
Tip dihedral only!

1.5", each tip.

C.G. approx 1 1/4" aft of rear wing post.

16.0 projected with dihedral.
Area = 30 sq. in.

.050 x .040 x 60" tan FAI - 6250 turns.
6" TERN plastic prop.
Covering: Harlan UltraFilm.

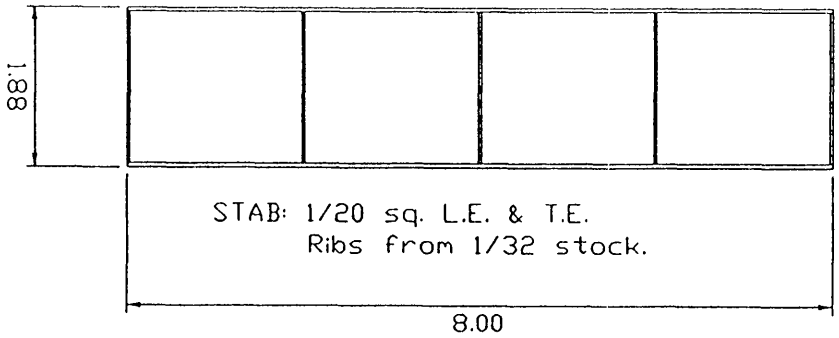


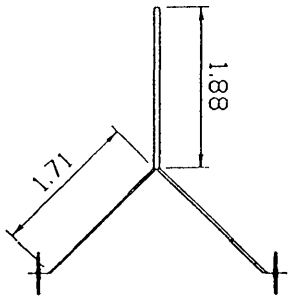
Wing & stab airfoil template.

Make 2 motor stick blanks:
19/64 x .018 x 18" from 4 - 41/2 lb stock.
Tubular stick 9/32 dia x 26" long.
(Join with 2" insert to make one 26" stick.)

Weights:

Stick	1.18 g
Prop	1.25 g
Wing	0.52 g
Tail & Boom	0.21 g
Gear	0.12 g
Total	3.28 g





Landing gear: 1/16 dia frame.
1/2" dia wheels on .010 dia music wire axles.

JAVELIN - XL

(Extra Long !!)

A Federation R.O.G.

by Jim Clem.

1st place USIC 1990 (7:51).

Drawn 8/8/90 - M.J.Whittemore, Jr.

CHILTON'S CORNER
By Stan Chilton

MICROFILM TECHNIQUES

Over many years other modelers have asked me how I get the solid color silver and straw brown sheets of microfilm. I used to think anyone could produce this kind of film but I've learned if you don't have the right equipment, tank and frames, pouring and lifting satisfactory microfilm sheets can be quite frustrating. Following is my procedure.

EQUIPMENT:

WATER TANK: The first requirement is a proper size water tank, or pan. I built one out of a 4 x 8 ft. .040 thick aluminum sheet, or rather I took the sheet to a sheet metal fabricator and had him make a tank 4" deep by 3' 4" wide and 7' long. The top edges are folded over and the corners are overlapped and riveted, making a quite water tight assembly. This size tank is larger than needed or useable but I tailor the width by means of a 2" x 2" "L" angle aluminum just shy of 7' long so it will fit snugly lengthwise inside the tank so the width can be adjusted to restrict the spread of the microfilm.

A tank larger than 2½ x 7 ft. will allow the poured film solution to spread too far and you will not be able to pour a large enough quantity of solution to get a sheet thick enough to pick up.

I think a tank size of 30" x 72" x 2" deep is just about optimum and should be able to handle sheets up to 12" x 48".

The Cadillac of all tanks would be made of .032 to .040" thick stainless steel with welded corners, and a drain plug in one corner.

Some modelers use a 1" x 4" wood framework with a plastic sheet liner. This should work just as well as my aluminum tank, and take less storage space.

MICROFILM FRAMES: I used to use balsa wood frames of about every dimension, whatever I had on hand. But if you're serious about microfilm model flying take the time to build some frames that will assist you in picking up the film colors you want.

Buy some clear 1" thick white pine, any width and strip it into strips about .66" wide. Since the 1" white pine is really only .625 thick your strips are .625" x .66".

I use 3 sizes of frames: (all outside dimensions) 10x30, 12x36, and 12x48.

The 12" outside width produces a sheet of film wide enough to cover a 9.75" chord wing.

Assemble the frames using Titebond glue and small gussets in the corners. Apply one coat of sanding sealer, sand smooth then spray paint with whatever color of spray paint in cans you have on hand.

There is a reason for building these sturdy, heavy frames. If you've ever picked up a sheet of film intact, then had it go splat and disappear, it probably shrunk too tight on the frame. The white pine frames press down on the film sheet on the water and stretch it slightly so you won't lose it after getting it picked up.

An additional benefit is the extra

rigidity. Thin sheets are hard to pick up and retain with flexible frames.

I make up enough frames so that I can make up a 3 to 4 year supply of microfilm sheets.

But if you already have balsa frames on hand they are useable. To get the balsa frames heavy enough to press down on the poured film I lay a 15" metal drafting machine scale (ruler) across the center of the frame, leave this extra weight on the frame for about 5 minutes to stretch the film before attempting to lift the sheet off the water.

MICROFILM: I have used Erv Rodemsky's various formulas of microfilm and the only one I didn't like was his GP83M and S. I think his current batch is GP-90 which is the easiest of all to pick up. I really liked his GP-84-2P and still use it.

I have also used Micro-X Red Label and Lew Gitlow's IMS film. Both these films produce satisfactory sheets, dry and stable. Use whatever product you have the most confidence in. I prefer Erv's batches because they work well for me and I know more about what's in them.

Very important. Any microfilm you purchase that is bottled in plastic bottles should be transferred to glass bottles immediately. Use glass bottles with an aluminum gasket on the lid. Avoid the lids with paper or waxed liners for gaskets. The solvents in the microfilm will escape through the plastic bottles. Very rarely you will need to thin the mixture with acetone but go very slow, thinning only as much as absolutely necessary.

APPLICATORS: I apply the microfilm solution to the water differently than anyone I know. But it's the main reason I can pour solid color sheets in the color and thickness I desire. It also wastes very little microfilm mixture.

I use a glass 5cc hypodermic syringe with a large 2½" long #12 needle. I'd use a larger needle if I could find one.

There are other methods of dispensing the microfilm fluid onto the water. Erv Rodemsky uses a short piece of 3/16 or 1/8 brass tubing, filling it with the precise amount of film desired, letting gravity flow the film out onto the water.

An added benefit is if the liquid film mixture won't flow evenly out of the tube, it is too thick.

Bernard Hunt uses the same system but with an 8" long graduated approximately ¼" diameter glass tubing and he varies the orifice by heating and forming the size of the orifice to produce the desired outflow (about .050" diameter). He recently picked up solid silver sheets and 6 out of 7 attempts at gold straw brown colors.

THE WATER: I used to purchase 3 - 5 gallon containers of distilled water, and still do occasionally, depending on my results with tap water. I bought a charcoal and sediment filter and use these to filter the tap water into the microfilm tank.

Erv Rodemsky uses distilled water and saves it for reuse. The distilled water definitely will not leave mineral deposit specks on the film. If the filtered tap water leaves any residue on the first few sheets of film, I immediately switch back to distilled water. Our tap water in Wichita comes

from 3 different sources, a nearby lake, drilled wells and underground aqueous beds about 90 miles away. Depending on the particular source, sometimes the filtered tap water works well and sometimes it doesn't. But it's always cheaper than distilled water. The water must be clean and potable, that is you'd drink it.

Be sure the tank is hospital clean. The microfilm solution will not spread well on contaminated water.

TIMING THE POUR: About 25 years ago I was pouring microfilm and having no luck whatsoever picking up almost any kind of sheet. I decided to call it quits for the evening and came upstairs from my model shop. It was raining outside and I just happened to check the barometer. It was 29.40.

About 3 or 4 days later it was cold and clear, barometer 30.30 and I refilled the water tank. The next morning I lifted 15 sheets out of 15 poured, all in silver and gold, some 12 x 48 sheets.

Since then I wait to produce microfilm until the barometer is at least 30.20 or higher. This condition is normally associated with dryer air, which also may be helping. There seems to be more high pressure conditions in winter than summer.

A couple of days before I pour, I disconnect the humidifier from our house furnace, helping keep the air dryer.

PRODUCING THE FILM: Prior to producing the film you should have on hand sufficient frames, the tank, aluminum divider bar, water, hypodermic syringe and of course, the microfilm solution.

Fill the tank 1½" deep with water. Let stand 6 to 8 hours, or overnight to stabilize in temperature evenness. Make sure the atmospheric pressure stays high.

For the amount of film you can dispense on the water through the #12 needle of the syringe, position the divider "L" angle aluminum so your effective water width is 30", times the length of your tank. Different film dispensing methods may require more or less water width, depending on the total amount of film solution laid on the water. Absolutely, the amount of film on the surface area of the water determines the thickness of the film, provided the water surface area isn't too large, and the liquid film has been dispensed evenly on the water.

Fill the syringe with about 2.7 cc's of film. Turn upside down and set for a few minutes for the microscopic bubbles in the film to rise. For a holder, I epoxied a 2 oz. glass jar's base to a 5"x5"x⅜" base of balsa. I cut a piece of foam rubber and inserted it into the jar so the plunger end of the syringe rests on the foam and the syringe flange resets on the top of the bottle. (Syringe is still upside down). The plunger must be supported or it will fall down.

Grab a soft hand tissue and cover the needle end of the syringe and top off the film to 2.5cc's of solution.

Standing beside the long dimension of the tank start dispensing the film solution at the left end of the tank and run a stream down the center, hopefully running out of film at the same time you reach the other end of the tank.

During the pour, the syringe will be held at about a 30° angle to the water and

the tip of the needle, filed square, held as close to the water as you can without dipping it into the water.

Just enough pressure is exerted on the plunger to let the microfilm solution escape the syringe, evenly and smoothly.

If the film on the water has circular stripes, the ejected solution has been forced under the water. Try again with less plunger pressure.

Dispensing the film solution is a matter of feel and patience. You must use all the film each try and you must lay the film entirely end of tank to opposite end of tank, at the same time keeping an even dispersion of the film. Keep the same speed traversing the tank every time.

I generally get in the groove of evenly dispensing the film within 4 or 5 trial runs. Even if the laid down solution isn't the exact color and thickness I want, part of it may be, so use one of the smaller frames.

When you are comfortable dispensing the film evenly and accurately you can adjust the amount of film in the syringe to get the thickness you want. 2.5 to 2.6 cc's gives me silver, 2.8 or 2.9 cc's gives me very dark blue. 2.7 cc's is straw brown.

After I've completed a satisfactory pour I fill the syringe for the next pour, set it in the jar holder upside down, getting ready for the next pour.

Leaving the previously poured film on the water, I take whatever size frame I want outdoors and spray it lightly with 3M 77 contact spray or 3M 75 with a fine spray mist nozzle.

If ½ the film on the water is silver and the other ½ is blue or off color, I'll use the 10x30" frame and place it on the desired silver end of the water. If the poured film is of even color I'll use the 12x36 frame.

Place the sprayed frame gently on the film. Next tear off the excess film outside the frame and remove this debris from the water. Wait about 5 minutes then lift the film and frame off the water. Hold very still just above the water with one corner down to allow the water to drain off. This will take abut 30 seconds, and when mostly dry, carefully set the frame vertically at the other side of the room. The film and frames must be absolutely dry before putting in the storage boxes.

Lifting the film off the water is a technique all in itself. I have heard of some who lift off one end and slide the film and frame lengthwise out of the water. I don't think you can lift silver sheets this way. Lew Gitlow says you need help from the "Lift Angel" to get off good light sheets.

I grasp the frame by the ends and pull the frame slowly close to me before I start the actual lift. Then raising the long edge farthest away from me, and a little side to side movement, I move the raised edge further from me and rotate this edge to vertical by the time the trailing edge is leaving the water. Gentle is the name of this game. The most critical times of the lift is the first movement off the water and the free film/frame that is just off the water. The lift movement must be all in one smooth motion -- if you stop or hesitate during the lift all is generally lost.

Ron Higgs lifts the edge nearest him and sometimes gently blows under the film

helping it lift off the water. Here again there are slightly different techniques achieving the same result.

After you've set the finished film/frame to one side, the syringe will be ready to pour the next sheet. But before this, examine the water surface and clean it of any residue left from producing the previous sheet.

I use either silver or straw brown for F1D wings, solid silver for stabs and blue for props. Don't worry about the strength of the silver and straw brown film if you are using Rodemsky's film. It is plenty strong enough.

There's probably not much weight saving between gold and blue film. But I know a gold patch on gold film is blue, so gold must be ½ as thick as blue.

Producing really light solid color film is not easy but is certainly worth it when you hear the nice comments from your competitors about the good looking film. And it probably is lighter.

STORING THE FINISHED FILM: If you have made microfilm previously you probably already have a favorite way to store the finished frames of microfilm.

If you do not have a favorite storage system -- here's mine.

From a wholesale florist I purchased about 8 or 9 large cardboard cartons with shallow top lids. The boxes measure 44½" long, 12" deep and 22" wide. The lid or top fits over the box with 3" overlapping sides. The florist charged me $4 to $7 each. I had to build my own 50" long box to store the 48" long sheets.

For storage the sheets are laid into the box flat with ⅜ x ⅜ x 14" balsa spacers, 2 per sheet. Stacked thusly each box will hold about a dozen frames.

Each box is vented to allow free air circulation around the film, but not much. Just under the top lid on each side cut a vent strip about ¾"x8" and cut the same size strips near the bottom on each end, for a total of 4 vents per storage box.

The cardboard boxes can then be stacked ceiling high in one corner of your model workshop, but preferable in another room free of sawdust, etc.

1995 International Mini-Stick Postal Contest Results

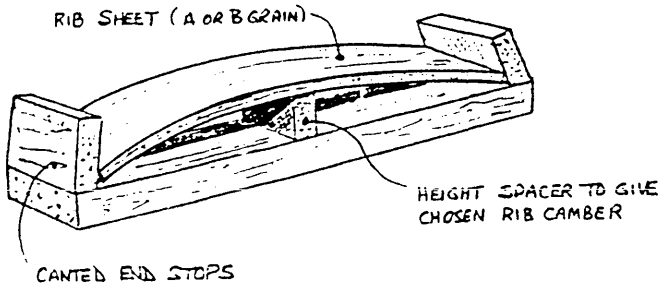
Name	Country	Ceiling Height in Feet	Best Time in Seconds	Corrected Time	Place Overall & Class
W Van Gorder	U.S.A.	23.25	648	1044.99	OVERALL CHAMP
L. Coslick	U.S.A.	8.96	460	946.59	1st PlACE - INT'L
L. Mzik	U.S.A.	20.00	504	847.85	2nd PLACE - INT'L
T. Yatabe	Japan	29.52	552	830.13	3rd PLACE - INT'L
J. F. Frugoli	France	8.20	391	820.68	
J. Clem	U.S.A.	23.00	500	808.81	
M. Vanlil	U.S.A.	10.92	408	801.97	
R. Eberle	U.S.A.	20.00	476	800.74	
M. Thomas	Canada	17.75	448	778.53	
K. Hara	Japan	25.94	498	778.12	
J. O'Donnell	U.K.	9.00	378	777.07	1st PLACE - U. K.
S. Nonaka	Japan	29.52	515	774.49	
K. Kihara	Japan	29.52	508	763.96	
Z. Fujiwara	Japan	29.52	502	754.94	
D. Belieff	U.S.A.	18.60	438	751.60	
S. Nonaka	Japan	25.94	478	745.87	
Y. Sugi	Japan	29.52	481	723.35	
T. Vallee	U.S.A.	18.60	421	722.43	
A. Abell	U.K.	7.67	339	722.00	2nd PLACE - U. K.
K Hashimoto	Japan	29.52	479	720.35	
B. Tenny	U.S.A.	23.00	439	710.13	
Y Takeuchi	Japan	25.94	450	703.12	
D Slusarezyk	U.S.A.	30.00	458	685.44	
Y. Takeuchi	Japan	24.25	423	673.96	

S. Miura	Japan	29.52	441	663.20	
D. Yates	U..K.	9.00	322	661.95	3rd PLACE - U. K.
S. Tamaj	Japan	19.85	242	407.35	
R. Vaucelle	Argentina	22.00	243	398.06	
E. Shiobe	Japan	11.21	201	392.59	
R. Ljubomir	Slovinia	29.20	248	374.18	
H. Anno	Japan	11.21	190	371.11	
T. Ashikawa	Japan	11.21	182	355.48	
N. Nitta	Japan	11.21	181	353.53	
T. Norigoe	Japan	11.21	180	351.57	
J Williamson	U.S.A.	30.00	232	347.21	
S. Vojislav	Slovinia	22.00	227	342.49	
S. Weckerly	U.S.A.	30.00	225	336.73	
M. Slobodan	Slovinia	29.20	219	330.42	
A. Horacio	Argentina	22.00	195	319.43	
T. Uezono	Japan	11.21	145	283.21	
M Matsubara	Japan	11.21	139	271.49	
K. Vacing	Canada	18.00	137	237.18	
S. Nemanja	Slovinia	29.20	135	203.69	
S. Paunovic	Slovinia	29.20	117	176.53	
L. Danijel	Slovinia	29.20	97	146.35	
A. Chisolm	Canada	18.00	53	91.76	
V. Ousan	Slovinia	29.20	20	30.18	

MAKING RIBS

by Brian Kenny (GB)

I have recently been using moulded ribs for all my EZB/F1D wings and built-up props. A sketch of the type of jig I use is attached for your interest.



Brian Kenny. 8/9/93.

The end locators and the central transverse "height" spacer are superglued to the base (all from balsa wood). The height spacer of course determines the % camber of the rib and hence the same height of spacer ensures the same maximum rib height for both chordwise and diagonal ribs if these are used on the same wing.

I trim the length of sheet from which the ribs are to be sliced, whilst it is dry, and by trial and error till, when spring into place, it fits snugly and is held securely by the angled end pieces. The rib sheet is then soaked in hot water for ten minutes, replaced in the jig and dried in a low heat oven (or if I am in a rush as usual, I use a hair drier to dry the sheet + set the curvature). A "Laurie Barr" type of slicer is then used to slice off the required number of ribs from the edge of the permanently curved "rib sheet". Since the grain is along the rib, the bending stiffness of these ribs is optimised for their depth + thickness. So far they have not lost curvature in the sometimes damp Cardington conditions and you don't have to use C-grain wood.

1996 International Mini-Stick Postal Contest

The St. Louis Thermaleers invite all indoor flyers to take part in the 1996 International Mini-Stick Postal Contest to be held over the winter period. The rules for the contest will be as follows:

1. The contest is open to Indoor models that comply with the Living Room/Mini-Stick rules.

2. Contest flights are to be made between 1 Jan., 1996 and 31 Mar., 1996.

3. Any number of flights can be made at any number of sites.

4. All contest flights to be timed by someone other than the flyer.

5. All contest flights to be recorded on an official Results Form. (Included in this issue. Copies can be made.)

6. Best single flight time wins, after the flight time has been corrected for different ceiling heights. Ceiling height to be measured as per the FAI, but with a 5 metre diameter circle. The correction factor is 627 divided by (167 plus 46 times the square root of the ceiling height in feet). The time in seconds will be multiplied by this to give the corrected time.

7. Prizes will be awarded dependent on the number of contestants.

8. All Results Forms to be returned no later than 10 April, 1996 to the address below:

9. Entry is <u>free</u> to all contestants.

10. Results will be sent if a S.A.S.E. is included with the Results form.

Send your results to:

Larry Coslick
4202 Valley Crest Hills Drive
St. Louis, Missouri 63128

<u>MINI-STICK MODEL RULES</u>

Monoplane, max span	7.0 in.
Max Wing Chord	2.5 in.
Stick Length	5.0 in.
Max Model Length (less prop)	10.0 in.
Stab (Tail) Area	Max = 50% of Wing
Covering	Plastic/Paper. <u>NO</u> microfilm
Propeller	Wood Prop, 7" dia.max.
Minimum Weight	(0.43 gms)0.015 ounces

<u>Flying</u>

Steering	4 Ten Second Steers*
Attempt	15 Seconds or more*

*Special rules for very small rooms only! (Living Room flying.)

Indoor Postal Contest Results Form

Club Name_____

Date of Contest____/____/____ Site Name_____

Ceiling Height_____Feet

Contestant Name SMAE No. Age (if Jr.)	Address	Time in Seconds	Timer Initials	Leave Blank
		1.		
#		2.		
		3.		
		4.		
		5.		
		1.		
#		2.		
		3.		
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Issue #85 September 1995

FOR SALE

We have several extra copies of the program books from the 1995 USIC. This book contains about 20 drawings of winning indoor designs, many with sufficient detail to permit easy construction.

Price $7.00 - USA $10.00 - Foreign

INDOOR NEWS AND VIEWS (INAV)

Published 4-6 times/year, depending on availability of material.

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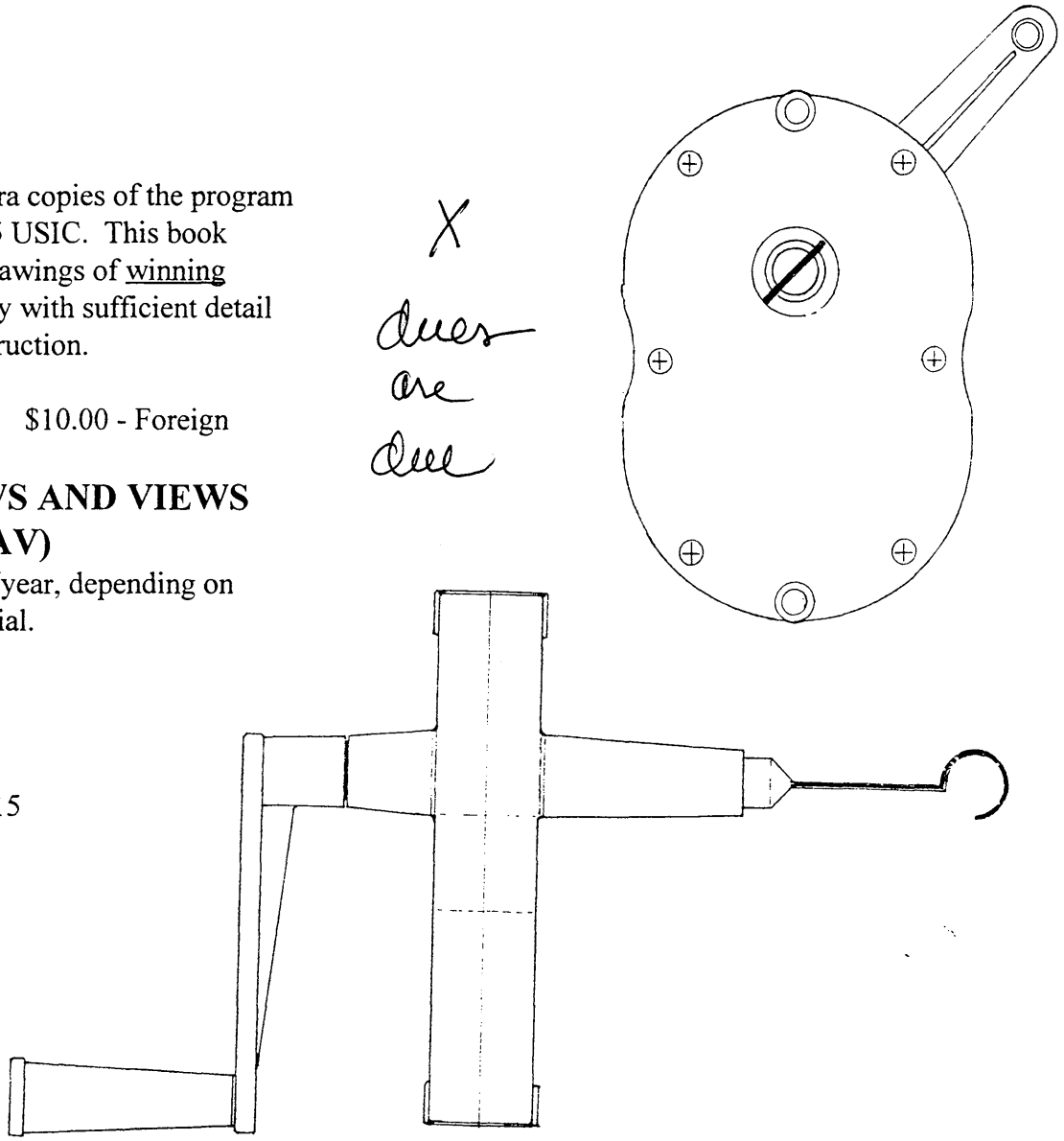


Indoor Winders

These winders are available in 5:1 10:1 and 15:1. All three winders will wind ¼" loop of rubber to breaking point, so they should cover all aspects of indoor flying. There is a ball bearing thrust race built in and the winding hook is retractable. There are two mounting holes, one top one bottom, so that counters and bench clips can be securely fixed to the winder. The cost is £9.00, which includes world wide post. Payment can be made by Eurocheque or International Money Order made out in £ sterling to John Tipper, 23 Green Lane, Chichester, West Sussex, PO19 4NS, England. U.S.A. $ accepted - please send $15.
(The drawing is full size)

Yours sincerely

John

AMA RECORD UPDATE

_____,1995	Tom Vallee	Open
Cat I Intermediate Stick		21:56
July 2, 1995	Ray Harlan	Open
Cat IV Ornithopter		19:44
July 16, 1995	Jake Palmer	Sr.
Cat IV PennyPlane		15:09
July 17, 1995	Steve Brown	Open
Cat IV FID		49:23
Aug 5, 1995	Jim Clem	Open
Cat I Limited PennyPlane		11:48
Aug 5, 1995	Stan Chilton	Open
Cat I Intermediate Stick		30:40
Aug 6, 1995	Jim Clem	Open
Cat I PennyPlane		13:45
Aug 26, 1995	Jim Grant	Open
Cat IV Limited Penny Plane		18:00
Sept. 2, 1995 Roy White		Open
Cat IV Ornithopter		21:44
Sept. 2, 1995 Richard Doig		Open
Cat IV FID		50:41
Sept. 2, 1995 Larry Coslick		Open
Cat IV R.O.G. Stick		22:49
Sept. 3, 1995 Larry Coslick		Open
Cat IV Intermediate Stick		41:48
Sept 11, 1995 Larry Coslick		Open
Cat II Intermediate Stick		31:37

ATTENTION OVERSEAS FLIERS

INAV is interested in publishing all new indoor records for your respective countries. Please include date, flier's name, ceiling height, type of model and time. Send information to:

Roy White
1025 Cedar Street
Catawissa, MO 63015

Cover by Rob Eberle

ATTENTION

Dr. Vernon Hacker advises us that Bill Thornbro of Model Aviation magazine would very much like to have pictures of indoor activity. He would especially like to have some pictures that he could use as a cover showing a microfilm in all its iridescent glory. Please send to:

Bill Thornbro
Model Aviation
5151 East Memorial Drive
Muncie, Indiana 47302

1995 USIC SCORING CLARIFICATION

The scoring at a contest is sometimes controversial. Limited Penny Plane was one of these occasions. Jack McGillivray won the **OPEN LPP** contest with 15:29. Vladimar Linardic won the **JR/SR LPP** contest with 15:56.

Although Vladimar's winning time was the highest score, he was competing in as a Senior and the Open Championship points were tabulated, using Jack's time of 15:29. The confusion resulted because Vladimar's times were recorded on the score sheet for open flyers.

35cm Stick

By Tom Sova (see plan)

This is the 3-View of my 35cm stick. The model is my first 35cm and was built about 3 weeks before the Johnson City contest. Two props with identical outlines were built. The original was a 12.25" diameter, 18" pitch, In building the second prop, I rotated the prop shaft on the prop block to increase the pitch. The resulting prop had a pitch of 26" and was the prop I used. The model flies nicely with the high pitch prop, but is a bit tricky at high torque. The next prop will be somewhere in between, probably a 12:25 diameter 24" pitch.

The Columbia Cruiser

By Jim Grant (see plan)

This Manhattan cabin model is so named because I first flew this event in the low library rotunda at Columbia University. The model is conventional in construction with assembly achieved with paper tubes and 1/16 posts. The fuselage diagonal trusses are loaded in tension when the motor torque tends to twist the fuselage, hence their small cross section. I chose to have the required box section lying flatwise, rather than upright so as to get as much lift from the fuselage as possible. The best rigging I have found is with 2 degrees positive incidence at the wing and 0 degrees at the stabilizer. Both the wing and stabilizer are washed in about 2 degrees on the left panels. The propeller thrust line is parallel horizontally with about 1 degree left thrust. The model flies best with a 26 " loop x.098 TAN rubber (8/93) under a Cat IV ceiling and with a 22" loop x.092 under Cat III. During its record (pending) flight on July 3, 1995 (15:17), it bounced off the catwalk (177 ft.) three times and still landed virtually dead stick. This indicates that a longer flight may be possible using a longer loop of rubber in order to:
1) provide more energy and more turns and
2) increase the gross weight to avoid ceiling contact.
Careful construction to maintain true alignment and avoidance of warps will result in a model which will fly "right off the drawing board."

1/4 Motor Balancer

By John Linderman **(see plan)**
August, 1995

Add clay to balance beam so it stays level. It will have be be adjusted depending on humidity.
Make up wire spacers to 3/4 of distance of distance between prop shaft hood and rear hook. Use .020 to .025 wire for EZB. Use .035 for Limited Penny Plane. Put 1/4 " motor on long end of balance beam. Put spacer on other end, and add clay or copper wire until it balances. Use "o" rings on both ends of motor, with larger "o" ring on knot end. It helps prevent rubber climbing. The wire stop on balancer restricts balance beam from dipping too far when the motor is blaced on beam. If using a longer motor (1/4), you may have to place balancer on the edge of work bench to clear motor.
When changing motor size or length. merely add or take away clay until it balances. We're talking about spacer clay here. Clay should be centered on space.

EZB - AKRON LIGHT
By Larry Coslick

The Akron Light series had dramatically changed my thinking on building EZB's. Last year, I was convinced that a long motor stick and tail boom was the way to go. With better wood selection and improved building techniques, I have been able to build a very light model and still use an 8.4 to 8.75 inch motor stick. The lighter model flies slower, does not climb as high and gets as good or better times than my heavier model.

motor stick

Motor stick wood is selected from sheets of 3/32 balsa and 12 are cut at a time. After they are shaped and weighed, each is tested for stiffness using a spring loaded deflection gauge. M/S weights to shoot for are, .17 gram for a 8.4" stick and .2 gram for a 8.75" stick. The wire thrust bearing is made from .009 wire and the rear hook from .007 wire. The rear hook must be formed as shown on the plan, otherwise it will straighten out.

boom

It has to be stiff, but light. The best source for good boom stock is Indoor Model Supply. I order 10 sheets of 12" tapered stock at a time and cut several booms from each sheet. They are double tapered and no sanding is required.

prop

My new props weigh in at .1 to .11 gram. The spar is also cut from IMS tapered stock and double tapered. Each blade is 4.9 square inches and cut from .006 C grain balsa. Sheet weight must be around .13 grams to make a prop this light. Prop wood is cut on a bias and overlapped .030", then glued with duco. Attach the blades to the spar with thinned carpenters glue.

set up

The wing is adjusted with 1/16 wash in on the outboard wing panel by bending the rear wing post. This will automatically wash out the inboard panel. The wing is set with 1 to 1.5 degrees of negative incidence. Decalage is obtained when the model is launched and the tail boom goes positive. The stab should have no warps. The thrust bearing is set with 2 degrees left and 1 degree down.

testing

Our best flying site is a 27 foot gym and it's ideal for 1/4 motor testing. 1/4 motor testing is the perfect way to fully test your model. The Akron Light will handle a launch torque of .12 inch ounces and 1/4 motor flights of 7 minutes is not uncommon.

OPEN PENNYPLANE
By Dan O'Grady (see plan)

The design is Gord Wisniewski's. (Winning Indoor Designs, p. 48). The changes I made were minor.

-wing tip corners were made as per the stab.

-The motor stick is slightly smaller because of the glass rod I used as a form.

-the props I used were a carry-over from a Dennis Jaecks Pennyplane previously built.

-I used a captive rear hook (a Roy Bourke innovation - SAM 86 Speaks, Apr '93) to prevent the motor from twisting itself off the rear hook when the rubber bunches.

I left the boom detachable until I put in a couple of trim flights to establish the turning circle, then cemented the boom in that position.

The model is very well behaved, and flys well right off the board - a tribute to an excellent design.

AMA National Contest
July 15-18, 1995

By Larry Coslick

The contest started on Saturday and everyone had plenty of time to get their models trimmed during the Kibbie Dome Annual contest. Abram Van Dover ran the contest and did a great job for the AMA. As in the Kibbie Dome Annual contest, we started at 8:00 am and the last flight was launched around 7:15 pm

Jim Clem had posted good flights with his Penny Plane at the Annual contest, but hung it up on the curtain during an official flight at the National contest. Time was running out, so he asked Bruce Kimball to balloon it down. While Bruce was attempting to free Jim's model, the balloon exploded, sending the model to the floor in pieces. Dick Hardcastle had a motor slip off the hook of his "number one" Penny Plane and it destroyed the motor stick. Dick used his back up model to win Penny Plane with a flight of 16:16. Gene Joshu, in his first year of flying Penny Plane, placed Second. Jake Palmer, a senior from Salem, Oregon, flew a beautifully built Penny Plane to a new senior record of 15:09. Wally Miller flew a new V stab A-ROG which flew a smooth pattern to within 15 feet of the ceiling to win the event with 18:30. Steve Brown, the current FID world champion, won both AMA Stick and FID. Check out Steve's flight in FID. A new Cat IV AMA record - 49:23.

The Kibbie Dome is a great place to fly and there is a very relaxed atmosphere. People take time to chat and exchange ideas. Plan on being there in 1996!

HIGH ROLLER STANDARD/
UNLIMITED CATAPULT GLIDER

By Mike Thompson (see plan)

Here are the plans for my Standard/Unlimited Catapult Glider as requested. There is not much to say about trim on this model. There are probably better ways to trim, described in the "Winning Indoor Designs Book". My glider is launched almost vertical and does 2 rolls to the left. Glide is to the left and is rather fast. The model must not stall (it usually doesn't) but roll out into the glide between and above the bottom of the girders at USIC. This model is "dialed" in for the USIC site and is not a good performer for anything lower and higher. It has ballast, but I think that the record flights (177 seconds, 2 flights) show the limit of this glider.

Best unofficial flights at USIC: 84.1 seconds. Best unofficial flight at Akron: 91.2 seconds. I think 85 seconds is possible at USIC and for Akron 110-120 seconds per flight, but not with this glider.

One note on catapult, any flutter or vibrating parts on launch hurt the airplanes performance. Flappers are okay for up to 90 ft. ceilings but a ridged airplane is the way to go for high ceilings. That's about it.

Kibbie Dome Annual Contest July 12-13, 1995

By Larry Coslick

I had originally planned to fly to Moscow, Idaho to attend the Kibbie Dome Annual, The International EZB, and the AMA National contests. Gene Joshu, from the St. Louis area was planning to drive, so I decided to join him on the long trip. Forty hours later, after driving 2100 miles, we arrived at the Kibbie Dome the day before the start of the Annual contest. Several of the contestants had arrived early and we were able to set up our tables, but had no time for test flying.

If you never have been to the Kibbie Dome, let me tell you a little about it. It has a 147-foot ceiling with acoustical tile plates suspended about 2 feet below the ceiling. There is very little vertical separation between the plates, but around three feet of horizontal separation. Each plate appears to be about 12 x 12 feet. There is a clear spot in the center of the ceiling, with no tile plates, which is about a 60-70 foot square. In the center of the opening, there is a speaker support that is pulled up against the ceiling. It's best to avoid the open area, because a bad bounce off the speaker support would send the model above the tile. Very few planes ever come out. There is a large area to the east and west of the center to get in good flights. There are also three curtains that are suspended from cables at the 135-foot level. A few models get hung up on the curtains, but these can be lowered, so that the models can be retrieved.

Andrew Tagliafico puts on a great contest and everyone enjoys the low key approach. At the Annual, you can fly any of the AMA events at any time during the two-day meet. FID and lighter models are flown in the center and West sections of the dome and heavier models in the East end of the building. The air was quite good and lots of contestants posted their best personal times. Jim Clem put up a great flight of 15:20 in Limited Penny Plane to ace out John Linderman's 15:05. Dick Hardcastle's "early 1980's " Penny Plane has probably won more First place awards than any other Penny Plane, and he did it again with a good flight of 16:28. We were privileged to have two old-timers, Earl Hoffman and Warren Williams with us. Earl did not mind being hoisted 20 feet up with a fork lift to retrieve his model from the lowered curtain.

July 14, 1995 International EZB Contest

By Larry Coslick

Bob Stalick was our contest director and it was obvious that he had done it many times before. The contest was flown in rounds of 1.5 hours each and the best two out of six flights won. Most of the fliers put up their flights at the start of the round and there was plenty of time to prepare for the next round. I built two new Akron Light EZB's and increased the motor stick length to 8.75 inches. The first two flights were flown with a flaring prop, but the model would not get above 110 feet. The model had flown 28:01 during the Annual contest on the same prop, but the best time I could get was 26:31 during the International contest. I switched over to a back up model using a new symmetrical prop and posted a time of 27:09 to win the contest with a combined time of 53:39. Larry Calliau was second with 52:55 and Mike Palrang, a newcomer, was third with 49:12. There were 18 contestants and 46 flights of more than 20 minutes. We are considering alternating the International contest between Johnson City and the Kibbie Dome in the future.

1995 AMA National Contest Results

MANHATTAN CABIN	Time			Place	
Larry Coslick	11:06			First	
ROG CABIN					
Bob Jamison	1:15			First	
FAC PEANUT SCALE					
Orville Olm	146 Pts			First	
Ken Johnson	125 Pts			Second	
Earl Hoffman	122 Pts			Third	
FAC RUBBER SCALE					
Guy Russo	126 Pts			First	
Orville Olm	122 Pts			Second	
Jim Woods	103			Third	
FAC NO CAL SCALE					
Orville Olm	514			First	
Bob Schaffer	390			Second	
Ed Lamb	381			Third	
INDOOR H L GLIDER					
John Alling	109.7			First	
Darryl Stevens	108.5			Second	
Bruce Kimball	105.7			Third	
UNLTD CATAPULT					
Herb Robbins	103.7				First
Bruce Kimball	100.1				Second
Charles Dorsett	98.0				Third

1995 AMA National Contest Results

FID	Time			Place	
Steve Brown	49:23	*		First	New Record
Darryl Stevens	36:57			Second	
Edmund Liem	35:21			Third	
INTERMED. STICK					
Larry Coslick	37:27			First	
Dick Hardcastle	31:17			Second	
Warren Williams	26:47			Third	
PENNYPLANE					
Dick Hardcastle	16:16			First	
Gene Joshu	15:34			Second	
Bruce Kimball	13:51			Third	
PENNYPLANE SR.					
Jake Palmer	15:09	*		First	New Record
PENNYPLANE JR.					
John Schaff	11:45			First	
Nick Leonard	9:47			Second	
BOSTONIAN					
Larry Coslick	639 Pts			First	
Charles Schaff	515 Pts			Second	
Earl Hoffman	403 Pts			Third	
ORNITHOPTER					
Larry Coslick	18:22			First	
Gene Joshu	12:22			Second	
Mike Palrang	12:07			Third	
STD CATAPULT					
Ed Liem	103.4				First
Charles Dorsett	102.1				Second
Mike Palrang	31.3				Third

1995 Kibbie Dome Annual Contest Results
July 12 & 13, 1995

MINI STICK					
Larry Calliau	11:44				First
Andrew Tagliafico	11:35				Second
Wally Miller	11:28				Third
CATAPULT GLIDER					
John Linderman	99.8				First
Ed Berray	75.0				Second
P-24					
John Linderman	7:25				First
Ed Berray	5:13				Second
Guy Russo	2:48				Third
AMA SCALE					
Dave Haught	1:07		1911	Cessna	First
Ken Johnson	:43				Second
Dave Haught	:33			JU 88	Third
A-ROG					
Larry Coslick	15:44				First
Wally Miller	14:55				Second
Warren Williams	14:12				Third

1995 Kibbie Dome Annual Contest Results
July 12 & 13, 1995

ORNITHOPTER	Time			Place	
Gene Joshu	12:02			First	
Mike Palrang	11:16			Second	
Warren Williams	10:54			Third	
PRO-20					
Andrew Tagliafico	25:52			First	
Earl Hoffman	23:18			Second	
Warren Williams	20:15			Third	
EZB					
Larry Coslick	28:01			First	
Larry Callaiu	25:47			Second	
Dick Hardcastle	24:06			Third	
PENNYPLANE					
Dick Hardcastle	16:28			First	
John Linderman	16:22			Second	
Jim Clem	16:15			Third	
LTD PENNYPLANE					
Jim Clem	15:20			First	
John Linderman	15:05			Second	
Bruce Kimball	14:19			Third	
NO CAL SCALE					
Orville Olm	4:46			First	
Michael Morrow	4:17			Second	
Ed Lamb	2:07			Third	

AKRON, OHIO SEPT. 1995

USA TEAM SELECTION FOR THE 1996 FID WORLD CHAMPIONSHIPS

CONTESTANT	ROUND 1	ROUND 2	ROUND 3	ROUND 4	ROUND 5	ROUND 6	ROUND 7	ROUND 8	ROUND 9
Rich Doig	00:40:11	00:45:09	00:47:52	00:46:08	00:50:41	00:44:19	00:39:24	00:47:42	00:50:41
Gary Underwood	-	00:25:54	-	00:32:48	00:48:52	00:49:51	-	-	00:42:31
Cezar Banks	00:45:41	00:16:20	00:10:18	00:47:12	00:44:54	00:49:47	-	-	00:45:03
Bob Randolph	-	00:42:37	00:41:12	00:40:50	-	00:40:29	00:21:45	00:45:42	00:49:31
Don Slusarczyk	00:42:31	00:44:39	00:45:30	00:14:02	00:48:10	00:44:07	00:16:49	00:37:38	00:43:05
Larry Loucka	-	00:31:56	00:41:45	-	00:42:29	00:44:16	-	-	00:46:14
Stan Chilton	-	00:34:43	00:44:27	00:43:15	-	00:40:38	00:24:50	00:45:27	00:44:55
Jim Richmond	ATT	00:18:45	00:35:11	00:40:21	00:45:26	00:42:36	00:01:27	00:42:28	00:40:46
Bill Hulbert	-	00:30:11	00:19:58	00:37:27	00:42:43	00:20:08	00:39:10	00:42:12	00:41:53
Jesse Shepherd	00:14:19	-	00:30:28	00:32:25	00:37:50	00:22:50	00:21:37	00:40:33	00:24:26
Larry Mzik	00:33:32	00:36:50	00:26:34	00:33:07	00:39:07	ATT	00:32:57	00:35:02	00:38:35
John Kagan	00:31:21	00:14:37	00:35:48	00:33:30	00:36:20	-	00:35:34	00:31:49	00:37:40
Jim Clem	-	-	00:30:35	00:16:31	-	00:32:32	00:34:41	00:06:10	00:39:27
Tom Vallee	00:30:52	00:35:58	00:32:04	00:20:03	-	-	00:24:59	00:36:40	00:36:52
Bob Gibbs	-	00:14:10	-	00:35:16	00:31:28	-	00:21:22	00:26:32	-
Rob Eberle	-	ATT	00:36:33	00:16:16	00:28:26	-	-	-	00:25:21
George Chabot	00:27:59	-	00:34:59	-	-	00:24:49	00:17:34	00:23:52	00:27:52

CONTESTANT	BEST FLIGHT	2ND FLIGHT	TOTAL (Best 2)	FINALS PLACE	FINALS POINTS	REGIONAL POINTS	TOTAL POINTS	TEAM PLACE
Rich Doig	00:50:41	00:50:41	01:41:22	1	1000.00	100.00	1100.00	1
Gary Underwood	00:49:51	00:48:52	01:38:43	2	973.86	100.00	1073.86	2
Cezar Banks	00:49:47	00:47:12	01:36:59	3	956.76	100.00	1056.76	3
Bob Randolph	00:49:31	00:45:42	01:35:13	4	939.33	97.82	1037.15	4
Don Slusarczyk	00:48:10	00:45:30	01:33:40	5	924.04	100.00	1024.04	5
Larry Loucka	00:46:14	00:44:16	01:30:30	6	892.80	100.00	992.80	6
Stan Chilton	00:45:27	00:44:55	01:30:22	7	891.48	100.00	991.48	7
Jim Richmond	00:45:26	00:42:36	01:28:02	8	868.46	97.85	966.32	8
Bill Hulbert	00:42:43	00:42:12	01:24:55	9	837.72	96.64	934.35	9
Jesse Shepherd	00:40:33	00:37:50	01:18:23	10	773.27	100.00	873.27	10
Larry Mzik	00:39:07	00:38:35	01:17:42	11	766.52	86.66	853.19	11
John Kagan	00:37:40	00:36:20	01:14:00	13	730.02	80.19	810.21	12
Jim Clem	00:39:27	00:34:41	01:14:08	12	731.34	76.39	807.73	13
Tom Vallee	00:36:52	00:36:40	01:13:32	14	725.42	76.08	801.50	14
Bob Gibbs	00:35:16	00:31:28	01:06:44	15	658.34	100.00	758.34	15
Rob Eberle	00:36:33	00:28:26	01:04:59	16	641.07	84.32	725.39	16
George Chabot	00:34:59	00:27:59	01:02:58	17	621.18	83.28	704.46	17

CHILTON'S CORNER
By Stan Chilton

PACKING IN THE TURNS

After you've built and tested your model the final moment of truth is when you wind the rubber motor before making your first official flights.

If you don't get maximum turns in the motor, the other flyer who does may very well beat you assuming everything else is equal, torque, proper rubber size, rubber lube, etc.

In the last several years I have read about crystallization of the rubber motors, maybe caused by excessive stretching (or winding.) However, I have not been convinced enough to change my style of winding, because the bottom line is simply to get as many turns in the rubber motor as it will possibly take.

I have experimented with numerous types of lubricant to facilitate not only getting the winds in but unwinding these same turns with the most efficiency.

And I do know something is happening to Tan II more so than other batches of rubber and it very well may be crystallization, as it may break while winding, or on the model 35 minutes later.

But don't lose sight of the goal, and that is to get the maximum turns consistently every flight. And every official flight is always wound to max turns regardless of how many are backed off to get the desired torque level.

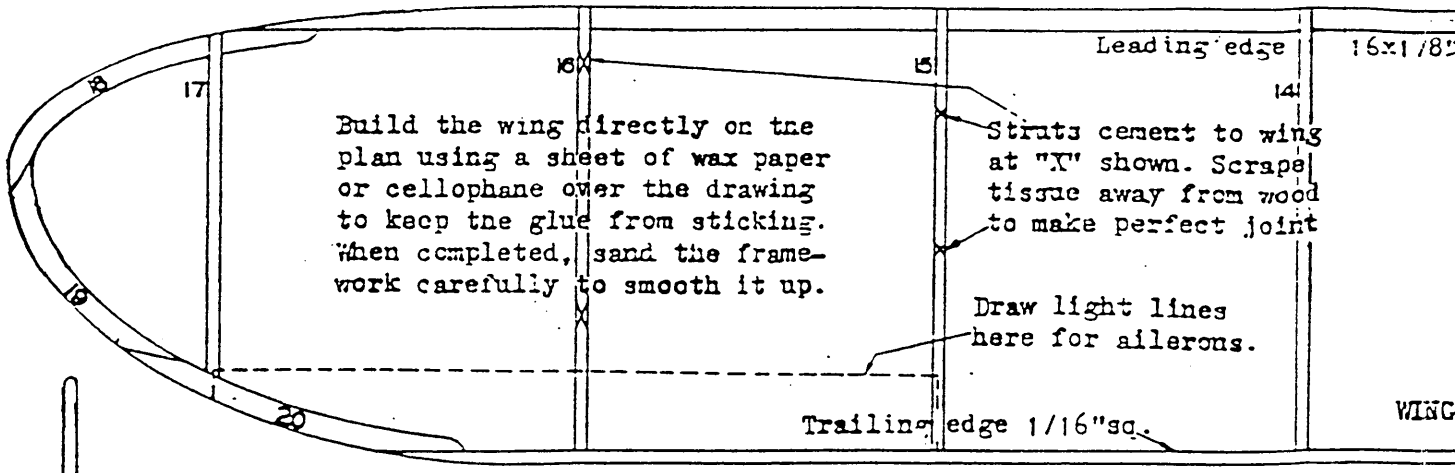
It seems that every indoor modeler has their own particular method of trying to get the maximum number of turns into any given rubber motor. And it also seems that whatever method one uses, it is seldom talked about.

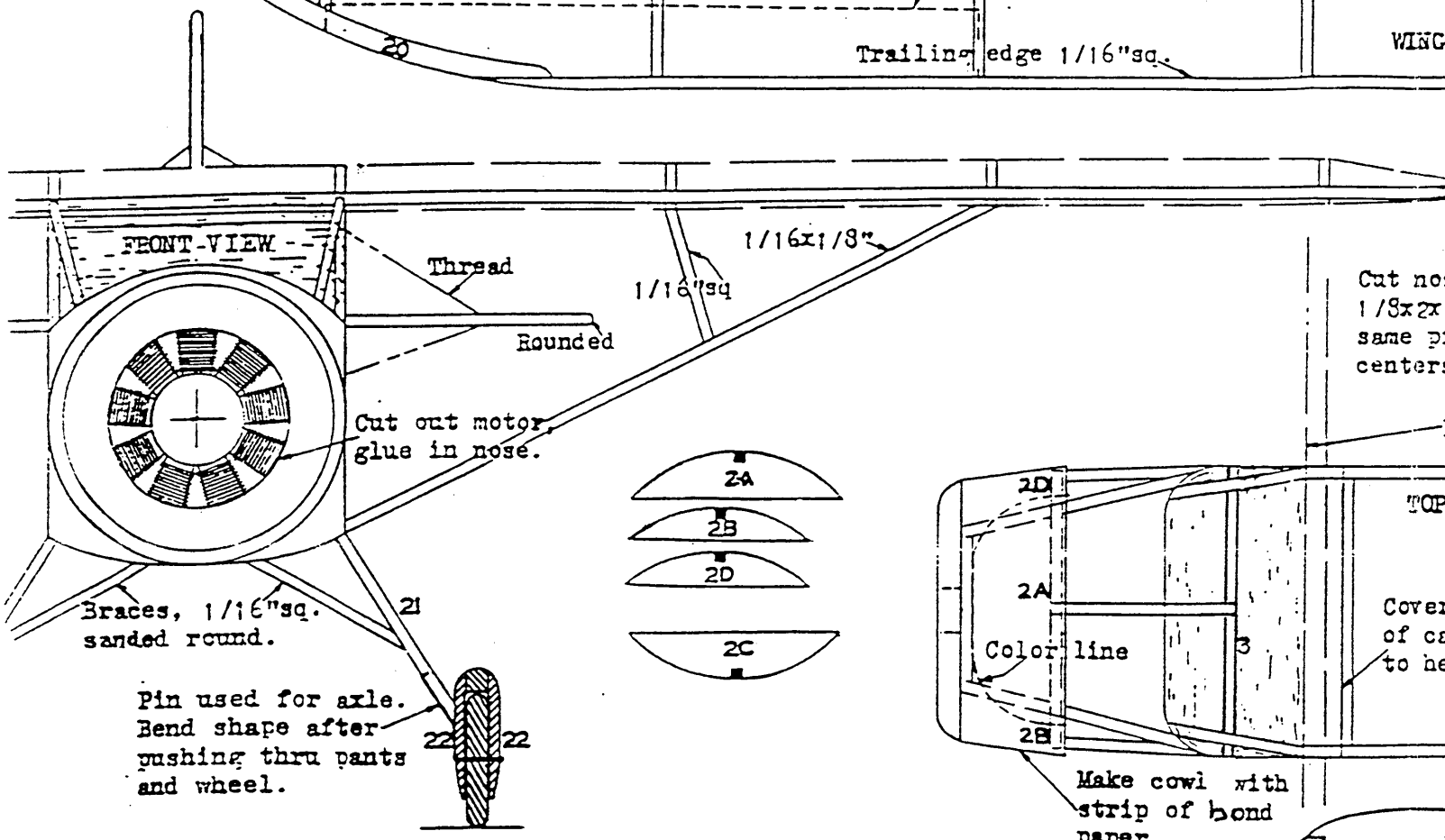
The situation is really very simple: If you can get 10% more turns into your motor you have a 10% advantage over your competitor.

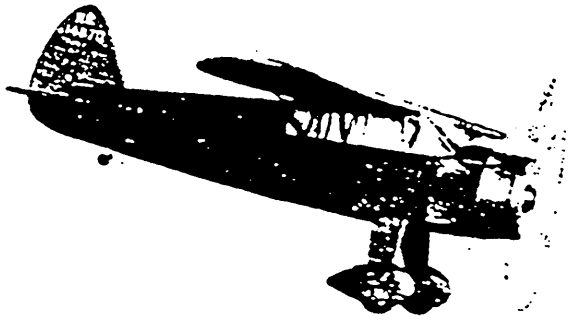
There are many different ways to wind up a rubber motor. I will tell you how I do it although it may be technically flawed. For instance Jim Clem doesn't stretch out the motor as far as I do. He feels that max stretching causes a crystallization of the atomic links of the rubber. Yet I've seen him crank in over 5000 turns on a Federation ROG!

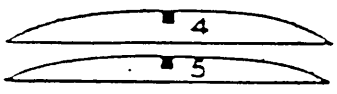
Following is how I wind a motor that I want to put in absolute maximum turns, under these assumptions: 1) The motor has previously been fairly well broken in or stretched to 90% length for 5 minutes and 2) the motor has been lubed with a proven rubber lubricant, preferably with silicon in it. 3) Calculate from a winds chart how many turns this particular motor should take. (For our illustration here we will assume 2000 turns max.) 4) It is helpful to install a brake on your winder so you can hold the winder in your one hand without the danger of free wheeling and losing turns, especially under higher turns and torque. 5) Create some sort of winder-torque meter set up where you can establish a model's hook to hook distance between the winder and the torque motor. The set up must allow the winder to be latched or held firmly at the hook to hook distance but at the same time be easily removable for winding and transfer to the model.

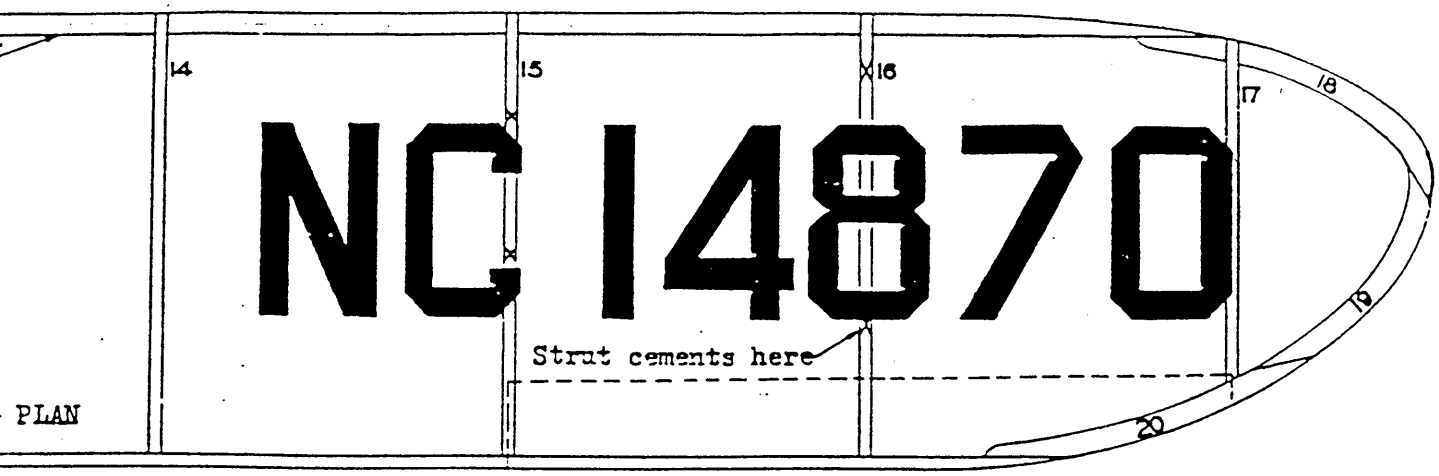
Now for the actual winding. Stretch the rubber loop as far as it can be stretched

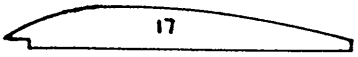

Leading edge
16x1/8
16
15
14
17
18
19
20
Build the wing directly on the plan using a sheet of wax paper or cellophane over the drawing to keep the glue from sticking. When completed, sand the framework carefully to smooth it up.
Struts cement to wing at "X" shown. Scrape tissue away from wood to make perfect joint
Draw light lines here for ailerons.
Trailing edge 1/16"sq.
WING


FRONT-VIEW
Thread
1/16"sq
1/16x1/8"
Rounded
Cut out motor, glue in nose.
Braces, 1/16"sq. sanded round.
21
Pin used for axle. Bend shape after pushing thru pants and wheel.
22
22
2A
2B
2D
2C
2D
TOP
2A
Color line
3
2B
Make cowl with strip of bond paper.
Color line
2A
3
Washers
2B
SIDE VIEW
Propeller
Bend hook like this and glue into propeller.
Nose bearing
2C
4
Rounded edges
21




4
5





numbers also on the bottom of the left wing, in order given.

Color scheme. Cover the model with blue and red tissue, red above the color line shown, blue below. Cover all wood parts with tissue.

se block from
3½". Use this
iece for pants
s also.

Position of wing.

VIEW

top
bin
re.

Cross braces

Color line

1/16"sq.

Position of rear rubber pin.

Draw light lines for elevators.

1/16"sq.

Rounded

NC 14870

NC 14870

Cut out these numbers and glue to tail.

Dash. Glue to #3

4,15,16

Color line

1/16"sq.

For cabin see notes.

Door outline

Heavy outline

Crossbraces go at "x".

Rear rubber pin here.

Thread brace

1/16"sq.

5

HOWARD DGA - 8

EXACT SCALE FLYING MODEL

just short of breaking it. For Tan II this stretched length is close to 10 times the original motor length. Of course the anchored end of the motor is hooked to the torque meter. Do this by holding the winder with motor hooked to it in your right hand and feeling the rubber tension with your left hand.

Now start winding slowly. At about 40 turns (the 2nd winder turn) start coming in as you continue to wind. Keep the rubber slack enough that it doesn't tighten up and break. Put in 500 turns and stop.

A. With your right hand holding the winder again and left hand feeling the rubber, back out (stretch) the motor and again to the max, just short of breaking.

B. Then start winding slowly and coming in at the same time. Put in 300 more turns. Start watching the torque closely now and come in just enough while winding to keep the torque from increasing.

Repeat paragraph A and once again put in 300 turns in the manner described in paragraph B.

At this point while alternating winding, relaxing and stretching drop the turns put in in each cycle to 100.

As you approach 1800 to 1900 turns you will notice the torque increasing in spite of coming in. The torque will increase dramatically as you stretch the motor back out as far as it will go.

The last 100 turns may be put on in 2 cycles of 50. If the motor now appears to be able to take more turns than your chart shows to be the estimated max turns put additional turns on as you think you can get away with, but never more than 100 at a time.

When you feel absolute max turns has been reached your rubber motor length should be at the model hook to hook distance. The motor tension at this point should be fairly tight at the hook to hook distance.

Back off the required turns to your desired torque immediately upon reaching max winds.

The winder may now be placed in its stand, or jig with its unwind brake on and the wound motor in place between the winder and torque meter ready for transference to the model.

As you are winding you will occasionally notice two things: 1) Knots grapevining out perpendicular to the motor, (Dick Hardcastle calls it "zinging out the side") and 2) Locations along the motor where there will be knots on knots where a heretofore even row of knots bunches up in clumps.

Both of those situations occur mostly when you are coming in while winding or nearing max turns.

Here again hold the winder in your right hand and knead, separate & massage the rubber motor knots with your left hand so you end up with as evenly wound motor possible. I feel that the rubber gets overstressed and is more likely to break at the knot on knot areas.

Some motors of equal size, length and weight will grapevine and knot on knot

much easier than others. Discard these motors when making a serious flight. Causes for the unevenness may be a varying density of the rubber or a varying width or thickness of the strands.

When making an official flight, I always try to have at least 3 identical motors broken in and ready to wind. This allows you to continue to get a flight in in spite of a broken first motor.

My technique of winding is similar to that described by R.W. New in the 1989 Free Flight Forum of the Model Engineers Exhibition, London, England. He described his winding technique as the "relaxation method," but he does not stretch the rubber as much as I. He holds the stretch to not more than 5 to 6 times the motor length, similar to Jim Clem's winding. But he did not have Tan II rubber.

There are two more points to point out in order to get maximum turns.

The first point is to make sure your torque meter's shaft and indicator needle is free and does not bind or drag. I have ball bearings in my torque meter but they are not absolutely necessary.

Once I was breaking motors almost every wind up, sometimes not even close to max turns. I noticed my indicator needle was dragging on the plexiglass face and causing it to jerk erratically. When I freed up the torque meter, I stopped breaking motors.

The second point is 100% mental concentration. Before beginning to wind the motor be sure you have no questions lingering in your mind about your model's adjustments.

When commencing winding, the only thing in the world to think about is your winder, the rubber motor and the torque meter. Focus and concentrate on the winding of the rubber motor.

It requires extra concentration if you have a talkative timekeeper, especially one who likes to tell jokes to other spectators just a few feet from where you're trying to get max turns on a motor!

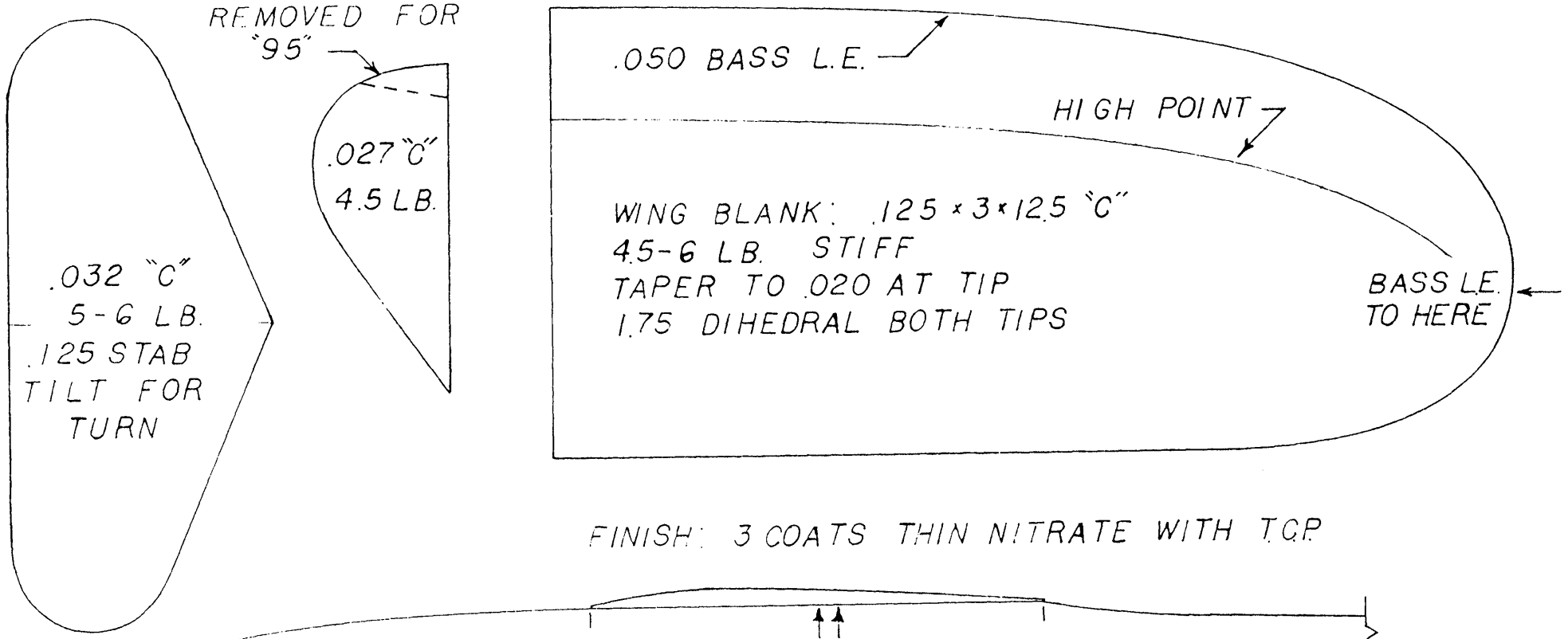
If someone walks up and asks me questions while I'm winding I invariably will quickly break the motor.

So to get max turns shut out every thought except that of winding the rubber. Do not hurry, the rubber motor isn't going anywhere. But it does take effort to coax maximum turns into the rubber motor, not physical effort, but total focusing of one's concentration toward getting the most turns in the motor.

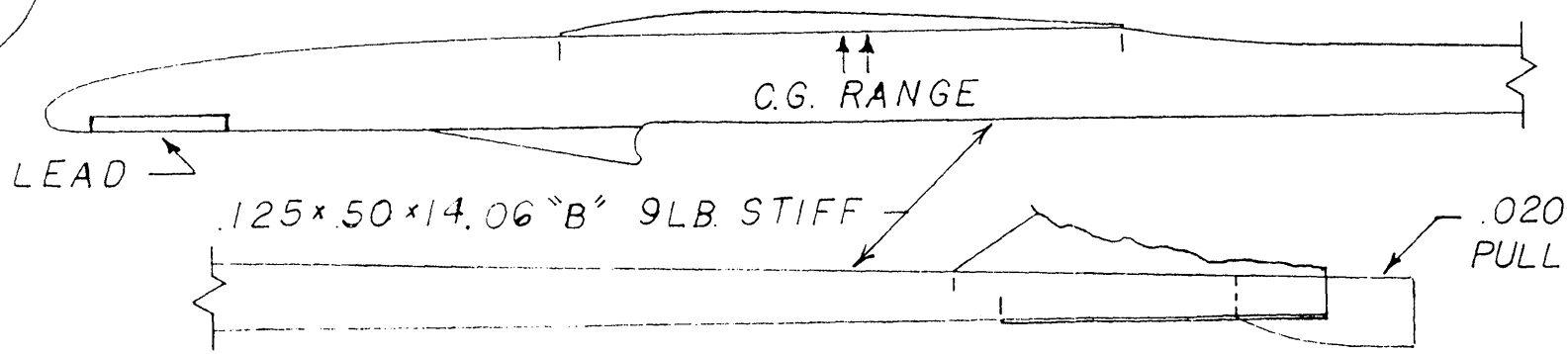
Always remember if you never break a motor going for maximum winds you are probably underwinding. (Or you have some super rubber, in which case call me collect.)

HIGH ROLLER "95"

CAT. IV AND USIC RECORD HOLDER



FINISH: 3 COATS THIN NITRATE WITH T.C.P.

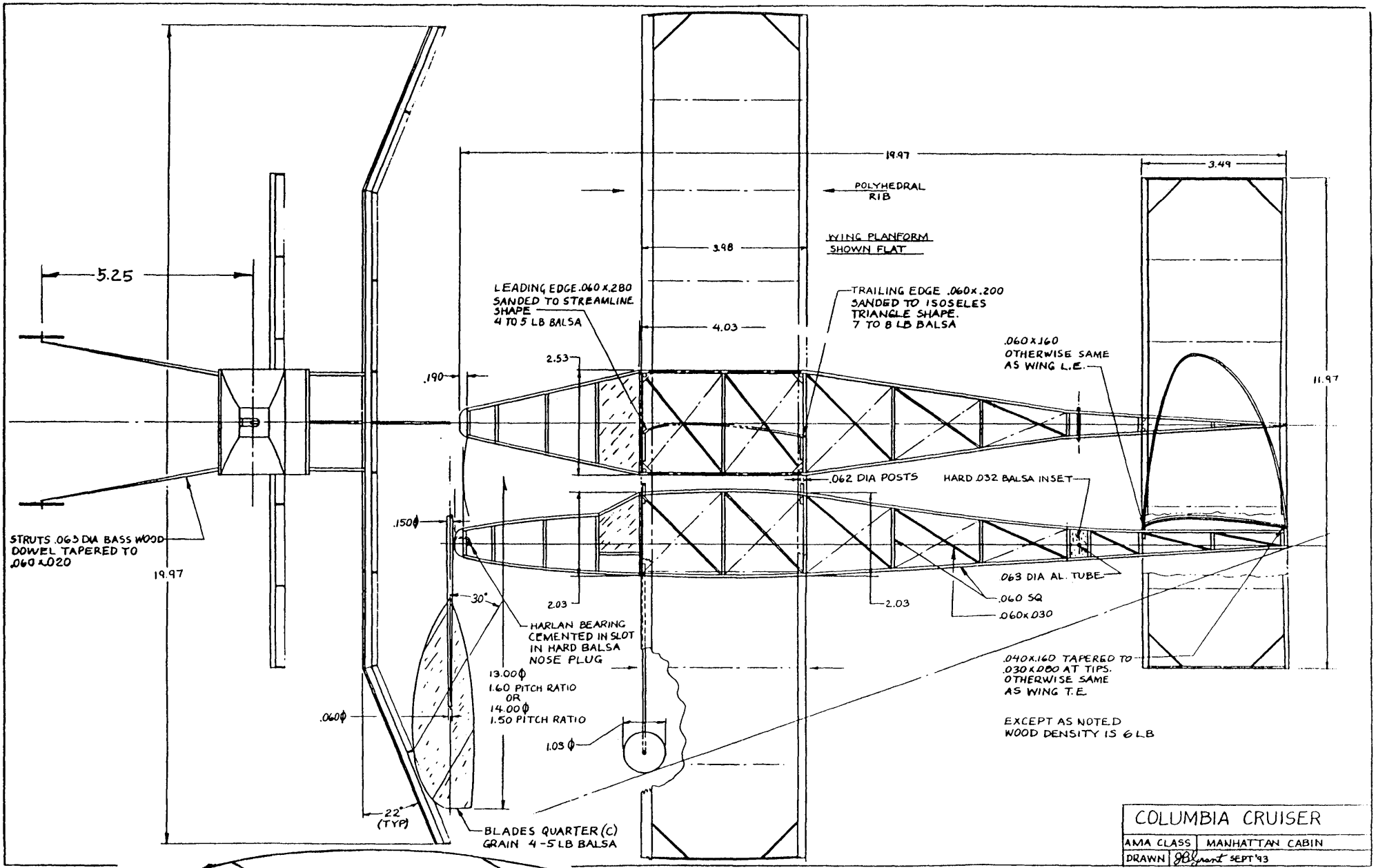


WEIGHT: 6.75 GRAMS
6.5 "

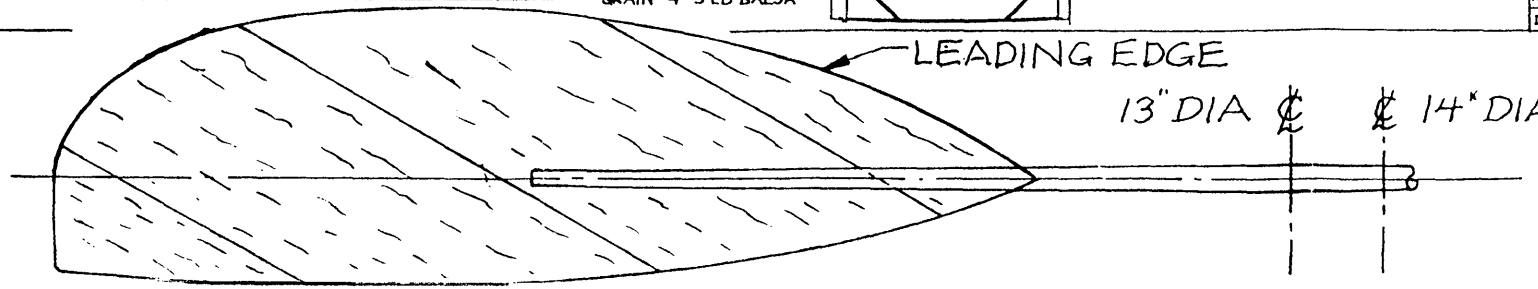
AKRON OHIO 177.4 SEC. 2 FLIGHT TOT.
U.S.I.C. TENN. 166.2 AND 165.2 " "

POWER: 2 LOOPS
.125 TAN II 8-93

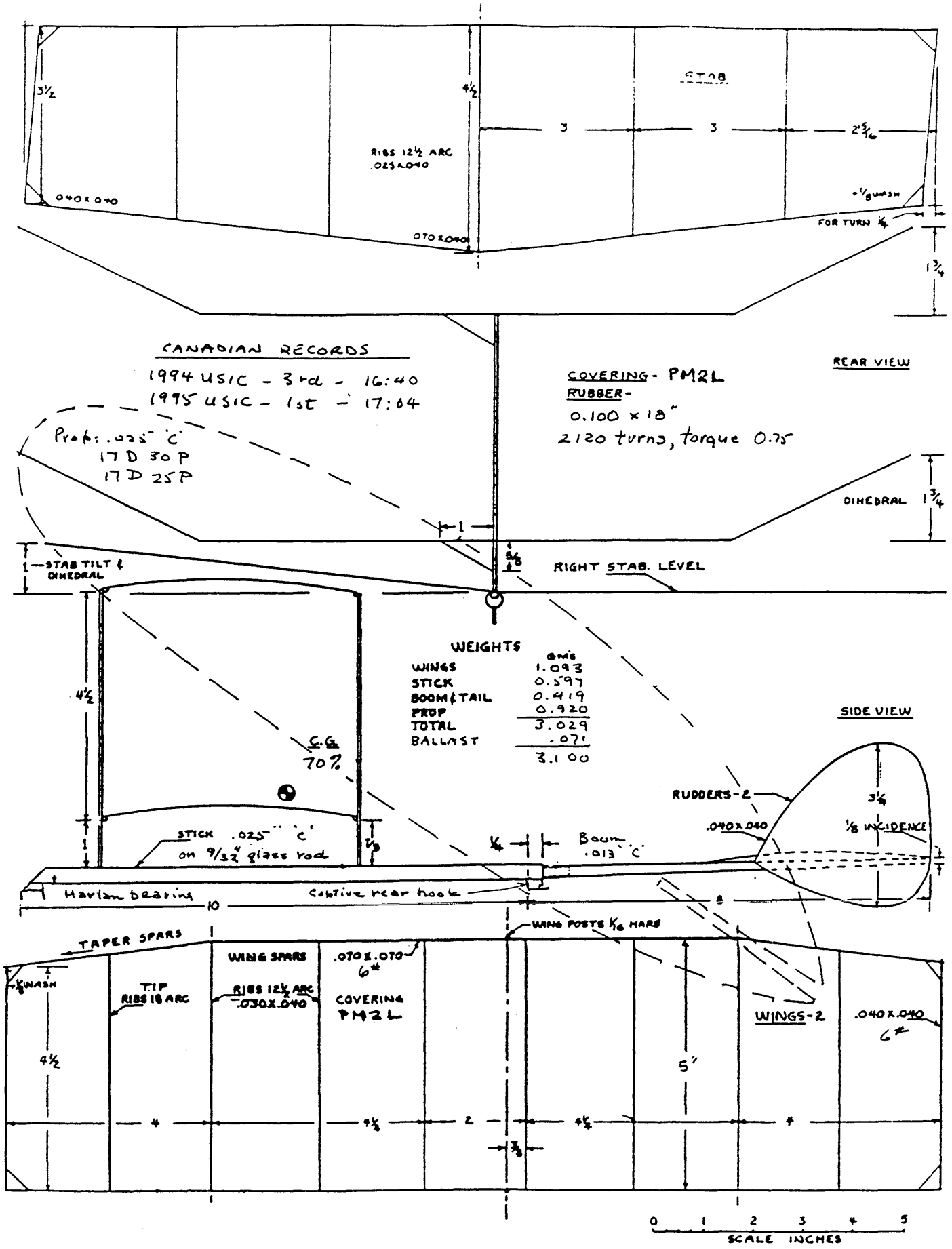
MOD. MARKOS DESIGN BY MIKE THOMPSON "1995"



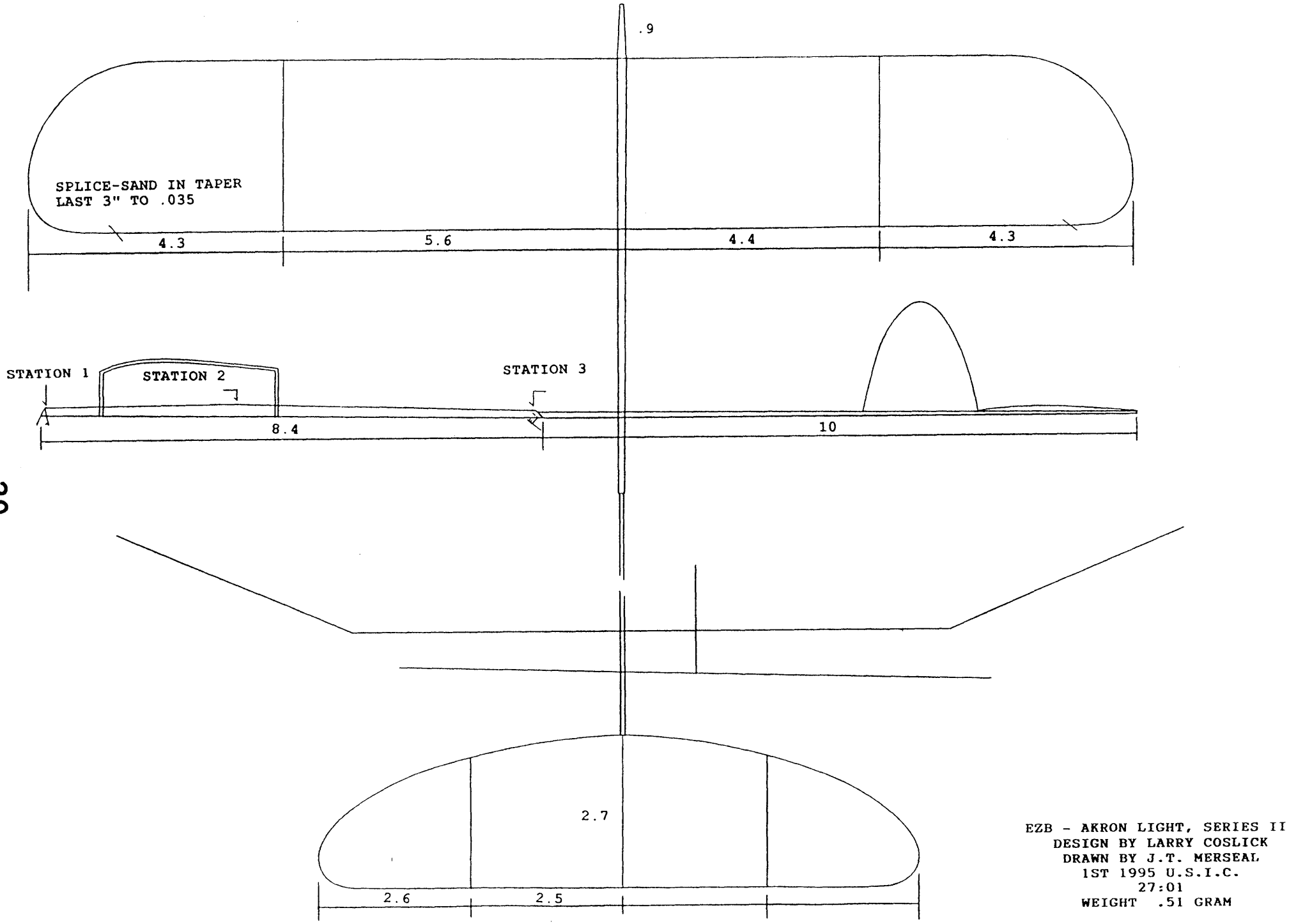
COLUMBIA CRUISER	
AMA CLASS	MANHATTAN CABIN
DRAWN	BGrant SEPT '93



FULL SIZE PROPELLER OUTLINE



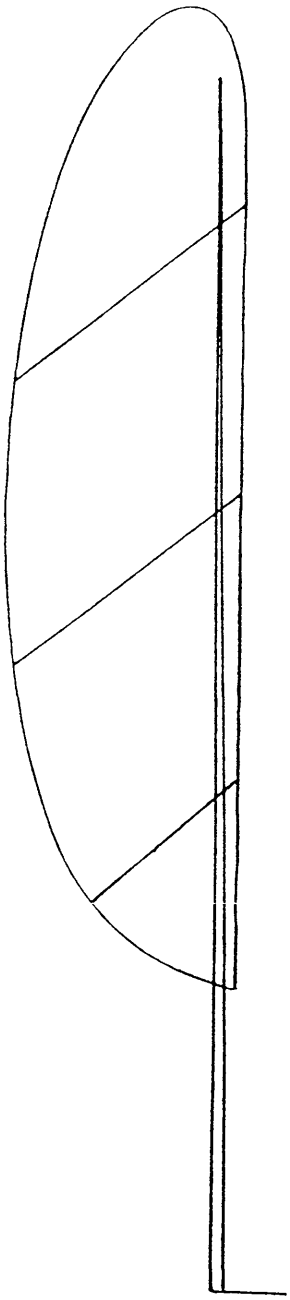
OPEN PENNYPLANE
BEST TIME: 17:04
1995 USIC
DAN O'GRADY

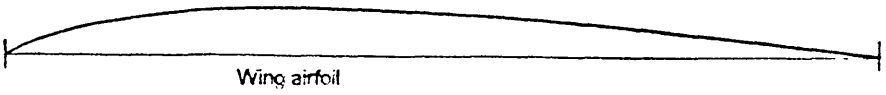


EZB - AKRON LIGHT, SERIES II
DESIGN BY LARRY COSLICK
DRAWN BY J.T. MERSEAL
1ST 1995 U.S.I.C.
27:01
WEIGHT .51 GRAM

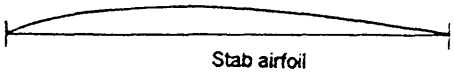
AKRON LIGHT

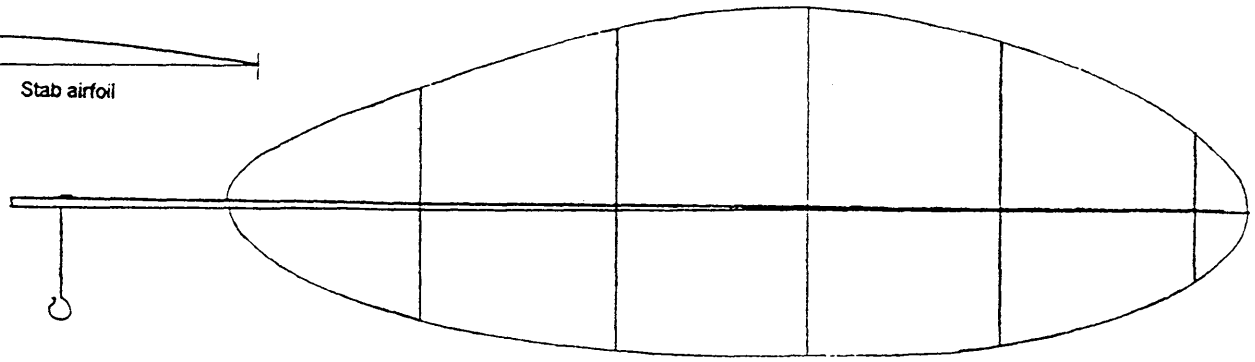
WING		
L/E CENTER SECTION	.063 X .028 NO TAPER	6.5 LB
T/E CENTER SECTION	.053 X .028 NO TAPER	5.5 LB
L/E TIP	.022 X .063 TO .035	4.0 LB
T/E SEE WING OUTLINE FOR TAPER		
WING RIBS (3)	.017 X .055	4.0 LB
WING DRY WEIGHT		90 - 95 MG
WING COVERED		140 MG
WING COMPLETE		155 MG
WING POSTS	.047 X .85	6 LB
STAB	.020 X .028	4.0 LB
STAB RIBS	.016 X .028	4.0 LB
STAB DRY		15 MG
STAB COVERED		33 MG
STAB TILT 1/4"		
FIN	.020 X .020	4.0 LB
FIN COVERED		5 MG
BOOM 10" FRONT	.093W X .060D	
REAR	.030W X .030D	30 MG
M/S 8.4"		4.22 LB
STATION 1	.150W X .100D	
STATION 2	.185W X .100D	
STATION 3	.120W X .100D	
CUT WEIGHT		160 MG
M/S COMPLET		177 MG
PROP SPARS - FROM IMS 12" TAPERED STOCK		
CENTER	.040W X .070D	
TIP	.020W X .020D	
WIRE PROP HOOK .009		
SPAR AND WIRE HOOK		30 MG
PROP BLADES .006		70 MG
PROP COMPLETE		110 MG
PROP	13.25" X 23P	
POWER 8/93 TAN II	.037" X 13"	



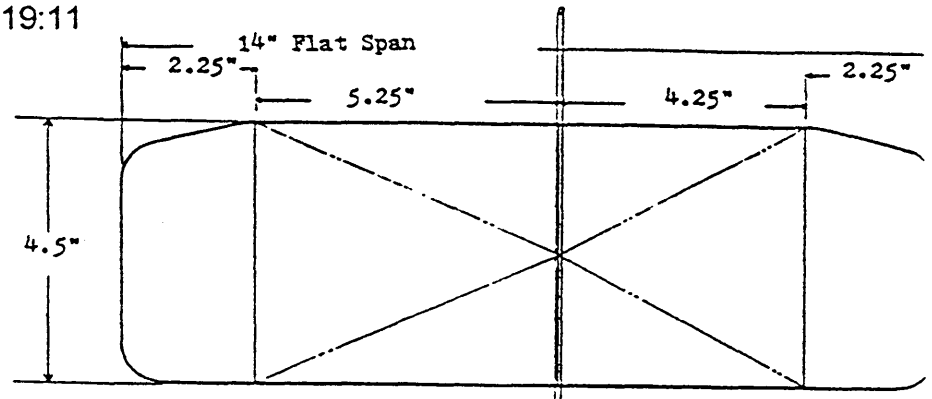


Prop 12.25" diameter
26.00" pitch



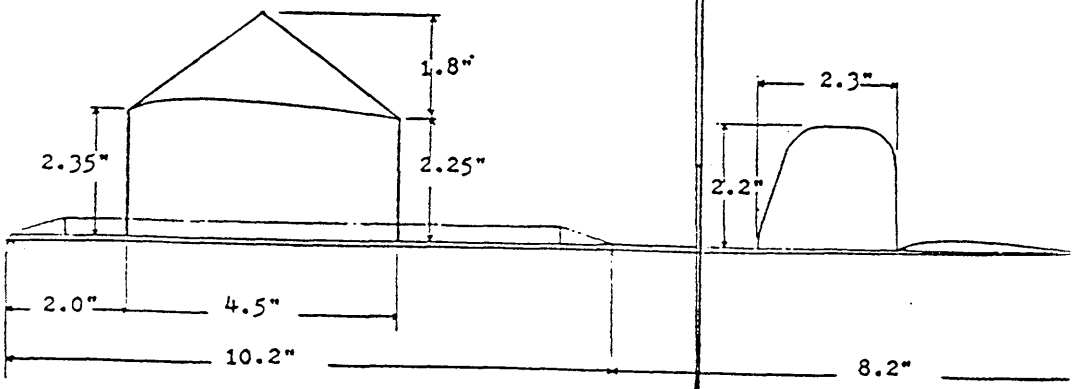


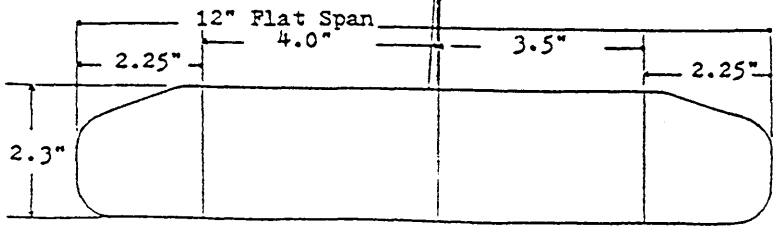
35 cm 1st Place 1995 U.S.I.C. 19:11
Motor .037 x 10.5" 1740 turns
Tom Sova (419-882-1273)
5325 Westcroft
Sylvania, Ohio 43560



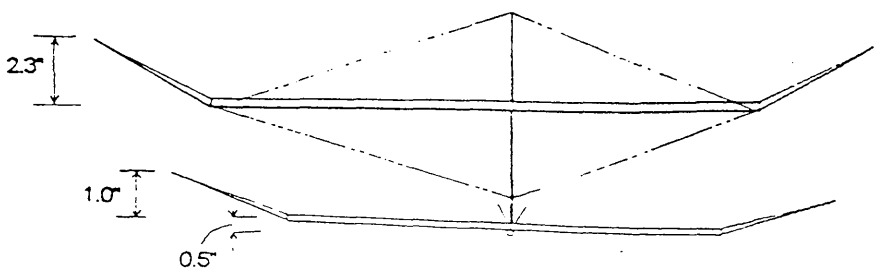
WEIGHTS

Wing	122mg
Stick	152mg
Stab/boom/fin	122mg
Prop	100mg
TOTAL	496mg

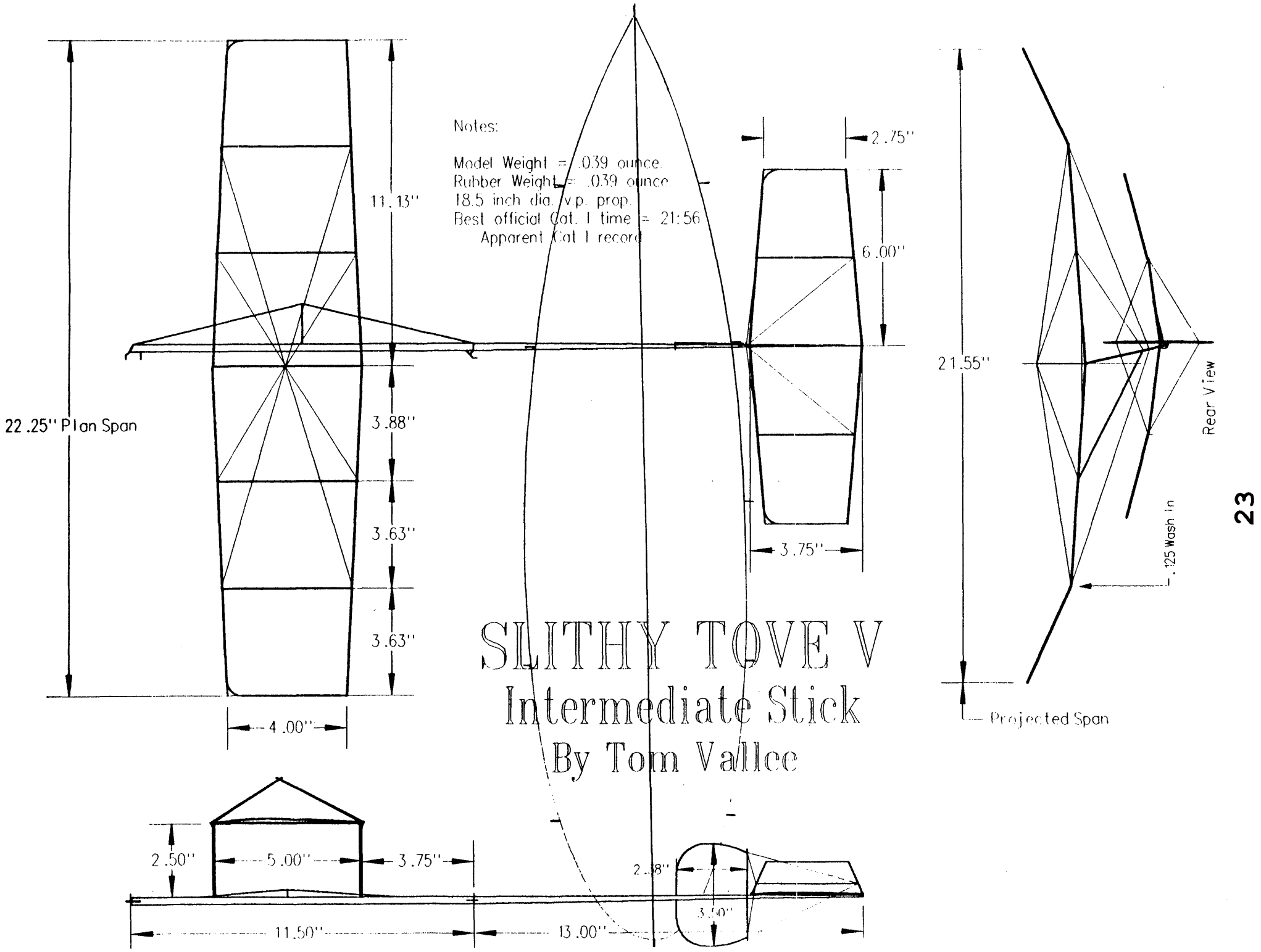




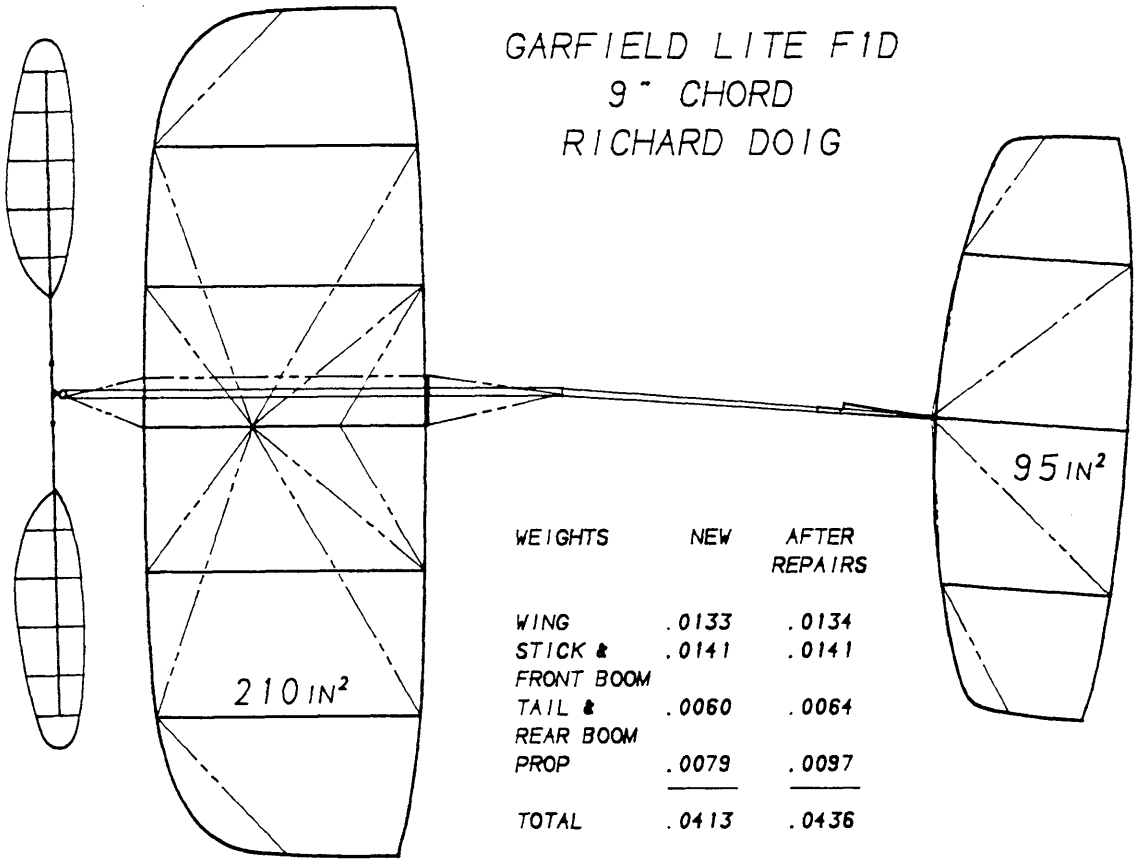
Wing	Center Spars	.040 x .028 5.5#
	Tips	.040 x .025 4.5#
	Ribs	.038 x .026 5.0#
Stab	Center Spars	.035 x .028 5.5#
	Tips	.035 x .025 4.5#
	Ribs	.035 x .026 5.0#
Rudder		.025 x .020 4.5#
Prop	Spar (round)	.065 ->.025 5.5#
	Outline	.025 x .020 4.5#
Motorstick		.014 4.5#
Boom		.010 4.5#
Wingposts/Cabane		5.6#



Rear View

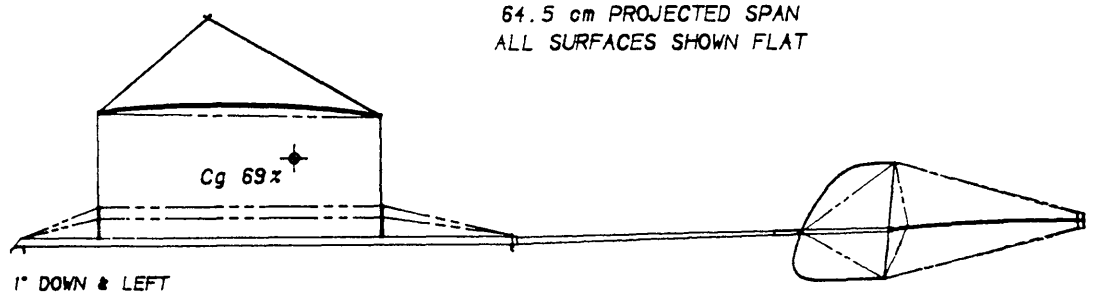

Notes:
Model Weight = .039 ounce
Rubber Weight = .039 ounce
18.5 inch dia. 7 v.p. prop.
Best official Cat. I time = 21:56
Apparent Cat I record
22.25" Plan Span
11.13"
3.88"
3.63"
3.63"
4.00"
2.75"
6.00"
3.75"
21.55"
Rear View
.125 Wash in
Projected Span
SLITHY TOVE V
Intermediate Stick
By Tom Vallee
2.50"
5.00"
3.75"
2.38"
3.50"
11.50"
13.00"

GARFIELD LITE F1D
9" CHORD
RICHARD DOIG



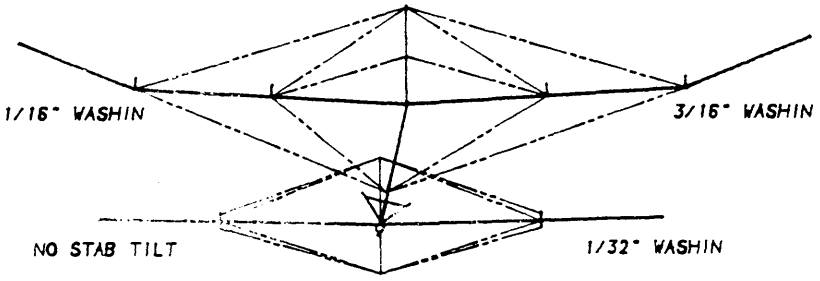
WEIGHTS	NEW	AFTER REPAIRS
WING	.0133	.0134
STICK & FRONT BOOM	.0141	.0141
TAIL & REAR BOOM	.0060	.0064
PROP	.0079	.0097
TOTAL	.0413	.0436

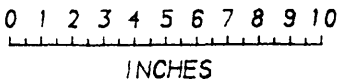
VARIABLE DIAMETER PROPELLER
21-15/16" DIA EXTENDED
18-5/16" DIAMETER RETRACTED
36" HELICAL INITIAL PITCH
64.5 cm PROJECTED SPAN
ALL SURFACES SHOWN FLAT

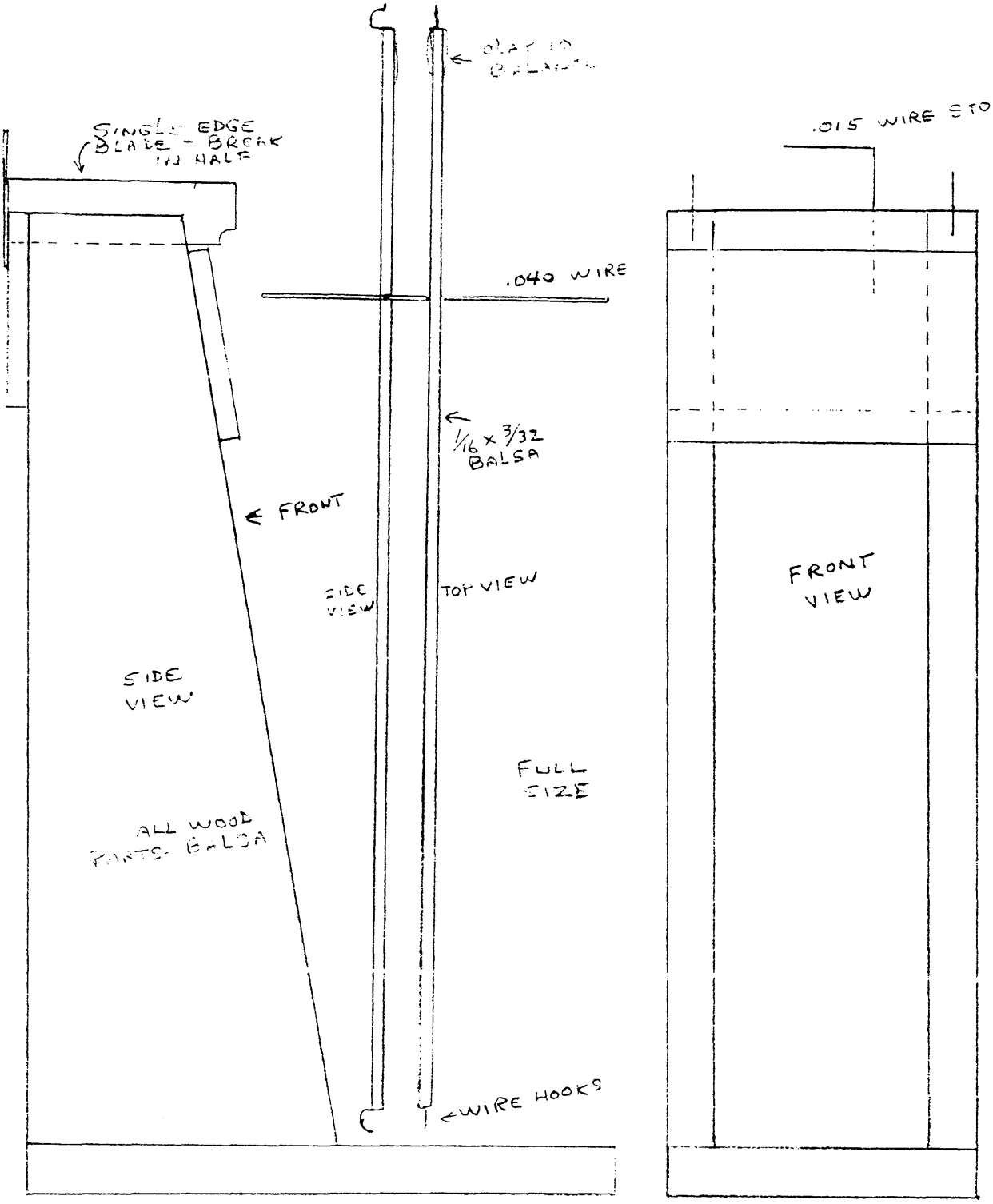


POWER - .068" x .042" FAI TAN-II
16-1/4" LOOP - .052 oz.
2600 TURNS MAX
BACKED OFF TO 2510 @ LAUNCH

1ST PLACE
1995 USA TEAM FINALS
50:41 + 50:41 = 101:22







1/4 MOTOR BALANCER

JOHN LENDERMAN
1994

1996 International Mini-Stick Postal Contest

The St. Louis Thermaleers invite all indoor flyers to take part in the 1996 International Mini-Stick Postal Contest to be held over the winter period. The rules for the contest will be as follows:

1. The contest is open to Indoor models that comply with the Living Room/Mini-Stick rules.

2. Contest flights are to be made between 1 Jan., 1996 and 31 Mar., 1996.

3. Any number of flights can be made at any number of sites.

4. All contest flights to be timed by someone other than the flyer.

5. All contest flights to be recorded on an official Results Form. (Included in this issue. Copies can be made.)

6. Best single flight time wins, after the flight time has been corrected for different ceiling heights. Ceiling height to be measured as per the FAI, but with a 5 metre diameter circle. The correction factor is 627 divided by (167 plus 46 times the square root of the ceiling height in feet). The time in seconds will be multiplied by this to give the corrected time.

7. Prizes will be awarded dependent on the number of contestants.

8. All Results Forms to be returned no later than 10 April, 1996 to the address below:

9. Entry is <u>free</u> to all contestants.

10. Results will be sent if a S.A.S.E. is included with the Results form.

Send your results to:

Larry Coslick
4202 Valley Crest Hills Drive
St. Louis, Missouri 63128

<u>MINI-STICK MODEL RULES</u>

Monoplane, max span	7.0 in.
Max Wing Chord	2.5 in.
Stick Length	5.0 in.
Max Model Length (less prop)	10.0 in.
Stab (Tail) Area	Max = 50% of Wing
Covering	Plastic/Paper. <u>NO</u> microfilm
Propeller	Wood Prop, 7" dia.max.
Minimum Weight	(0.43 gms)0.015 ounces

<u>Flying</u>

Steering	4 Ten Second Steers*
Attempt	15 Seconds or more*

*Special rules for very small rooms only! (Living Room flying.)

Indoor Postal Contest Results Form

Club Name_____

Date of Contest____/____/____ Site Name_____

Ceiling Height_____Feet

Contestant Name SMAE No. Age (if Jr.)	Address	Time in Seconds	Timer Initials	Leave Blank
		1.		
#		2.		
		3.		
		4.		
		5.		
		1.		
#		2.		
		3.		
		4.		
		5.		
		1.		
#		2.		
		3.		
		4.		
		5.		
		1.		
#		2.		
		3.		
		4.		
		5.		

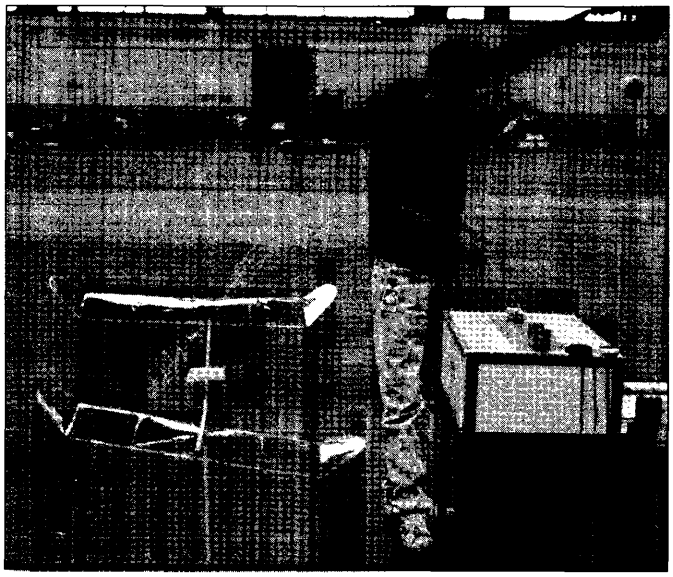
1995 Wally Miller International EZB Contest Results
Kibbie Dome, Moscow, Idaho July 14, 1995

Name	Best	2 Best		Total	Standing
L. Coslick	27:09	26:31		53:39	First Place
L. Calliau	26:38	26:17		52:55	Second Place
M. Pelrang	24:44	24:28		49:12	Third Place
E. Hoffman	24:58	22:49		48:47	Fourth Place
A. Tagliafico	23:55	23:00		46:55	Fifth Place
D. Hardcastle	23:38	22:50		46:28	Sixth Place
E. Liem	22:41	22:21		45:02	Seventh Place
J. Lenderman	22:00	21:58		43:58	Eighth Place
W. Miller	23:41	19:51		43:32	Ninth Place
E. Barray	21:15	20:59		42:14	Tenth Place Tie
L. Gitlow	21:22	20:52		42:14	Tenth Place Tie
B. Kimball	21:36	19:29		41:05	Twelfth Place
T. Taylor	20:41	19:56		40:37	Thirteenth Place
D. Stevens	20:43	18:54		39:37	Fourteenth Place
J. Clem	19:24	19:05		38:29	Fifthteenth Place
B. Martin	17:47	17:46		35:33	Sixteenth Place
B. Rovick	18:12	17:04		35:16	Seventeenth Place
B. Tenny	14:06	13:30		27:36	Eightheenth Place

Indoor News & Views

1995 F1D Team Selection Finals

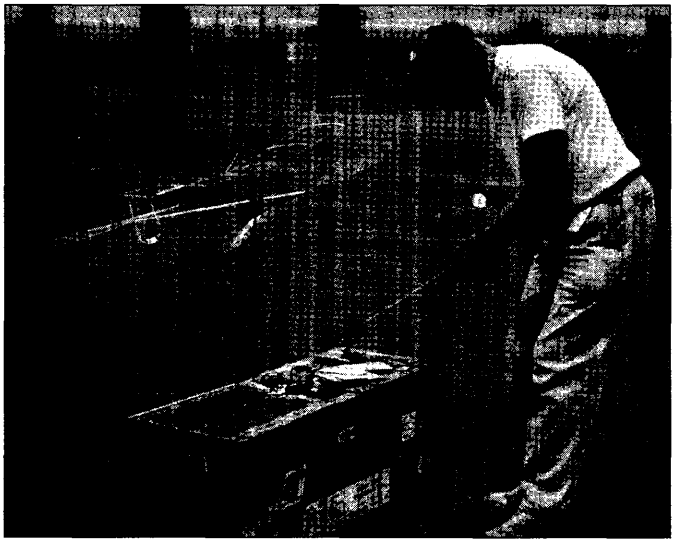
Jesse Shepherd made his first ever 40+ minute flight.



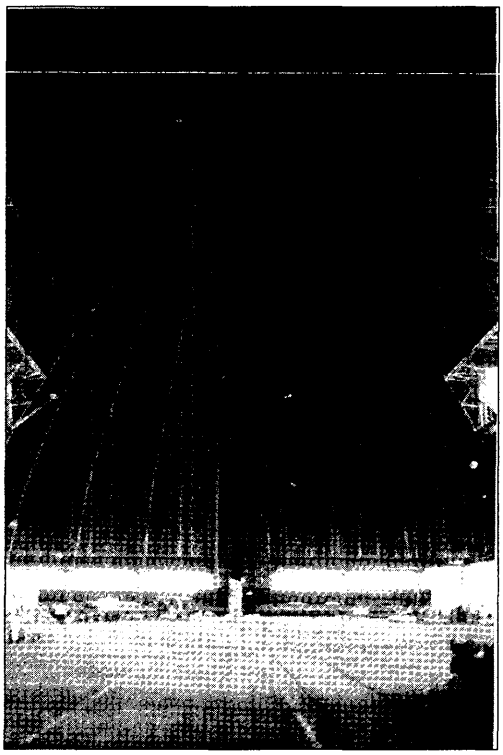
Seventeen year old Rob Eberle in his first F1D Finals. The model is an unbraced tandem similar to Bernard Hunt's design.

George Chabot had all kinds of problems with over-taught film warping his stabs, but he still had a great time.

Bill Hulbert made the arrangements to use this spectacular site for the Finals, and two other flying sessions earlier in the year. Our hats are off to his continued efforts.



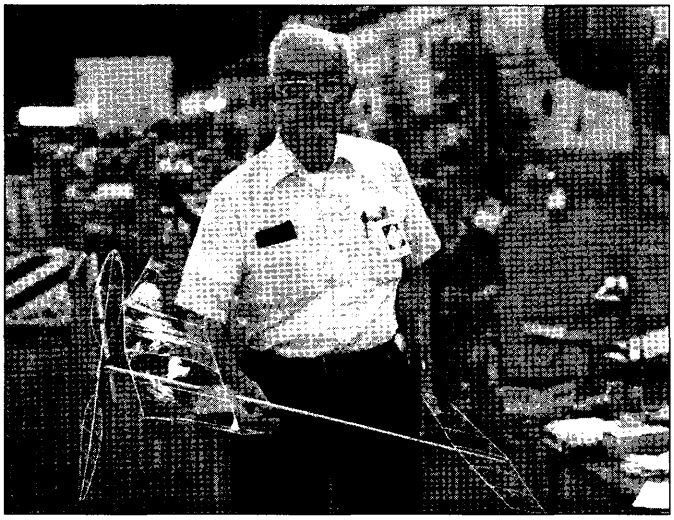
Cezar Banks made the team for the eighth straight time, barely missing 50 minutes with a high time of 49:47. Cezar used a 13 year old prop that has been re-covered numerous times.



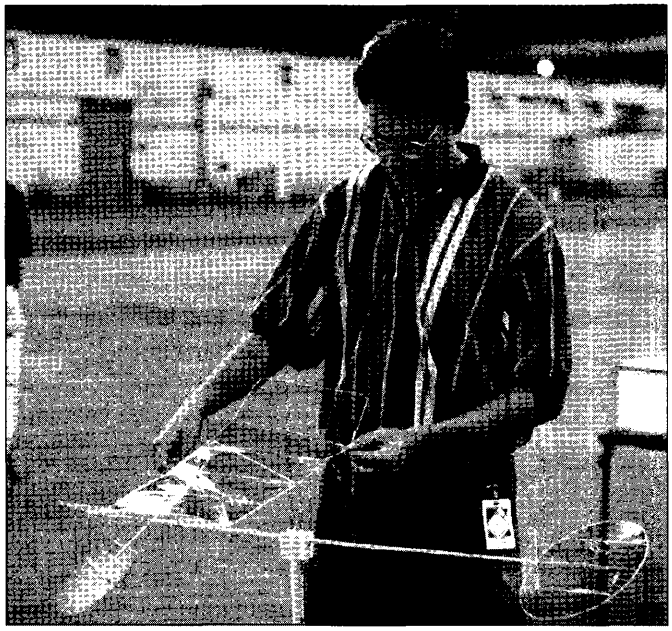
The immense Loral (formerly Goodyear) Airdock. The building is 326' wide at the floor, and 180' high to the beams. This photo was shot from only mid-way down the hanger.

Gary Underwood left everyone stunned as he rallied after a first day slump to post 48:52 and 49:51 in the 5th & 6th rounds, earning his first team spot in only his second Finals; barely missing 50 mins.

CD Dan Belieff managed to keep tempers under control and ran a very smooth contest.

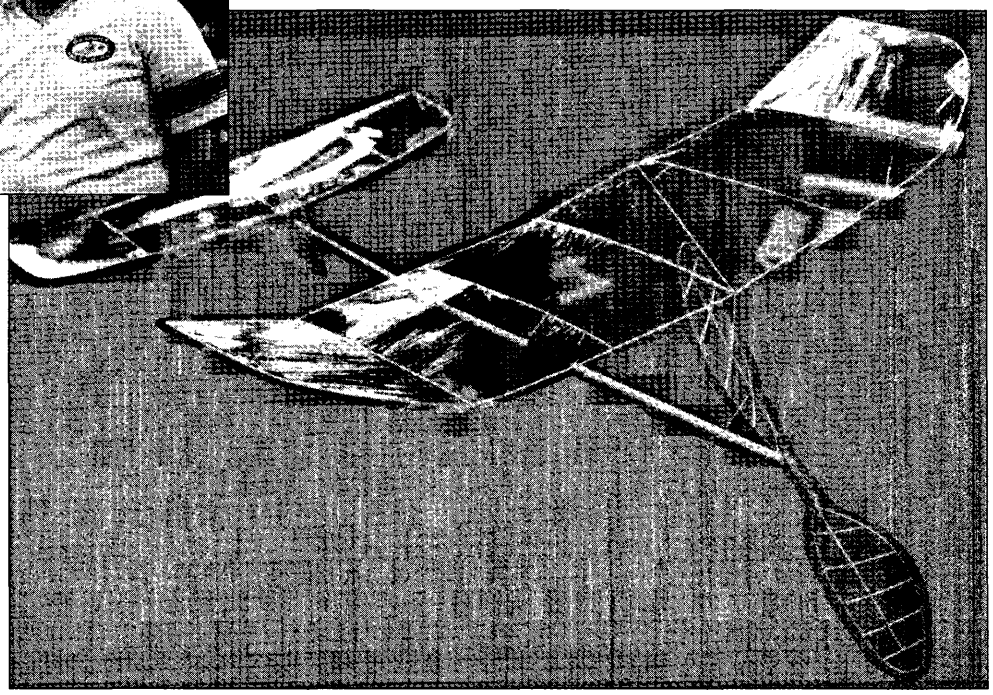


Bob Gibbs flew the same unbraced design as at the 1993 Finals, but was unable to get consistent performance in the turbulent air.



First time Finalist John Kagan unfolding a collapsed wing. John is part of a new group of young flyers who fly regularly at Lakehurst.

Above: Rich Doig beams after landing the first ever 50+ minute flight in competition. The variable diameter prop worked perfectly, and the model dead-sticked, winding the rubber up 20 turns in the opposite direction!



Right: Rich Doig's "Garfield Lite" F1D scored the first ever 50+ minute flights in competition with two identical flights of 50:41.

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and Views

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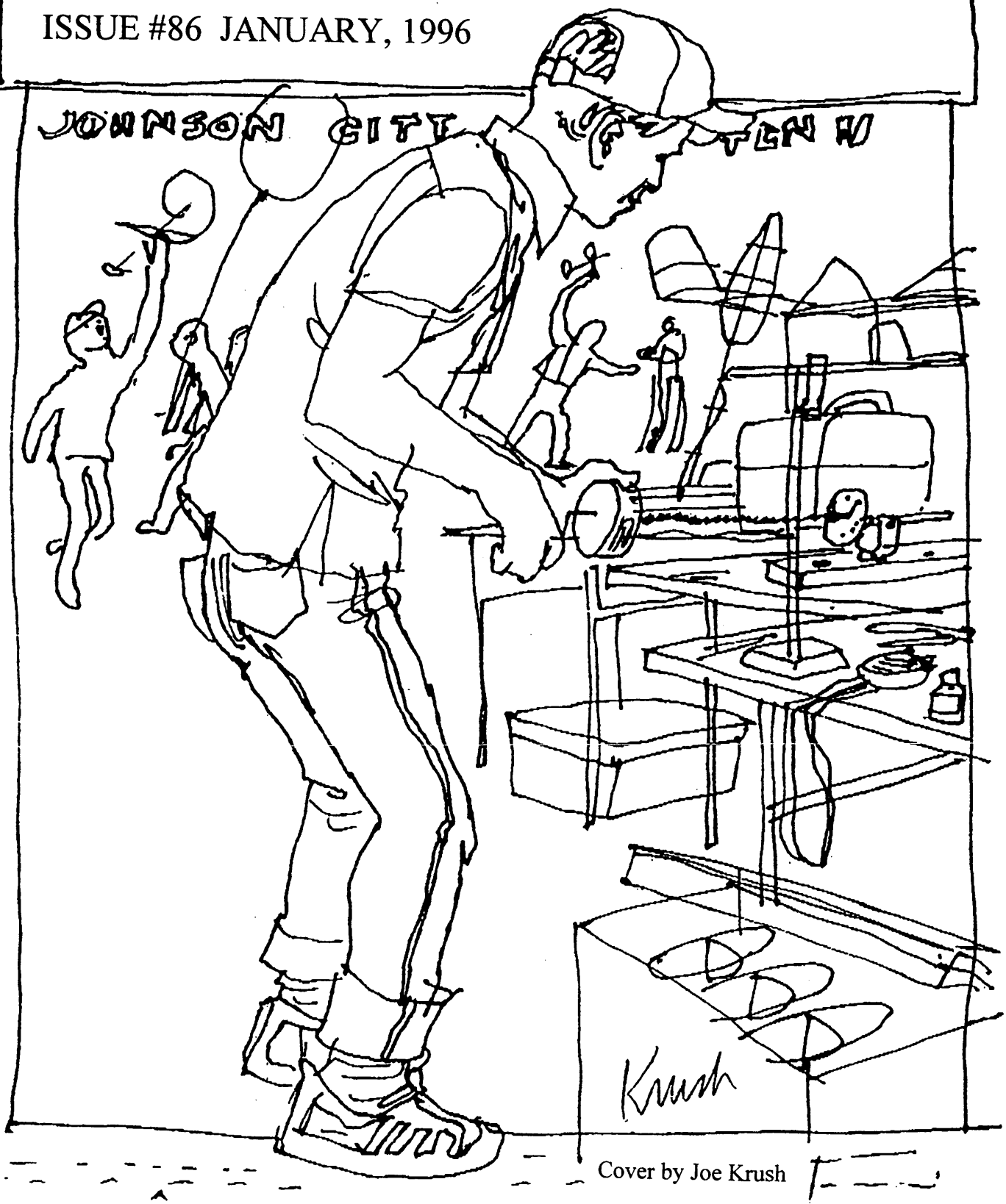
HAPPY NEW YEAR

ISSUE #86 JANUARY, 1996



Cover by Joe Krush

INDOOR NEWS AND VIEWS (INAV) IS PRODUCED IN ST LOUIS BY ROY WHITE,
LARRY COSLICK, MARY JANE REILLY HOWARD HENDERSON AND BILL MARTIN.

INAV DUES ARE:
U.S. $9.00/year
Canada $12.00/year
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H PIET H@AOL.COM

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CHILTON'S CORNER
By Stan Chilton

WING BRACING: If wing is braced on a jig requiring it to be lifted or removed after bracing, modify the jig so it is at least 3 inches longer than the wing, beyond each tip.

****

To then remove a braced wing, turn jig upside down, support both jig ends outside wing tips at least 24 inches above floor, and let wing drop out of jig, releasing any snagged bracing on jig as necessary.

This way bracing is never subjected to any force beyond that of the weight of the wing.

BRACE WIRE TENSION: Have you ever had wing spars buckle between bracing points due to high humidity at the flying site?

The problem can be corrected in most instances (when building the next wing or stab) by bracing with less tension on the bracing wires. How much less? Too much less tension and the wing gets floppy and weak in dry, hot conditions.

Two important points to remember in bracing are proper tension and even tension.

Check over the variety of pins you have on hand. In addition to the conventional straight pin, there are different sizes of "T" pins and smaller 1/2 in. long pins known as bankers pins. From this assortment prepare the pins with a hook on the sharp end and cut of file the pins so you end up with about 8 pins of each individual weight of .001, .002, .004, .005, .006, and .008 ounces.

I have been using .006 oz. weights for tension on FID wings, .004 oz. on smaller intermediate stick wings and .002 oz. on braced stabs.

If your braced parts are too floppy or loose, re-brace with slightly heavier weights. If the braced parts warp or bend inside the braced areas, go to a lighter brace weight.

Some modelers use up to 3 pins together for bracing tension weights, some use no weights, just 3/8" square folded masking tape at the wire ends. Different techniques will require different weights, and may vary if you brace differently.

I have heard of modelers standing at the top of a stairwell and bracing a jig-mounted FID wing in about 30 seconds with just one long piece of bracing wire with a tension weight at the bottom end. This method satisfies my two concerns of proper tension weight and even tension, but I've never tried it.

Some modelers have used a quarter taped to the brace wire for motor stick brace wire tension. An average quarter weighs 5.96 gm or .196 ounce.

For the strongest motor stick, it should be braced in a jig that bends its ends away from the rubber motor side about .015" on each end.

When a fully wound motor is hooked up, the stick will flex to perfectly straight, as we want it be.

MOTOR STICK BRACING: For bracing motor sticks, I use a large 1 1/2" long concrete piercing nail, weight about .125 ounce.

****

CARE OF YOUR RUBBER STRIPPER

Although a rubber stripper is built from aluminum, it is a dense block that easily may slide off your hand while stripping rubber and hit the floor, damaging its blades and other parts. To avoid this, there are several ways to hold it safe while using it.

One way is fixing it to the board, drilling and tapping two holes on the undersurface, so bolts can be mounted and then clamped to the working board. This way lets you use both hands for the job.

Another is drilling a hole across on one upper corner and inserting a piece of piano wire and a strap, like the ones used for cameras, and slipping it on your wrist. The length should be such that allows you enough freedom but does not let the stripper hit the surface of the board in case it slips off your grip. Or, instead of slipping the strap, run a cord that hangs from the ceiling and keeps the stripper at the desired height. If you want some flexibility, the cord may have a spring, strong enough to take the weight but that allows you some play. The strap is great for field work, so have it installed when you bring the stripper to contests and need to strip motors right away. (Bob Oppegard sells a stand w/holder and table clamp for $25)

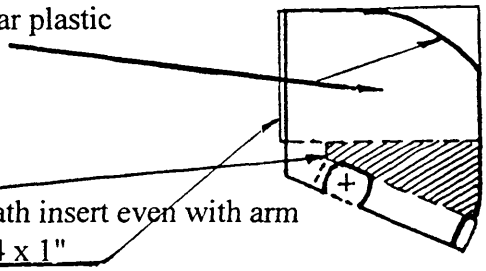
IMPROVING YOUR OPPEGARD RUBBER STRIPPER

1. Adjusting the pressure on the rubber and holding it in place with the arm can be made easier, modifying the holding screw as a wing nut using a paper clip. Just bend a paper clip with round nose pliers, to look like a wing nut, of a size of about 1/2 inch wide and 1/4 inch high. Remove the screw and cya the wing nut in place on the screw's groove, holding it vertically while it sets. If using thin cya, add baking powder to fill the gap.

2. Getting cleaner cuts, closer to square

(rectangular), can be achieved by making a holder using clear plastic, and attaching it to the holding arm. Cut the piece to shape and cya to the arm. Now add the insert underneath, even with the arm. Its purpose is to work as a guide to the slide. Cut the slide to size. Run the screw in place and install the assembly, with the slide. The slide will hold the rubber flat, reducing or eliminating the trapezoidal shape.

Rubber hold-down for Oppegard stripper
.020" clear plastic



Source - Unknown

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ROB EBERLE, A RISING STAR IN MODEL AVIATION

My name is Rob Eberle. I am 18 years of age as of December 4, 1995. If all goes well, I will compete along side the other three U.S. team members in Moscow, Idaho in September at the next FID world championship as the U.S.'s first ever Junior team member.

According to the rules, it is unclear whether or not I am too old to compete at the Junior level. I am presently waiting for a ruling from the FAI board on the age cut-off for Juniors at the next world champs.

I decided about three years ago that I would like to compete with FID's. I realized that the U.S. had no team members that were my age. Soon after I got my first FID to fly, I started to send out letters to different agencies regarding funding and establishing a Junior program. This began my quest to be the first Junior team member from the U.S.

I started with sturdy, conventional models and, as my times slowly increased, I decided to build lighter and more carefully. The headaches got larger, while my times stayed the same. Two summers ago, (after 18 airplanes that summer alone) my times finally rose into the low thirties. I had officially qualified for the team finals. After a winter of testing and changing my model design to the "California" style. I began last summer, confident that I would break 40 minutes. Well, after going through another 10 models, I found my quick fix for the finals - an unbraced tandem. This model design got me through the finals, kept me out of last place and raised my high time, with a fully polymicro covered version to 36 minutes, all in about a month.

Now, 3 years later, after tons of letters, hundreds of phone calls, many long hours, and about 30 models, I still await a final answer as to by being able to represent out country at the world champs. Thanks to unbelievable support and help from Gary Underwood and Rich Doig, the matter is out of our hands. We have done everything possible and now must sit back and wait.

I must say that if I do get the chance to represent our country, I will fly my hardest and put forth a valiant effort. If I do not, I appreciate everyone's help and efforts and hope that I have paved the for the next Junior FID flyer.

Source: New York Indoor Times (Edited)

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TRUE TANDEM F1D by Bernard Hunt

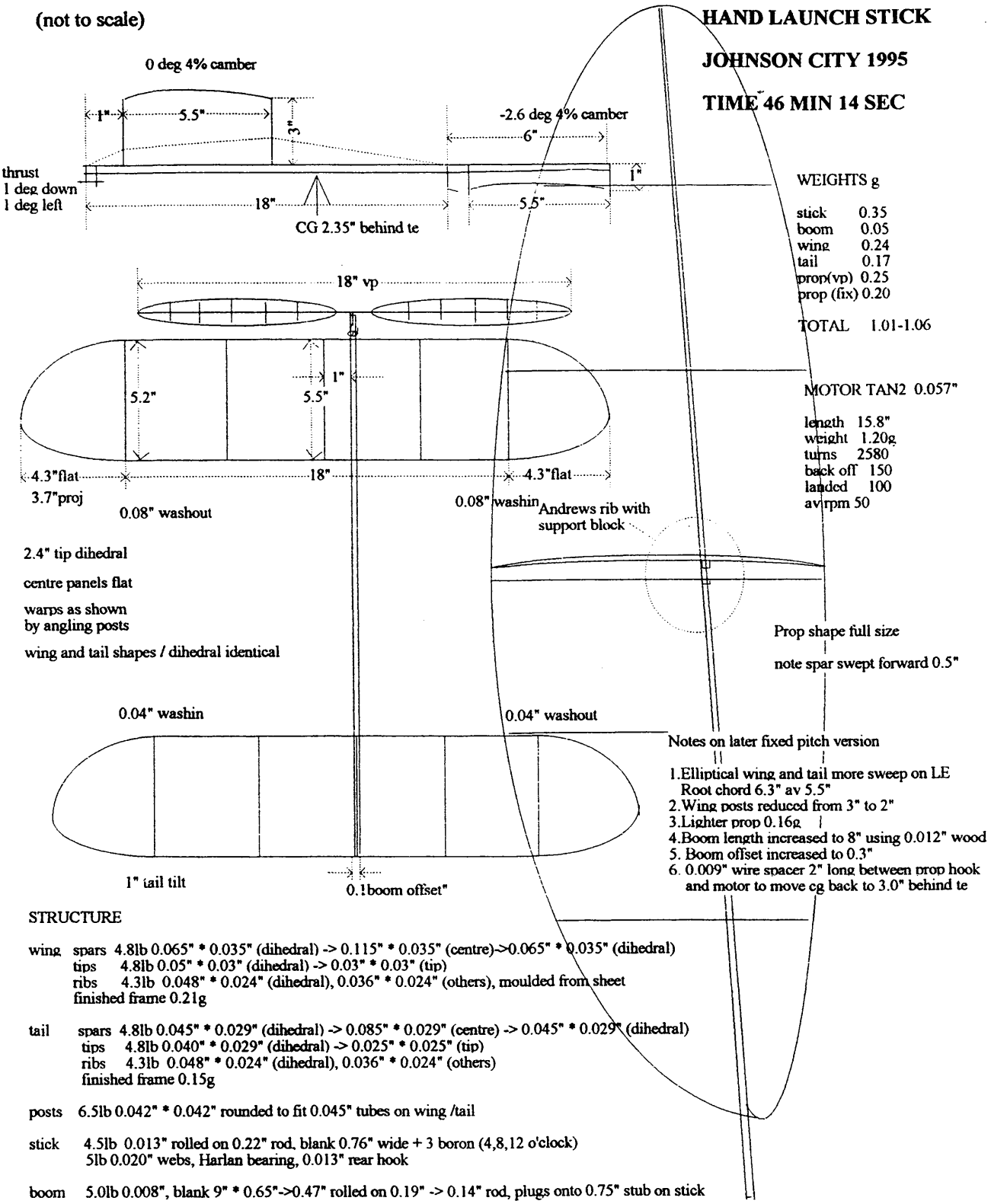
WINNER

HAND LAUNCH STICK

JOHNSON CITY 1995

TIME 46 MIN 14 SEC

(not to scale)



WEIGHTS g

stick	0.35
boom	0.05
wing	0.24
tail	0.17
prop(vp)	0.25
prop (fix)	0.20
TOTAL	1.01-1.06

MOTOR TAN2 0.057"

length 15.8"
weight 1.20g
turns 2580
back off 150
landed 100
av rpm 50

Prop shape full size

note spar swept forward 0.5"

Notes on later fixed pitch version

1. Elliptical wing and tail more sweep on LE
   Root chord 6.3" av 5.5"
2. Wing posts reduced from 3" to 2"
3. Lighter prop 0.16g
4. Boom length increased to 8" using 0.012" wood
5. Boom offset increased to 0.3"
6. 0.009" wire spacer 2" long between prop hook and motor to move cg back to 3.0" behind te

STRUCTURE

wing spars 4.8lb 0.065" * 0.035" (dihedral) -> 0.115" * 0.035" (centre)->0.065" * 0.035" (dihedral)
tips 4.8lb 0.05" * 0.03" (dihedral) -> 0.03" * 0.03" (tip)
ribs 4.3lb 0.048" * 0.024" (dihedral), 0.036" * 0.024" (others), moulded from sheet
finished frame 0.21g

tail spars 4.8lb 0.045" * 0.029" (dihedral) -> 0.085" * 0.029" (centre) -> 0.045" * 0.029" (dihedral)
tips 4.8lb 0.040" * 0.029" (dihedral) -> 0.025" * 0.025" (tip)
ribs 4.3lb 0.048" * 0.024" (dihedral), 0.036" * 0.024" (others)
finished frame 0.15g

posts 6.5lb 0.042" * 0.042" rounded to fit 0.045" tubes on wing /tail

stick 4.5lb 0.013" rolled on 0.22" rod, blank 0.76" wide + 3 boron (4,8,12 o'clock)
5lb 0.020" webs, Harlan bearing, 0.013" rear hook

boom 5.0lb 0.008", blank 9" * 0.65"->0.47" rolled on 0.19" -> 0.14" rod, plugs onto 0.75" stub on stick

bracing 1 of 0.0015" tungsten or 2 of 0.001"

prop spars 6.5lb 0.06" * 0.06" -> 0.025" * 0.025" rounded
outline 7lb 0.02" * 0.02", ribs 7lb 0.03" * 0.02" -> 0.02" * 0.02"Andrews
vp mechanism Banks' style but with wire hinges, 3 screw adjusters
bottom stop 29" pitch, top stop calc 36" pitch but looks more
blades covered polymicro

model designed to fit 27" * 9" * 7" box with 3 similar models (see NFFS Sympo 1993 for details)

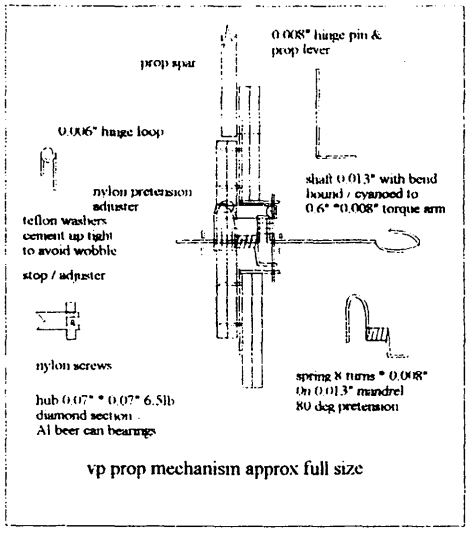
TRUE TANDEM F1D by Bernard Hunt

DESIGN and CONSTRUCTION

There are not too many true tandem designs (wing and tail the same span / area) in the world of aviation, either modelling or full size, and hardly any have been successful. Despite this, the "True Tandem" F1D design was a winner at the US and UK Indoor Championships in its first season. It is very similar in size (total area 265 sq. in.) and construction to my previous "No Hassle " unbraced F1D and shares the same advantages of being robust and easy to transport in small boxes.

I have experimented with different wing shapes (elliptical with more sweep on LE), wing chords (4.5"-5.5" av), wing post heights (1",2" and 3") and boom lengths (6" and 8"). It looks like the best all round choice is an elliptical planform, with stiff 2" wing posts and 8" boom. The CG position, which is quite critical for performance and stability, can be moved back by using a 2" * 0.009" wire spacer between the prop hook and motor . I use this method to compensate for heavy props or elliptical wings (which effectively move the wing backwards). I have had some problems in achieving a tight turning circle needed for some sites which was eventually cured by stiffening / shortening the wing posts and increasing the tail skew = tipfin offset from the 0.1" shown to 0.3" (this looks a bit odd but is theoretically sound and works well).

The key components are the main spars for the wing and tail. I use super quality 5lb wood tested for Young's modulus but if in doubt use 5.5 or 6 lb wood. It is also important to get the correct tapers. I cut an 18" wedge of 1/8" or 1/4" sheet model shop wood to 0.075"at the ends and 0.125 at the midpoint and then sand the middle 3" to 0.115 and the ends over the last 2" to 0.065". I strip off 0.035" spars using a mini version of Jim Jones stripper. The tail uses the same method but smaller sizes. You could cut the spars from thinner indoor stock in the normal way but you would not be able to select from hundreds of sheets. I use lap joints for fitting the main spars to the outside of the pre-made tips/dihedral rib and try and leave the spars under tension so they are trying to unspring - this helps avoid the starved horse effect.



vp prop mechanism approx full size

I used a vp prop at Johnson City because of the huge performance advantage (5min+) in such a low site. The key features of a vp prop are that it should be robust and easy to adjust rather than light. I used a standard Banks / Randolph mechanism but with wire pin and loop hinges instead of mylar, and I covered the prop blades in Polymicro. To avoid the shaft pulling out by the motor tension, I put a top hat bend in the shaft where it is kevlar bound and cyanoed to the torque arm. I used nylon screw adjusters for the top stop, bottom stop and spring pretension.

TRIMMING

1. Build the wing and tail flat and set the warps by angling the posts on assembly.

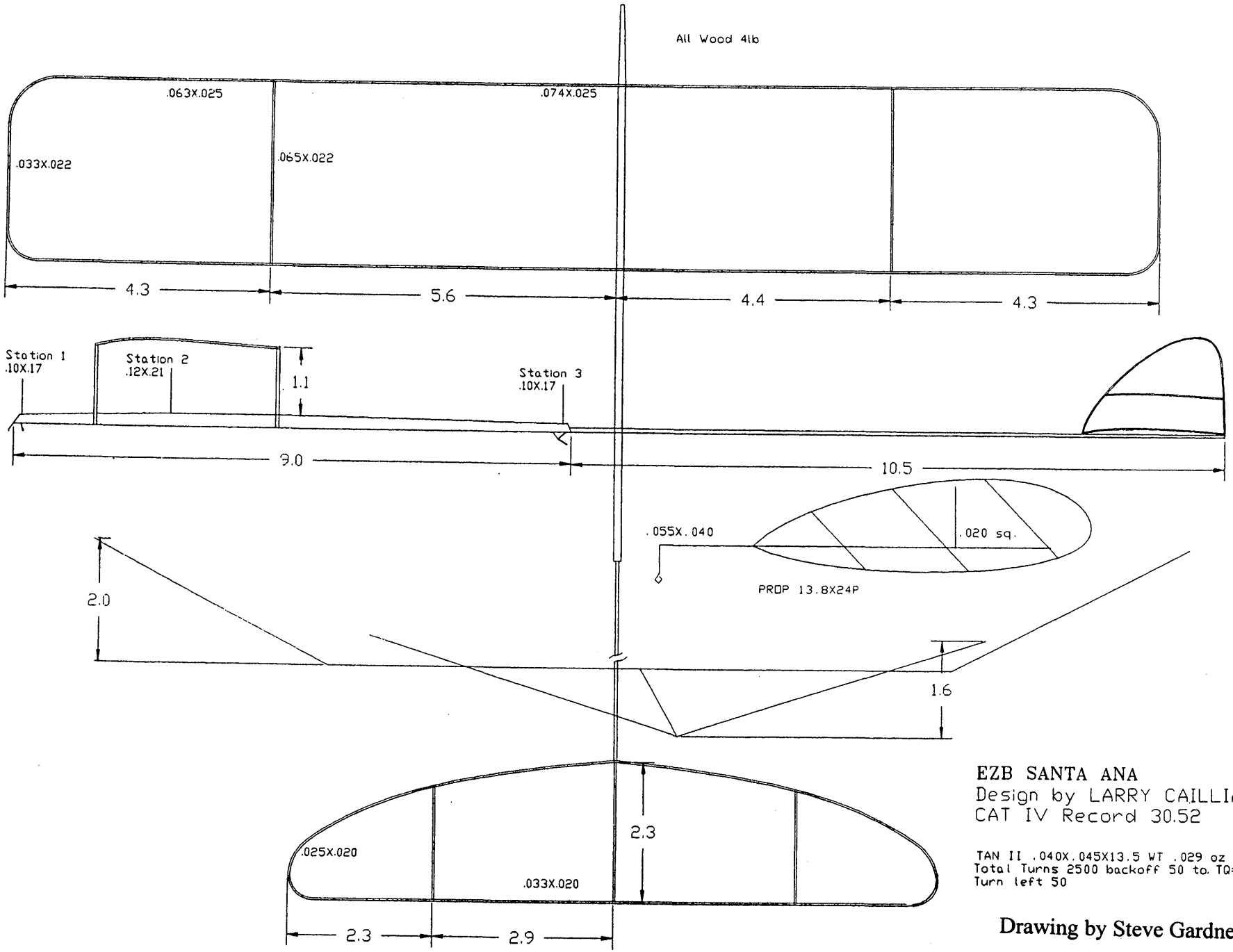
2. With no motor on, set the wing with slight washin on the right wing tip and the tail with slight washin on the left tip, 1" tilt, slight negative incidence (0.2" on rear post) relative to the wing and 0.3" skew = tip fin offset. Fit motor and check CG near 2.5" behind wing TE.

3. Test on a quarter motor with a three quarter length spacer and preferably a fixed pitch prop. Using low power (250 turns back off 25), adjust the elevation on the rear tail tube and the turn by tail tilt to give a nose up cruise and 30-40' circle. Now try high power (600 turns back off 30) and if the model tucks-in the right tip, correct with more opposite warp (loosen and reset one of the wing posts). Crabbing to the right requires less opposite warp. If the model goes flat /dives try more elevation (0.02" steps) but if this gives a stall at cruise you need to alter the effectiveness of the stick bracing by raising the brace point on the rear post in 0.1" steps and resetting the tail incidence again. Fixing a power stall is the opposite of this.

4. In the event that the model is just too sensitive to changes in elevation, then the CG is too rearward. The easiest way to change this is to use a 2" * 0.009" wire spacer at the rear of the motor or even better extend the tail boom by 1".

5. Now switch to a full motor and repeat the low power trimming but use a full wind (2500 turns) but big back off (600) to recheck elevation and circle at a safe height . Finally, you can try a full power flight but do be cautious and reduce the back off insteps down to the ultimate 150, adjusting elevation and tail tilt to give the perfect pattern and height.

6. For a vp prop, initial trimming is carried out as above on quarter motors with the prop locked into bottom stop or slightly above if you can. You then set the top stop roughly right (guess!) and adjust the spring pretension between flights till the cruise and letdown looks OK (more pretension makes the prop increase rpm sooner and slows descent). At this stage you can change the rubber size so that all the turns are used. Finally, you set the top stop so that you get the right height with a minimum backoff. I find it takes 10-20 quarter flights to get a prop anywhere near right and then at least 6 full motor flights to zero in fully. Clearly it is a big advantage to have a hall for long practice!



EZB SANTA ANA
Design by LARRY CAILLIALL
CAT IV Record 30.52

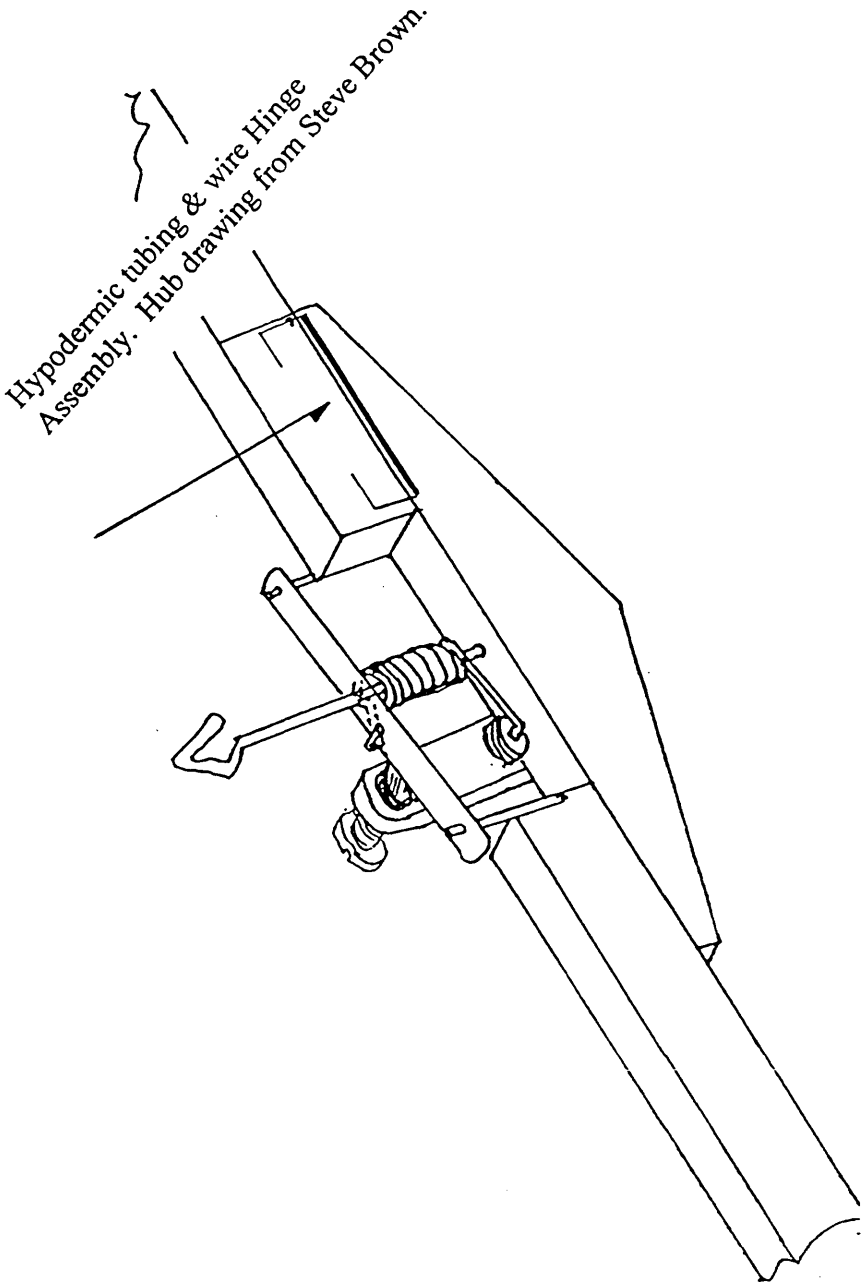
TAN II .040X.045X13.5 WT .029 oz
Total Turns 2500 backoff 50 to. TQ=2.0
Turn left 50

Drawing by Steve Gardner

Joshu V/P Prop Hinge

By Larry Coslick

If you use a V/P prop on your Penny Plane and the mono-coat hinges get loose after a few flights, try this idea from Gene Joshu. We are making the hinge assembly from .007 I.D. Hypodermic tubing and .007 music wire from Small Parts.* Tack the tubing to a piece of l/4 inch balsa with hot stuff and cut off two one/half inch lengths with a Dremmel tool. Insert the .007 wire in the tubing and bend as shown on the drawing. I hold the hub and prop shaft in alignment with two insect pins. Long pins can be fashioned using .015 wire. The tubing portion of the hinge has to be positioned .025 inches from hub trailing edge. Pre-glue the balsa with Ambroid. For a little extra security, I put a .007 wire staple 3/32 long and .008 wide where the wire attaches to the prop spar. Only one is needed and place it on the blade side of the hinge. Coat the tubing and wire hinge with three coats of thin Ambroid. My #2 Penny Plane uses .120" wide rubber and is launched with 1.4 inch ounces of torque. The hinges are as tight as the day they were installed.



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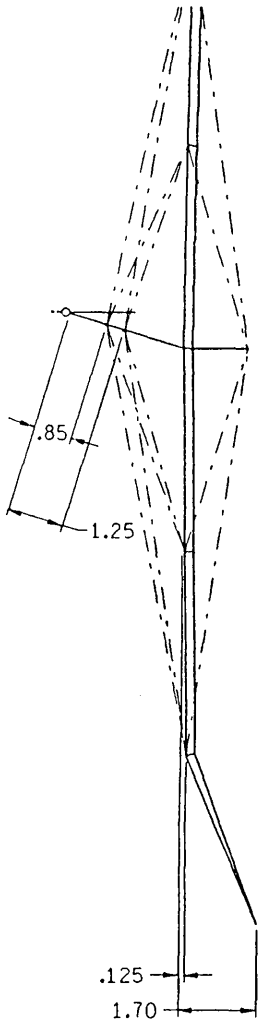
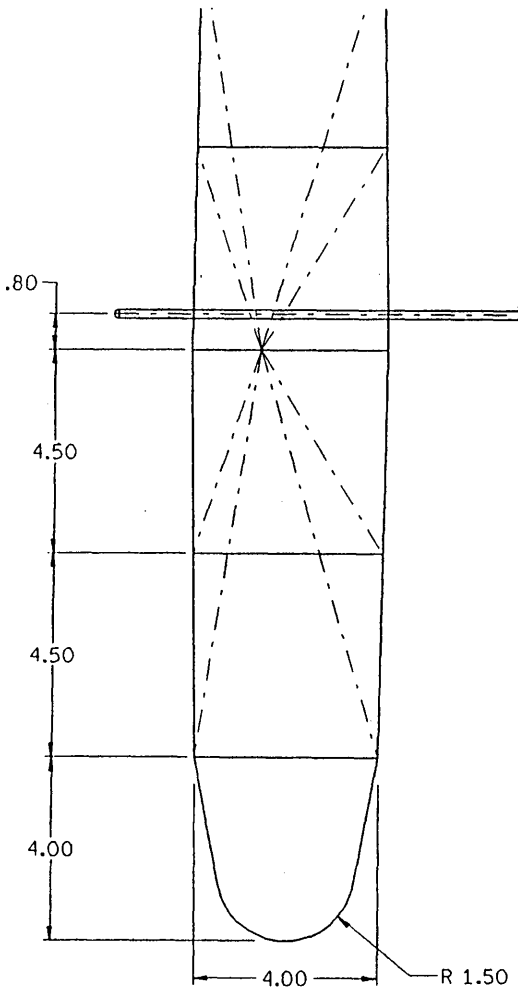




WEIGHTS (mg)

WING	280	WING DRY	135	WING COVERED	220
STICK	220				
PROP W/P	140				
STAB	80	STAB DRY	42	STAB COVERED	75
TAILBOOM	80	TAILBOOM W/O BORON	70		
TOTAL	800				

MATERIALS & DIMENSIONS

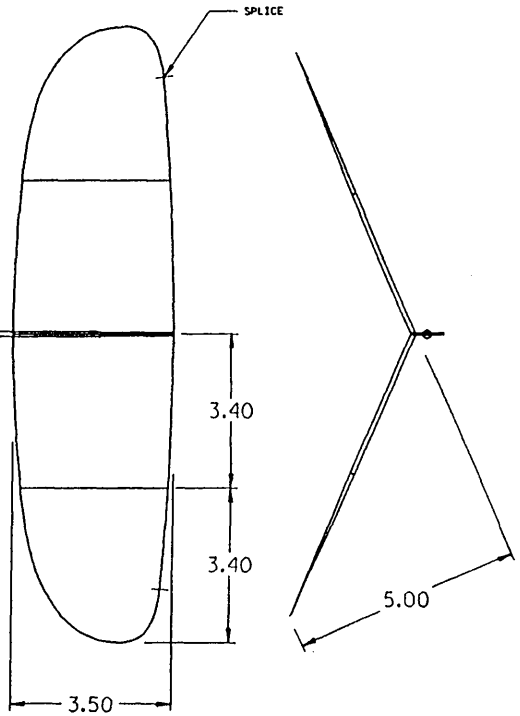
MOTOR STICK .011 3.75" .22 I.D.
- FRONT WEB: .018 X .75 LG 4.0"
- REAR WEB: .014 X .50 LG 4.0"
- REAR PLUG: .20 O.D. X .188 LG 3.5"
- POST: Ø .050 7"
- HOOK: Ø .010 WIRE
- BEARING: Ø .012 WIRE
- BORON @ 3,6,9,12 O'CLOCK
- BRACING: .0015 TUNGSTEN

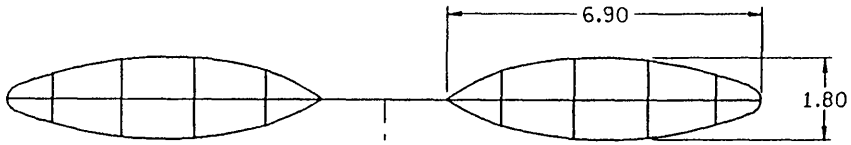
TAILBOOM: .007 4.0" .26 O.D. - .15 O.D.
- BORON @ 6,12 O'CLOCK

WING
- AIRFOIL: 5% ARC
- L/E SPAR: .028 X .040 3.5"
- T/E SPAR: .028 X .035 3.5"
  BORON ON TOP, BOTTOM, & OUTSIDE OF ALL SPARS
- RIBS: .022 X .040 4.5"
- TIPS: .023 X .040 / .023 X .030 6"
- CABANE: .030 X .045 / .030 X .030 5"
- POSTS: Ø .050 8"
- BRACING: .0005 TUNGSTEN

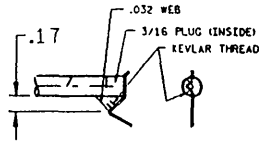
STAB
- AIRFOIL 2% ARC
- L/E & T/E SPAR: .021 X .045 / .021 X .030 4.3"
- RIBS: .018 X .040 4"
- ADJ. POST: Ø .039 5"

PROP
- SPAR: .010 X .080 / .020 X .020
  I.M.S. TAPERED STR. (LIGHT WT.)
- OUTLINE: .020 X .020 4.5"
- RIBS: .018 X .018 4.5"
- CESAR BANKS V/P PROP HUB

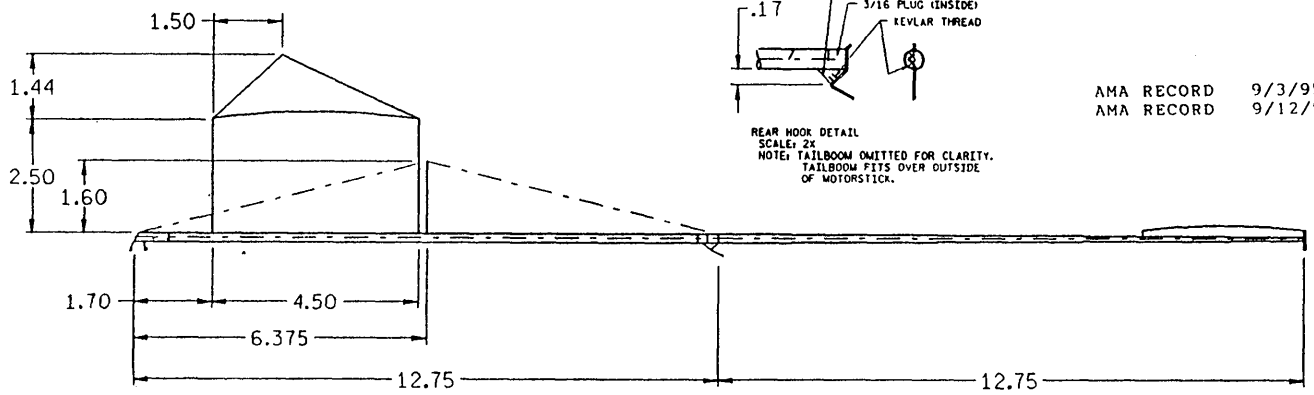


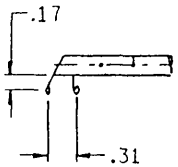


Ø 16.5 X 32 PITCH



REAR HOOK DETAIL
SCALE: 2X
NOTE: TAILBOOM OMITTED FOR CLARITY. TAILBOOM FITS OVER OUTSIDE OF MOTORSTICK.





PROP BEARING DETAIL
SCALE: 2X

AMA RECORD 9/3/95 CAT IV 41:48
AMA RECORD 9/12/95 CAT II 31:37

NOTE: WING & STAB SHOWN FLAT
SCALE: FULL UNLESS OTHERWISE NOTED

INTERMEDIATE STICK
PHŒNIX

BY: LARRY COSLICK
DRAWN: M.P.

444 Henryton So.
Laurel, MD 20724-2222
December 6, 1995

TO : Team captains and flyers in Japan vs USA F1d Postal
FROM : Tom Vallee
SUBJECT : Contest report - for 1995 F1d Postal Contest

First I would like to thank all the team captains and local contest organizers for their efforts. Contest pictures and results sheets are enclosed. Thanks to your efforts, we have had a great contest. Special thanks are owed to Doc Hacker and the members of the Cleveland Clowns team. They made a major effort in spite of terrible air conditions which caused massive model destruction.

We had a very strong contest. We expected this. Nobody expected the contest to be as strong as it turned out to be. The top flyers for both sides were simply outstanding! Eight flyers broke 30 minutes. To place ,- you had to break the world record. That's right! The top three flyers all broke Bob Randolph's Cat. I world record! That's what I call a tough contest! Special congratulations to record breaking flyers Kazumassa Kihara-1st (75:42) and Satoshi Kinoshita -2nd (75:11), and Steve Brown-3rd.(75:00). Two flight totals like these used to win in air docks.

The Japan - Kawasaki team, led by Kihara and Kinoshita, posted a record total for the contest. They won the team competition by a convincing margin. Bob Randolph's California Flyers made a very good showing for second place. Third place was won by the Japan - Tokyo team, lead by contest organizer Shigeyoshi Nonaka.

I hope you enjoyed flying with us in this friendly competition with the best Japanese flyers. I also hope you will fly with us again in the Easy B contest in 1996 and the next F1d contest in 1997.

Finally on behalf of the American flyers I should like to congratulate Mr. Nonaka and the Japanese flyers for an outstanding, record breaking performance and a well deserved contest win.

Best regards,

Tom

Thomas Vallee

JAPAN Vs UNITED STATES
1995 F1d POSTAL CONTEST

RESULTS BY TEAM

Site -Yoyogi Olympic Hall Japan - Kawasaki Ceiling - 26 ft.

1

Contestant Name	1	2	3	4	5	6	Best 2	Team Total
Kazumasa Kihara	35:53	15:05	27:44	37:04*	38:38*	—	75:42	
Satoshi Kinoshita	37:50*	37:21*	20::39	—	—	—	75:11	212:37
Masatoshi Misawa	29:35	00:54	31:51*	29:53*	08:59	—	61:44	

Site-Loma Linda Academy USA - California Flyers Ceiling 23 ft

2

Contestant Name	1	2	3	4	5	6	Best 2	Team Total
Steve Brown	33:55	37:38*	37:22*	—	—	—	75:00	
Bob Randolph	34:47	25:49	01:32	01:47	29:58	—	64:45	189:48
Bob Gibbs	27:04*	09:01	01:27	22:59*	22:18	—	50:03	

Site -Yoyogi Olympic Hall Japan - Tokyo Ceiling - 26 ft.

3

Contestant Name	1	2	3	4	5	6	Best 2	Team Total
Yoichi Ichiyama	00:29	31:03*	03:42	03:08	30:40*	—	61:43	
Yasutaka Tanaka	23:39*	20:20	20:20	07:48	31:52*	—	54:31	167:59
Shigeyoshi Nonaka	06:09	29:33*	18:21	12:31	22:12*	—	51:45	

Site Bedford Boys Ranch Gym USA - Great Plains/Southwest Ceiling 26 ft.

4

Contestant Name	1	2	3	4	5	6	Best 2	Team Total
Stan Chilton	33:11*	26:55	31:42	36:20*	—	—	69:31	
Jesse Shepherd	09:57	28:59*	08:25	22:08	27:15*	—	56:14	157:23
Jim Clem	15:00	16:23*	15:15*	—	—	—	31:38	

Site NASA Auditorium - GSFC USA - East Coast Ceiling 18.75 ft.

5

Contestant Name	1	2	3	4	5	6	Best 2	Team Total
Thomas Vallee	24:01	29:22*	26:23	29:12*	09:29	25:49	58:34	
Dan Belieff	21:32	24:40*	06:24	27:32*	—	—	52:12	145:30
Phillip Kleinert	12:57	17:03	17:05*	17:39*	—	—	34:44	

Sites Andrews Girls School/
Lake Erie College USA - Cleveland Clowns Ceiling 25 / 20 ft. —

6

Contestant Name	1	2	3	4	5	6	Best 2	Team Total
Larry Mzig	10:05	10:31	14:22	15:14	15:42*	21:11*	36:53	
Larry Loucka	12:51	15:53	17:25	14:28	18:04*	18:42*	36:46	98:29
Don Sluscarczyk	—	—	12:40*	12:10*	—	—	24:50	

7 Bill Hulbert * 17:17* 20:46* — — — — 38:03 38:03

* Local Contest Director allowed Bill Hulbert to fly as individual , ie team of one

JAPAN Vs UNITED STATES
1995 F1d POSTAL CONTEST

RESULTS BY INDIVIDUAL

Side		Contestant Name	1	2	3	4	5	6	Best 2
Japan	1	Kazumasa Kihara	35:53	15:05	27:44	37:04*	38:38*	---	75:42
Japan	2	Satoshi Kinoshita	37:50*	37:21*	20::39	---	---	---	75:11
USA	3	Steve Brown	33:55	37:38*	37:22*	---	---	---	75:00
USA	4	Stan Chilton	33:11*	26:55	31:42	36:20*	---	---	69:31
USA	5	Bob Randolph	34:47	25:49	01:32	01:47	29:58	---	64:45
Japan	6	Masatoshi Misawa	29:35	00:54	31:51*	29:53*	08:59	---	61:44
Japan	7	Yoichi Ichiyama	00:29	31:03*	03:42	03:08	30:40*	---	61:43
USA	8	Thomas Vallee	24:01	29:22*	26:23	29:12*	09:29	25:49	58:34
USA	9	Jesse Shepherd	09:57	28:59*	08:25	22:08	27:15*	---	56:14
Japan	10	Yasutaka Tanaka	23:39*	20:20	20:20	07:48	31:52*	---	54:31
USA	11	Dan Belieff	21:32	24:40*	06:24	27:32*	---	---	52:12
Japan	12	Shigeyoshi Nonaka	06:09	29:33*	18:21	12:31	22:12*	---	51:45
USA	13	Bob Gibbs	27:04*	09:01	01:27	22:59*	22:18	---	50:03
USA	14	Bill Hulbert *	17:17*	20:46*	---	---	---	---	38:03
USA	15	Larry Mzig	10:05	10:31	14:22	15:14	15:42*	21:11*	36:53
USA	16	Larry Loucka	12:51	15:53	17:25	14:28	18:04*	18:42*	36:46
USA	17	Phillip Kleinert	12:57	17:03	17:05*	17:39*	---	---	34:44
USA	18	Jim Clem	15:00	16:23*	15:15*	---	---	---	31:38
USA	19	Don Sluscarczyk	---	---	12:40*	12:10*	---	---	24:50

*** Local Contest Director allowed Bill Hulbert to fly as individual , ie team of one**

1996 MIDWEST "INDOOR" CONTEST
SCHEDULE

March 3, 1996
Cleveland Free Flight Society CAT III
Kent State University
8:00am to 5:00pm

March 9, 1996
Tulsa Glue Dobers CAT II
National Guard Armory - Tulsa
Bob Hanford Jack Hamilton
918-251-7564 918-665-8371

April 6, 1996
Topeka, Kansas CAT II
Jack F. Koehlar
3310 SW Eveningside Rd Apt 15
Topeka, KS 66614-3726

April 21, 1996
Okie-Fliers CAT II
National Guard Armory)-City
Contact Edsel Ford
405-691-5411

The Kibbie Dome at Moscow, Idaho Will Host FID World Championships

INAV has just learned that the 1996 FID World Championships are to be held at the Kibbie Dome, Moscow, Idaho. The dates are August 5-8, 1996.

Preceding the World Championships are the Kibbie Dome Annual to be held on August 1, 2 & 3, 1996 and the 2nd International EZB Contest on August 4, 1996. The 4th is reserved for EZB and AMA rules will apply for EZB models only. The Dome hours for the Annual will be from 8:00 am to 8:00 pm. Catapult and Hand Launch Glider fliers will have the floor from 8:00 am to 9:30 am each day.

Immediately after the World Championships, Andrew Tagliafico invites everyone to travel to Tillamook, OR for a 3-day fly-in. Contact Andrew:

Andrew Tagliafico
10039 S.W. Quail Post Road
Portland, OR 97219
503-452-0546
****

If anyone feels their expiration date is not correct, please let us know.

We are desparate for materials, plans and building articles. Don't be bashful - send them in!

Feather Shooter

Category I Indoor Record Holder

By Bob Bienenstein, AMA 268

This low-ceiling catapult glider is a takeoff on my Little Shooter Category III record holder. I have been flying variations of this design since '85. The first designs were super sensitive to adjust before updating to the present design by addition of the pylon, a la Stan Buddenbohm The wing is the flex-flap design pioneered by Mike and Stan Stoy.

Unlike other catapult designs, this one is held by a finger grip under the wing, which was done to keep the total weight down to the 2 grams projected minimum weight needed for record flights. This also keeps the rear light, which helps the roll-out. And that is desperately needed in low-ceiling flying!

Assembly and trimming

Key weights to shoot for in building your version of the Feather Shooter are:

Wing	1.1 grams
Tail	0.08
Body	0.55
Clay	0.20
Total	1.93 grams

All parts are assembled with Tite Bond aliphatic resin glue except for the small carbon-fiber reinforcement on top of the wing at the center. This piece is used as a rip stop and is attached with cyanoacrylate. Note that this area should be checked for cracks when you're flying the glider.

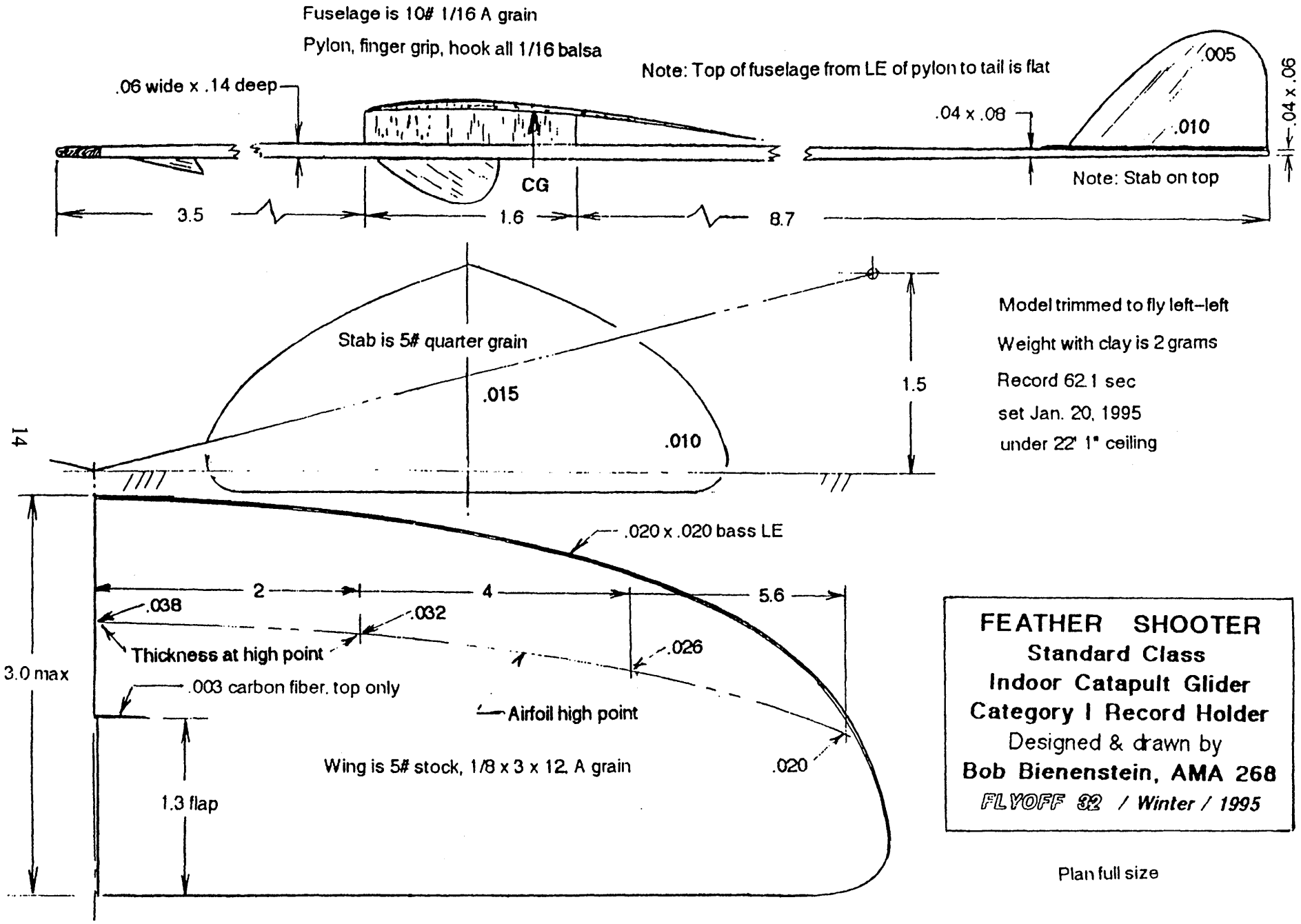
If you are not familiar with the pylon trimming method, start the assembly by putting together all body parts (including the finger grip and rubber attachment wedge) and the tail surfaces, but excluding the pylon. Make the pylon from 1/16" 5-6# balsa approximately 1/4" high. Using Tite Bond (aliphatic resin) glue, attach the pylon to the wing, making sure that the flaps are warped down approximately 1/16".

Then tape the pylon-mounted wing at the location shown and add weight to get the CG location shown on the plan. Now you adjust the incidence angle in test flights (by carefully sanding the bottom of the pylon). You'll know you've got it right when you can firmly hand launch the glider in a level launch and get a smooth recovery, and now you can glue the pylon to the fuselage.

Final tweaking should produce a left launch and a left glide with a near-vertical launch.

To catapult the Feather Shooter, I use a piece of bamboo 1/16" x 1/8" x 5-3/4" with a wire loop on the end. Attached to this is a loop of FAI Tan rubber .030" x .040" x 8" long.

Feather Shooter's record two-flight total of 62.1 seconds was set Jan. 20, 1995, in the gymnasium of the Adrian (Mich.) High School, which has a ceiling height of 22 feet 1 inch. Now the search is on for a gym with a 26-foot ceiling!



Model trimmed to fly left–left

Weight with clay is 2 grams

Record 62.1 sec

set Jan. 20, 1995

under 22' 1" ceiling

FEATHER SHOOTER

Standard Class

Indoor Catapult Glider

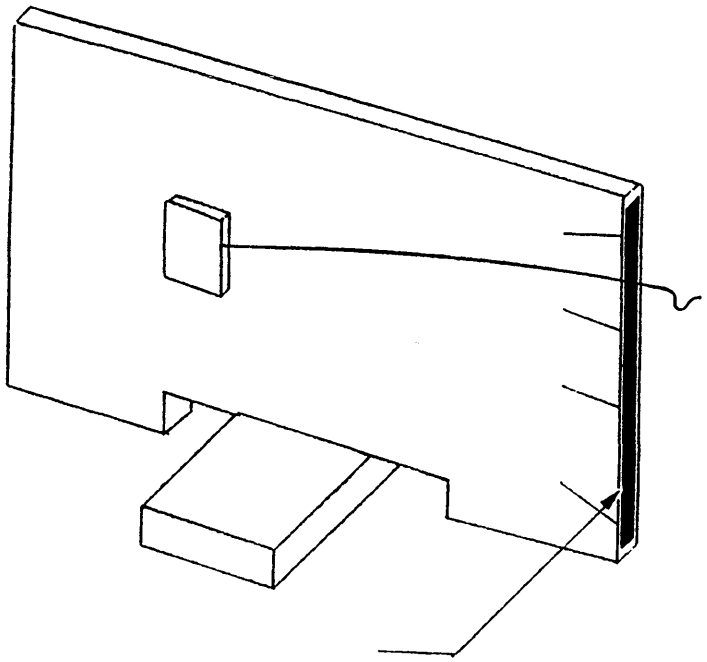
Category I Record Holder

Designed & drawn by

Bob Bienenstein, AMA 268

FLYOFF 32 / Winter / 1995

Plan full size



Dr. Vernon Hacker suggests applying sticky back magnetic tape to your scale to dampen wire.

1995 AMA RECORD UPDATE

OPEN CLASS

09/21/95 ROY WHITE
CAT II ORNITHOPTER 10:01

10/1/95 LARRY CALLIAU
CAT IV EZB 30:52

10/01/95 LARRY COSLICK
CAT I ROG STICK 13:35

O10/01/95 ROY WHITE
CAT I ORNITHPTER 9:01

10/22/95 STEVE BROWN
CAT I FID 37:38

10/26/95 LARRY COSLICK
CAT II PENNYPLANE 13:54

11/02/95 LARRY COSLICK
CAT II ROG STICK 13:44

11/05/95 STEVE BROWN
CAT IV FID 52:46

12/30/95 ROY WHITE
CAT III ORNITHOPTER 13:22

HEARTY CONGRATULATIONS TO ROY WHITE, WHO NOW HOLDS RECORDS IN ORNITHOPTER IN ALL CATEGORIES, INDOOR AND OUTDOOR! WE'RE VERY PROUD OF YOU, ROY!

****

ATTENTION ALL FLYERS, AMERICAN, CANADIAN AND OVERSEAS.

INAV is interested in publishing all new indoor records for your respective countries. Please include date, flier's name, ceiling height, type of model and time. Send information to:

Roy White
1025 Cedar Street
Catawissa, MO 63015

FAI Model Supply has moved:

P.O. Box 366
Sayre, PA 18840-0366
Phone/FAX 717-882-9873

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LAKEHURST, NEW JERSEY

Gary Underwood advises us of the 1996 dates for Lakehurst. This is the earliest we have ever received this notification. The reason was a very successful negotiation between the Navy and ECIM.

A proposal to move our activities to a yearly format was unanimously accepted. This approval will yield us 110 flying dates in Hangar 1. Activities will begin on 1/06/96 and end on 1/29/96.

Membership dues for 1996 will remain at $40.00 per family and should be mailed at your earliest convenience. This will allow us to generate our 1996 membership list for the Navy's files. Checks should be made out to ECIM.

Gary visited Hangar 1 just prior to Christmas and reports several improvements taking place. The renovation of the northern wall is now air tight. All doors and cement block are in position providing new classrooms for the Navy. This should greatly reduce the drift from side to side. The sliding truck door entrance is temporarily sealed for asbestos removal in the southern wall. This area will be improved in 1996 in conjunction with the Votech School. While the truck door is impassable, the Navy is utilizing another truck door at the northeastern portion of the hangar.

With your help, he hopes to incorporate several new activities in 1996. He will be holding short informal club meetings during our flying sessions. How does the third Saturday of every month sound?

He will establish AMA sanctions beginning on January 27 & 28 and will continue through December 29.

As time permits, he will assemble your membership packets.

Gary Underwood
East Coast Indoor Modelers
24 Kennebec Court
Bordentown NJ 08505

****

Charles Rushing requests your help to fund the publication costs for a book he is writing entitled:

THE WAKEFIELD INTERNATIONAL CUP 1911 to 1995
A History of the Events.

Much of the information now available is based upon hearsay, word -of-mouth anecdotes, and very sketchy data. This book is entirely the emotional experiences of those who flew in the Wakefield Event. This is not a technological treatise. The book will contain the following:

-160 pages of text and drawings (8.5 x 11)
-Rules and outline of Rules 1928-1995
-List of Winners (corrected) and anecdotes
-43 Chapters - one for each Contest 1911-1995, including Graphics of Winning Aeromodel and contestant
-List of Team Members throughout the world who flew in more than one Wakefield International Cup Event
-Publication date 1996

Did you know that:
the original Wakefield Rules allowed gas-powered models of any size weighing up to 11 lbs?
Joe Ernhardt was only 19 yrs old when he won the Wakefield Cup in 1930?
Gordon Light is the only proxy Wakefield Cup Winner ?
Aarne Elilia's 1949 Winning aeromodel was

built in 1939 ?
There were three Wakefield Champions in 1953, and that all of their names have never been put onto the Wakefield Cup?
The original Wakefield Cup was lost somewhere in Holland since 1914? (Wouldn't it be a miracle to find it?) These are the kind of facts that are detailed in the book. Without financial help, he will not be able to publish this history.

Those who contribute $40.00 or more towards the publication of the book will have their name and location listed in the book, and will receive a first edition signed copy of the book. He would like to publish now, before the end of the 20th Century, the Century of the Wright Brothers flight and the winning 1911 flight of E. W. Twining with a Canard that won the first Wakefield International Cup.

If you are interested, contributions may be sent to:

Charles Rushing N6053
P.O. Box 1030
Sutter Creek, CA 95685
(209) 267-0866
****

THE MYLAR DOLL
(A Limited PennyPlane)

By Vladimir N. Linardic

Like most successful indoor designs, the Mylar Doll has been developed through a series of models started in 1990, when I started flying indoor models. The Mylar Doll is the 7th model in its series. On each model built in this series, small changes were made until I have arrived at the model being presented here, the 1995 Mylar Doll. The Mylar Doll has proven itself in competition right from the start. First, the model was entered in the Canadian limited penny plane contest. It flew a 9:01 time to take second place. Then in June, 1995 at the USIC in Johnson City, it flew a 15:53 flight to win the event and also set a new site record. The same flight also set a new Canadian open CAT IV record, beating the old record by a wide margin. The old record was 13:46. Then a month later, at the Canadian indoor nationals held at the 75 ft high air Canada hangar in Mississuaga, the Mylar Doll flew a 12:45 flight to win and set a new Canadian Open CAT III record. Jack McGillvaray was second with a flight of 12:32.

The motorstick is built from stiff, yet light stock. The particular piece used was 4.6 lb density. It is cut, then sanded so that at the center, it measures 0.250" wide, and 0.385" deep tapered to 0.150" square at both ends. The bearing and hook were formed from 0.016" dia. wire (my usual practice). The bearing is mounted with 0 deg. down and 2 deg. left thrust. The bearing and hook are glued in with epoxy diluted with methyl-alcohol 50%.

The tail boom is made from stringy, but light tapered stock. It measures 0.150" x 0.150" tapered to .045" x .045". It is glued to the motor stick with 0.125" negative incidence using epoxy prepared as described above.

The wing is build around cardboard templates. This is the most accurate way of constructing flying surfaces and when they are brought back for repairs, they can be carried out accurately. The wing spars are 0.060" x 0.060" 7.2 lb density, "A" grain wood. The ribs are cut from 0.030" thick 5.0 lb density "A" grain wood to a depth of 0.060",with a 12" arc. I make my rib templates from 0.125" thick aluminum.

This extra thickness helps to keep the blade vertical when cutting ribs. These templates, when used with the Jim Jones rib index, ensure that each rib cut is usable. The tip leading edges are laminated from 0.020 thick 4.5 lb density, "A" grain wood cut to 0.060" spar width. They are laminated using 75% thinned white glue. The rest of the wing structure is assembled with duco cement thinned 50% with Lew Gitlow's cement thinner. Before removing the wing from the cardboard template, the leading edge is rounded with 600 grit sandpaper. The wing is covered flat with polymicro polycarbonate film attached with #77 "3M" spray adhesive. Be very careful not to apply too much cement. One pass over the structure is sufficient. At this point the polyhedral is built in and the covering at the polyhedral breaks is pulled tight by running some 75% thinned white glue over these places with a small brush. The wing posts are made from 0.060" square very hard stock rounded. These are glued to the wing to give 0.125" washin on the inboard tip break, but tips are parallel. The wing post braces are made from 0.025" thick 7.0 lb density wood cut square.

The stab follows the same construction techniques as the wing except that the wood sizes are different. The spars are 0.045" x 0.045" 6.8 lb density. The ribs are cut from a 0.030" thick, 5.0 lb density wood to a depth of 0.045". The tip laminations are from three pieces of 0.015" x 0.045" deep 5.0 lb density laminated as described above. The stab is attached to the tail boom with 0.250" tilt for left turn and the outboard side has 0.060" washout to aid turn under high torque conditions.

The prop plays a crucial role in the way this model flies. The blades are cut from 0.035" thick 3.9 lb density, "C" grain wood and an airfoil, sanded in with the high point being at the spar location. The blades are formed on one of the Jim Jones EZB cork forms to achieve 0.375" undercamber. The spar is made from 0.125 square wood, very hard, rounded and tapered to 0.030" at both ends. The hook is formed in my usual manner from 0.016 dia. wire. Then, the blades are formed on a 19" helical pitch block and glued to the spar. The spar fits in a slot in the blades and is sanded flush with them in the front face of the blades only, while leaving the back as is. During flight tests, the blades are sanded down as required to obtain the required flare. This takes time and very careful observation of the prop during flights. I also use a static prop testing apparatus on my work bench to fine tune the prop pitch change.

The model used a piece of 0.084" x 21.4" long piece of TAN II (Aug '93) rubber, wound fully with no back off. The Mylar Doll climbed all the way up, but never hit the ceiling at Johnson City.

This model has given me great satisfaction and pride. If you decide to build your own Mylar Doll, I wish you the best of luck.

If you have any questions, don't hesitate to contact me:

Vladimir N. Linardic
3620 Kaneff Cres. #704
Mississauga, Ontario
L5A 3X1 Canada

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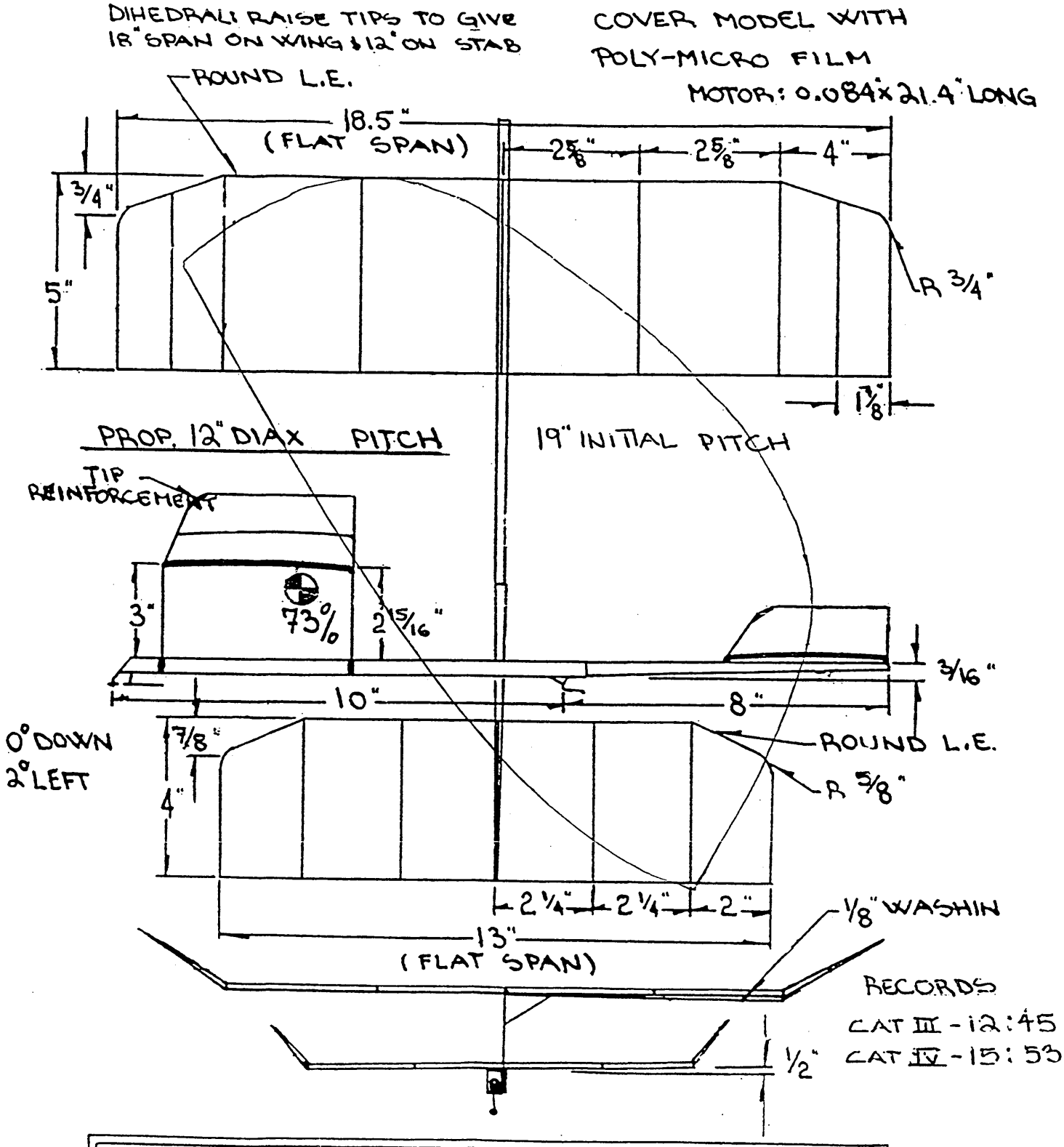

RECORDS
CAT III - 12:45
CAT IV - 15:53

"MYLAR DOLL" - A LIMITED PENNY PLANE - DESIGNED AND DRAWN BY: VLADIMIR N. LINARDIC JAN. 2/95

AMA Indoor Nationals/United States Indoor Championships - 1996 Johnson City, TN

7:30	10:00	12:00	2:00	3:00	5:00	7:00	10:00
Wednesday 29 May, 1996 Practice Day	IHLG Std Cat Gld Unl Cat Gld Unl Rbr Spd	All Scale events FAC & AMA plus No-Cal	P'Plane Unl P'Plane Manhattan Autogyro	P-24 Mass launch *	Mini-Stick Ornithopter Helicopter	Int Stick ROG Stick EZB Pro - 20	F1D HL Stick 35 cm Cabin ROG

7:30	11:30	2:30	3:30	6:00	10:00
Thursday 30 May, 1996	Hand launched Glider Standard Catapult Glider Unlimited Cat. Glider Unlim. Rubber Speed *	Intermediate Stick Helicopter Ornithopter Stick ROG	No launch **	Intermediate Stick Helicopter Ornithopter Stick ROG	F1D Hand launched Stick Pro - 20 * Autogyro Cabin ROG

7:30	11:30	2:30	3:30	5:15	6:30
Friday 31 May, 1996	FAC Scale * Bostonian Pistachio * High Wing Monoplane *	Pennyplane Manhattan Bostonian mass launch at 11:30 *	No launch **	Pennyplane Manhattan		Banquet

7:30	11:30	2:30	3:30	6:00	10:00
Saturday 1 June, 1996	Golden Age * Coconut Scale * No-Cal Scale * Peanut Scale F.R.O.G. *	Limited Pennyplane Coconut mass launch at 11:30 *	No launch **	Limited Pennyplane	F1D Hand launched Stick Pro - 20 * 35 cm *

7:00	10:30	11:30	2:00	2:30	4:00	6:00
Sunday 2 June, 1996	Mini-Stick; Kit plan Scale AMA Scale Mini-Stick mass launch at 10:45		EZB	No launch **	EZB	Clean-up. . Building must be cleared by 6:00 pm!!!

* Non - AMA events ** Retrieval starts with the last plane down.

Source - SAM '86

WALLY MILLER INTERNATIONAL EZB CONTEST

AUGUST 4, 1996 SUNDAY 8:00AM TO 8:00 PM KIBBIE DOME MOSCOW, IDAHO

ENTRY FEE $35 DUE BY 6/12/96

This fee is based on the exclusive use of the Kibbie Dome for this very special event.
No other model, other than EZB will be allowed to fly.
Please make checks payable to EZB International and mail to Larry Coslick

TROPHIES WILL BE AWARDED TO THIRD PLACE

RULES:

1. The best two of six flights will win. Six rounds will be flown at one-hour intervals, with 1/2 hour between rounds.
2. The start time will be 9:00 am. The last round will start at 4:30 pm.
3. The official flight time will be one minute. Two attempts will be allowed to make one official flight.
4. Three official flights (of at least 15 minutes each) must be made to qualify for the championship.
5. AMA rules on model only. Contestants may process three models.

CONTEST SPONSORS

Larry Coslick
4202 Valley Crest Hills
St. Louis, MO 63128
314-892-3803 (After 10:00 pm)

Wally Miller
3498 E. Stiles Ave
Camarillio, CA 93010
805-484-2330

EVERYONE WELCOME
MAKE PLANS NOW TO FLY WITH US!

1996 International Mini-Stick Postal Contest

The St. Louis Thermaleers invite all indoor flyers to take part in the 1996 International Mini-Stick Postal Contest to be held over the winter period. The rules for the contest will be as follows:

1. The contest is open to Indoor models that comply with the Living Room/Mini-Stick rules.

2. Contest flights are to be made between 1 Jan., 1996 and 31 Mar., 1996.

3. Any number of flights can be made at any number of sites.

4. All contest flights to be timed by someone other than the flyer.

5. All contest flights to be recorded on an official Results Form. (Included in this issue. Copies can be made.)

6. Best single flight time wins, after the flight time has been corrected for different ceiling heights. Ceiling height to be measured as per the FAI, but with a 5 metre diameter circle. The correction factor is 627 divided by (167 plus 46 times the square root of the ceiling height in feet). The time in seconds will be multiplied by this to give the corrected time.

7. Prizes will be awarded dependent on the number of contestants.

8. All Results Forms to be returned no later than 10 April, 1996 to the address below:

9. Entry is free to all contestants.

10. Results will be sent if a S.A.S.E. is included with the Results form.

Send your results to:

Larry Coslick
4202 Valley Crest Hills Drive
St. Louis, Missouri 63128

MINI-STICK MODEL RULES

Monoplane, max span	7.0 in.
Max Wing Chord	2.5 in.
Stick Length	5.0 in.
Max Model Length (less prop)	10.0 in.
Stab (Tail) Area	Max = 50% of Wing
Covering	Plastic/Paper. NO microfilm
Propeller	Wood Prop, 7" dia.max.
Minimum Weight	(0.43 gms)0.015 ounces

Flying

Steering	4 Ten Second Steers*
Attempt	15 Seconds or more*

*Special rules for very small rooms only! (Living Room flying.)

KIBBIE DOME ANNUAL '96

ISSUE #87 MAY, 1996

INAV
Indoor News and Views

AUGUST 1, 2 & 3 1996

UNIVERSITY OF IDAHO

MOSCOW, IDAHO

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CHILTON'S CORNER
By Stan Chilton

MAXIMIZING YOUR MODEL'S FLIGHT POTENTIAL

Outside the few times your model encounters really good buoyant air, everything you can do to maximize your model's performance has already been done when your model leaves your hand on launch.

Everyone will agree that the lighter you can build your model the higher its potential performance, and this is certainly true. A good stable design also helps.

But often overlooked is accuracy of construction and trueness of the flying surfaces. Accuracy of construction and light weight go hand in hand and is worth a study all on its own.

Accuracy in model alignment is critical to squeezing those extra seconds (and minutes) out of your model's potential.

It is important, when building, to have as flat a surface as possible to work on. I have found glass to be easily available, fairly flat and easily cleanable of cement blobs, etc.

I use ¼ to 5/16 sheet glass as a surface on my work benches. The work benches are 3' x 6' and 3' x 8' folding legged banquet tables. They are sturdy and will last a lifetime. For the size of my work shop I put 2 tables "L" shaped in one corner of the room and a separate 3' x 8' table on the other side of the room.

Your local glass company will probably have on hand what they call "salvage plate" glass. They end up with pieces large enough to cut to your desired dimensions when they replace those very large outside display windows in department stores and other retail businesses. Sometimes just a corner is cracked in one of those large display windows, but they replace the whole thing.

I get the sizes I want with the edges bevelled for less than $20 per sheet per table top.

While at the glass company, pick up some various size pieces of 3/16 or ¼" glass, big enough to contact cement wing stab and rudder poster board templates on. For an F1D wing of 9" chord I use a piece of glass at least 3½" larger all around than the template, for a glass size of 16" x 33". To save money I generally bevel the sharp edges myself with a diamond file or 180 grit emery cloth, carefully.

I build and cover the microfilm and poly-micro covered wings, stabs and rudders right on the glass and around the templates.

Find an old time printing company and see if you can find some lead printers spacers, or slugs about ¾" x 3/8 and 1"x1"x¾. These are used to hold the balsa outlines tight to the poster board template. They can also be used as a square and prop to keep ribs vertical.

But after the construction and covering comes the really critical point. I'm sure everyone uses bracing jigs, assembly jigs, etc. to assemble the model with the desired wing wash, decalage and plan form alignment.

What if the jig isn't perfectly true?

This time we pay a visit to a retail billiard outlet or company that handles pool tables. We're looking for a used piece of slate that will be large enough to use as a "flat plate" large enough to true up the largest jig you ever anticipate building. Typical used slates may have a broken corner, damaged edge, etc. that the billiard company can't use but the remaining intact piece is big enough for our use. I found a piece of slate about 4' x 3' x 1⅛" thick. It must weigh around 150 plus pounds, but my steel folding legged banquet table holds it so far.

By placing your jig on the horizontal slate, weight the bottom of the jig down with whatever is handy to keep it from moving. By measuring the various parts of the jig's height from the slate, one can determine the jig's accuracy. I generally measure the distance from the slate to the bottom of the leading and trailing edges at the wing center and left and right dihedral breaks. By comparing these dimensions you can ascertain the wing wash and trueness of these surfaces. Any unintended warps or crooked spars add drag and detract from potential flight time. It is well worth the extra effort for dedicated indoor modelers to insure the utmost accuracy of their model's construction and assembly. The pay off is more consistency and higher flight times.

1996 INTERNATIONAL MINI-STICK CONTEST

Congratulations to the winners. We had 95 contestants from 8 countries and Walter Vangorder took top individual honors for the third straight year.

The most difficult task in compiling the scores was trying to figure out how the contestants spelled their names. If your name is misspelled it is because we could not read your writing. In the future, please print your name clearly and also include your address.

Seven awards will be given, one to the overall winner, three places for USA winners, and three for international winners.

Results are on page 15,16

F1d Boom/Fin/Stabilizer Construction

by Steve Brown

Completing the fuselage of an F1d involves the same tradeoffs between weight and strength as does motorstick construction. A well built model will maintain its adjustments under power, accept the stress of ground handling and still meet a weight target. The comments below refer to an F1d with a suspended, unbraced parabolic stabilizer. Many of the techniques also apply to braced stabilizers. I favor unbraced stabilizers because, in my experience, they recover from tailslides better than braced stabilizer models and they are easier to build to weight.

Boom wood selection - The factors previously discussed for motorstick wood selection apply to the wood for tail-booms: uniform thickness, straight, consistent "C" grain, and sheets that lie relatively flat when placed on a flat surface. I say "relatively" because the majority of wood, when cut to .007" or .008", displays some tendency to curl or twist. More latitude in sheet weight exists when selecting boom wood. Booms can be built with or without boron reinforcement. Look for .007" thick wood that weighs .0060-.0070 oz, but good booms can be built of heavier wood, up to .008 oz, without boron.

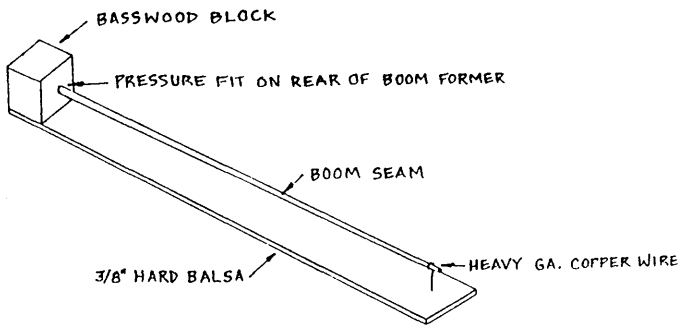
Rolling the boom - I use a 22" long former tapering from .235" to .125". This gives an i.d. of .160" at the small end of a 13" boom. The idea for using a low-taper former originated with Stan Chilton. It is not only stiffer, but it has less tendency to split at the small end if a model tailslides. You can obtain low taper formers by looking though the fiberglass rod components at a fishing equipment shop.

I usually use the traditional method of cutting an exact size tapered blank. Assuming that you are using a .250" i.d. motorstick, locate the .235" o.d. point on the boom form. Wrap a piece of .125" wide masking tape around the .235" diameter. Measure 13" down the form and wrap a second .125" piece of tape around the form at that point. Slice through the overlapping tape and remove both pieces from the former. Mark two points 13" apart on the sheet of wood and trim one edge of the wood straight. Using magnification, place the .125" strips of tape on the wood perpendicular to the straight edge. Position a straightedge adjacent to the ends of the tape. Allow about .015" extra width to compensate for shrinkage. Cut the second side of the blank. I usually make the blank about .250" longer on both ends than my target length, to allow for an exact fit with the motorstick i.d.

Soak the wood for 15 minutes in cool water. Cut a piece of 00 Silkspan to a wedge shape about 2" wide at the wide end, 1.25" wide at the narrow end, and 14" long. Place the Silkspan on a flat work surface and soak it with water applied with a 1" wide brush. Brush out all the wrinkles. Position the boom former along the bottom edge of the Silkspan and attach the Silkspan to the former. Roll the former about 2/3 turn. Place the wood blank adjacent to the former and roll. Bake at 150 degrees F for 20 minutes.

Carefully remove the blank from the former. 00 Silkspan is easier to separate from the wood than is Japanese tissue. The tube will almost always have a slight curve. If the tube is very curved or "doglegged" discard it. It is impossible to straighten a boom that is excessively curved.

Gluing the seam - Spray the former with aerosol Teflon and allow to dry. Place the former in a simple jig like that shown in the sketch. Weigh the rolled balsa tube and then place it on the former. Using the wire loop pull the small end of the former down about .180". Don't overdo it. The bend helps counteract the tendency of the glue seam to warp the boom. Position the wood with its curvature opposed by the bent former.



Recently I have been using Stan Chilton's method of applying glue to seams with a brush. Use Ambroid thinned 50/50 with a mixture of 1/2 acetone, 1/2 lacquer thinner to retard drying, and 4 drops of TOF to the ounce of thinned mixture. The disadvantage of the brush technique is that so little glue is applied that it tends to dry before the joint can be made. If more is applied it is easy to glue the wood to the former. By slowing the drying time and spraying the former with a non-stick coating these problems can be minimized.

Begin gluing in the middle of the tube, aligning the edges to produce a straight seam. When complete, leave the tube on the former for 6-8 hours to allow the glue to dry completely. Weigh the glued tube, subtract the weight of the bare rolled tube and you should have a seam weight of .0002-.00025 oz.

Applying boron - Remove the tube from the former. Now is the time for a "judgment call." If the tube is straight and seems very stiff, omit boron. Tubes that don't require boron weigh about .0030-.0033 oz. for a 13" length. If the tube is still curved or is very light (.0027-.0030 oz) boron is usually necessary.

Using the same jig as described in my motorstick construction article I apply .003" o.d. boron (from Model Research Labs) to the top and bottom of the tube. Apply the boron to the side away from the curve first, using thinned Ambroid with TOF in a 26 gauge hypodermic needle. Two boron strips will add about .00035 oz.

Building the suspended, unbraced stabilizer - Obtain .028 - .032" thick, 24" long wood from Indoor Model Supply. Grade the wood to find a sheet of about 5.5 lb. density that is stiff and springy. Place the wood on a flat surface, mark the center with an indelible marker and begin sanding from the center to the ends with a 1.125" wide sanding block. Only experience will tell you how much wood can be removed. I usually taper the sheet from .028" thick on the ends to .022" at the center.

Once the sheet has had the taper sanded into it tape it on a cutting board and true the edge. Mark each end to .050" tall by dragging the sharp edge of a razor blade through a felt-tip marker or ink pad and making a tiny cut at the .050" mark. Repeat the process to mark .030" at the center. Position a straightedge against these marks and make two cuts. You will have a double-tapered spar.

Soak the spars for 30 minutes in cool water. I bend the spars, two at a time, around a parabolic form made from 1/8" balsa. Secure the large ends to the form using tiny rubber bands made by cutting 3/32" wide pieces of a toy balloon. These balloons are

available in bags and are about 1/4" wide and 5" long. Bake the form for 20 minutes at 150 degrees F.

I build and cover on the same smooth, matte-finished painted particle board surface. Assemble the stabilizer over a pencil outline. The building board has 1/6" thick wood sub-ribs under all three ribs. This assures that the ribs will stay at the proper height during covering. Be sure that the covering board has one or two vent holes to allow air under the microfilm to escape. Positioning the two halves of the stab outline over the pencil outline on the building board. Hold the pieces in place with small weights. Tack glue the large ends of the outlines together at the two points where they overlap. Remove the outline from the form, cut scarf joints and glue.

Reposition the complete outline over pencil outline. If the wood does not lay flat on the building board weight the entire perimeter of the wood down to the board with lead weights and brush on water. Allow to dry overnight and check for flatness. Repeat if needed. Soaking the wood helps relieve any warps or stresses.

Cut three ribs from 5.2 LB "A" grain balsa. Make the two outer ribs of .025" thick wood .030" tall. Make the center rib .025" thick and .045" tall. It is important to make the center rib strong. With experience you may be able to reduce the height of the center rib to about .040". Glue all three ribs using Ambroid with no plasticizer. I always "double glue" rib/spar joints by lightly coating both surfaces with tiny amounts of glue, waiting about 10 seconds, and then applying a second coat of glue to one of the surfaces. Hold in position until dry.

The stabilizer should weigh .0028 - .0032 oz. before covering. If it is less I would suspect it won't be stiff enough to work unbraced. If more, it is too heavy.

Covering the stabilizer - Select a sheet of straw or gold microfilm that has been aged at least 60 days. Slacken the film by placing 1/4" wide strips of masking tape about 1/8" inside the perimeter of the film frame. Cut the sheet loose so that it is suspended by the corners. Place small pieces of tape at the mid-points of the long sides to reduce the billow of the film. I generally make the sheet quite slack, since stabilizers are easily warped by taut film.

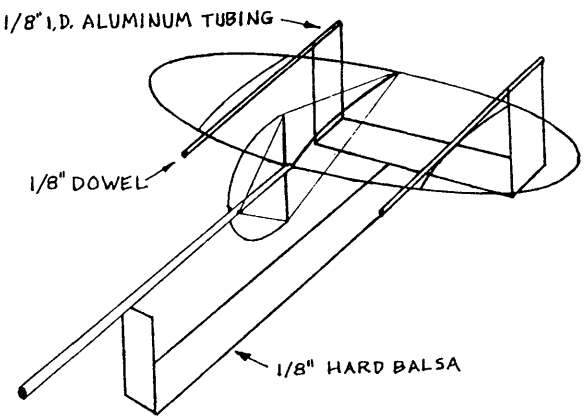
Position the outline on the building board and adhere the balsa to the board with water. Do not get water on the inside of the outline. Using a 3/16 round sable brush adhere the ribs to the balsa sub-ribs with water. This will keep the ribs straight. Make one pass around the outside of the stab leaving a light layer of water on the board outside of the balsa outline.

Lower the film frame over the building board. Blow lightly on the film the be sure that it touches the tops of all the ribs and outline surfaces. Let dry overnight. The outline will shrink as it dries which will add more slack.

Fin construction - Make a circle of .004" boron 4.25" in diameter. Glue the overlapping joint and cut off the excess boron. Cut a 3.75" tall vertical balsa upright from a sheet of stiff .028" 6.0 lb. "A" grain balsa. I usually taper this piece from .055" wide in the center to .040" wide at the ends. Position the boron circle so that the overlapping joint is behind the vertical upright and glue the two points where the circle contacts the tips of the wood. *Let the glue dry well* since considerable stress is transferred through these joints when the boron is broken off. Using smooth-jawed needle-nose pliers or hemostats, gently squeeze the boron/wood joint and break off the unwanted part of the boron circle, leaving a "D" shaped structure.

Cover the fin by outlining a 5" X 5" area of violet or blue slack film with 1/4" tape. Using a #1 sable brush apply water or saliva to *both* sides of the wood and to one side of the boron. Immediately drop the fin onto the film and allow to dry. After 30 minutes or so blow lightly on the film to check for un-attached areas of the boron. If you find any work a tiny amount of moisture under the outer edge of the boron and allow to dry. Cut both the stab and fin loose with a hot wire or battery powered soldering iron.

Assembly - Use a jig to position the stabilizer with the stab tilted at an angle parallel with the angle of the rear wing spar. The boom should be supported so that the correct incidence angle is formed with the stabilizer. Tack glue the stab to the jig. Butt-joint the boom to the stab and then align the large end of the boom with the centerline marked on the jig. Tack glue the large end of the boom to the jig.



Position the fin at the boom/stab juncture and glue the rear joint. Make sure the upright is vertical both from the side and the front by visually comparing it to a square. Cut a piece of balsa .020" X .020" X .750" long and butt glue it to the side of the boom so that it touches the front edge of the boron circle of the fin. Glue the boron to the balsa to provide .125" of rudder offset. Clip off the excess balsa with sharp scissors. Glue a .020" square peg of balsa on the opposite side of the boom near the front of the fin. I brace stabilizers with .0003" tungsten wire from Ray Harlan or Indoor Model Supply. I prefer it to thicker wire because it bends around curves more readily.

Weight one end of the wire with a weight of about .002 oz attached with a 1/16" wide piece of masking tape. Measure about 22" of wire and attach a second weight. Cut the wire behind the second weight and position the wire beginning at the front at the .020" square peg, over the top of the upright, around the back of the stab and under to return to the peg. Examine the wire in a cross-light to look for kinks or areas that are not properly tensioned. The wire should be taut. Glue all points, beginning at the rear of the stab and finishing at the peg on the boom. When dry, cut off the weights. Remove the complete assembly from the jig by softening the glue joint at the front and rotating the dowels gently under the stab spars. Weigh the complete assembly. With a boom length of 13" I look for a weight of about .0075 oz.

Stabilizer incidence can be adjusted in the field by softening the glue joint with acetone and lightly repositioning the stabilizer. I find that I only have to do this once or twice with a new fuselage and the adjustment is generally good until the boom/stick joint is altered, usually following damage.

Please contact me if you have any questions or comments: 297 Hartman Ct., San Dimas, CA 91773-2152. (909) 394-9685.

MEMORANDUM

To: Indoor Contest Board
From: Ray Harlan
Date: November 27, 1995
Subject: Braced Motorstick EZB's

Walt Van Gorder brought to my attention the fact that some people, well established in the Indoor community, have been at least experimenting with EZB's having wood-braced motorsticks. Even a cursory glance at the rules should readily show that this is not allowed. The basis for this comment is that the "motorstick shall be solid and made from a single piece of wood." When we created this wording, it was intended to keep the words simple, yet sufficiently clear that no fooling around with the structure would be tolerated. Even wording describing allowable metal thrust bearings and tissue tubes was avoided in the interest of brevity. However, "solid" meant that not even laminations would be allowed, nor would any other kind of built up structure. Since any bracing is restricted to wood, such wood is necessarily mutually exclusive of the motorstick wood, and therefore is not allowed. There really should not be any substantial debate about this, as it was not intended to allow **any** kind of bracing, except thread or tissue wrap around the thrust bearing and rear hook, and these are not bracing in the normal sense.

Now if Don Lindley were still with us, he probably would disqualify 95% of the EZB's flown in competition today because they have one or two small pieces of wood added to the motorstick. However, they do not contribute to the stiffness of the stick, but rather reduce its buckling strength quite markedly. One piece is the sliver used to increase the prop shaft clearance to the bottom of the stick. With the advent of Tan II and shorter, wider motors, this separation must be increased to prevent knots from bunching and slowing the prop. This feature could be carved from the original piece of motorstick wood, but it is a waste of good wood to do so.

The other piece of wood is a small triangle to hold the rear hook away from the motorstick, again reducing the buckling strength. This piece could be debated on the grounds that it may allow thinner wire to be used for the hook, thereby giving the user a small weight advantage. I don't really care one way or the other, as long as we are consistent in rules interpretation. Perhaps these two pieces of wood should be expicitly allowed through the next rules cycle.

Whether or not the full intent to disallow any form of bracing from EZB motorsticks is clearly presented in the rules, the origins of the event have dictated this simplified structure and over the years we have attempted to refine the rules wording to follow these intentions. It would ruin the event to now allow stick bracing just because the rules do not have the words "stick bracing is not permitted".

Rubber Motor Problems and Solutions

Clever modelers have come up with a variety of solutions for dealing with some of the problems caused by using very long stretch-wound motors for maximum duration. The problems apply, with a few exceptions, to both stick and cabin models.

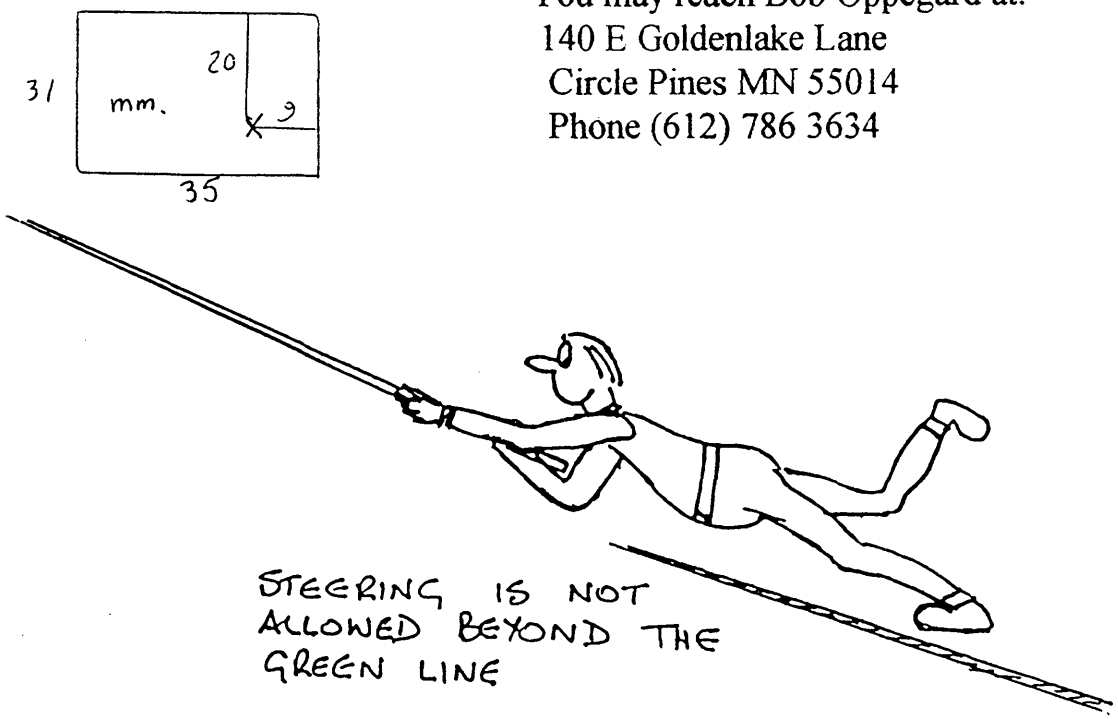
PROBLEMS	SOLUTIONS
1. The rubber bunches up in the back or front of the model after unwinding part way and alters the center of gravity. The plane stalls or dives in.	1. On a stick model, such as a penny plane, use shims under nose bearing and rear hook for extra clearance. On a cabin model use an "S" hook in the prop shaft.
2. The rubber bunches up next to the prop hook and stops the prop intermittently or completely.	2. On a stick model, use a sleeve made of heat-shrink tubing over the rubber next to the prop shaft, or use an "O" ring. Lengthen the prop shaft on a cabin model and use an "S" hook.
3. The rubber "grapevines" while being wound and during the flight the rubber hits the stick or inside of fuselage. The plane flies as if severely underpowered.	3. Discard any motor which grapevines during winding. The motor has been wound too many times, or is improperly lubed.
4. The rubber "climbs" the prop shaft, throws the thrust line off center and causes the prop to wobble.	4. The prop shaft is a loose fit inside the bearing. Change to a tighter bearing.
5. The rubber "spits" out the noseblock toward the end of the flight, causing the model to dive into the floor.	5. Noseblock is loose. Use card stock (not balsa) shims to refit noseblock.
6. The motor peg slides out on one side in a cabin model during the flight.	6. Make a flange on one side of the aluminum tube motor pig. Put doublers on the inside of the rear anchor. Smear Duco in the holes and clean out quickly.
7. A fully wound lubed motor cannot be handled and valuable turns are lost when the motor is attached on a stick model.	7. Use rubber or teflon "O" rings. Rubber 3/16" O.D., 1/8" I.D. "O" rings weigh approximately .070 gram each; teflon "O" rings weigh only .017 each!
8. A fully wound motor breaks inside a cabin model destroying most of the fuselage and the tail feathers.	8. Use a winding tube with a face plate attached. Never wind without it! Or, wind the motor outside the plane and load on a winding stick.
9. You wonder why you are not getting as many turns in your motor as your buddies.	9. Your lube doesn't have any silicone, such as DC-33 or SOAG; your winding technique is inadequate. Read Stan Chilton's article in INAV #85.
10. You're totally fed up with the craziness of rubber motors, but you don't want to give up flying indoors.	10. Try electric. Even if you fly small models, such as Peanut or Pistachio, there are now very small, light motors for these models.

By: Phil Alvirez Feb 8'96

Rubber stripper-a follow-up:

When I went to the 1995 USIC, I brought with me my Oppegard's rubber stripper, and several modelers showed interest in some improvements that I made to it. Later, I showed it to Roy White and talked about publishing this so I sent the info to him. It was published on the January issue, althought the source mentioned was "unknown". Well, I know that I am a newcomer to indoor flying, and not many know me, but it doesn't hurt to show my name, don't you think? Now, seriously, I think that what happened was that the text enclosed with my letter didn't have my name on it. Anyway, here is some additional info that you may find of interest:
For those who may find the plastic holder too complicated, here is a short cut: Make a holding plate from 1/32" to 1/16" rigid material. Any metal, or even formica will do. A clear, stiff plastic could be better, because it shows the rubber-at least for peace of mind. The idea is to hold the rubber on all ways, so it doesn't tend to go out of its way and twist. The dimensions are metric, but you may change to standard. Using a rigid plate you can place the arm on any position- it holds well anyway-so you may even replace it with a washer. It still helps to bend the "pretzel" to tighten the screw.
One more thing: the text on the newsletter reads "baking powder" and should be: "baking soda". Ooops!

You may reach Bob Oppegard at:
140 E Goldenlake Lane
Circle Pines MN 55014
Phone (612) 786 3634



E.-STRIPPING RUBBER

If you reach the stage where you need precisely certain sizes and can't wait to get them through hobby shops or mail order firms, or want to grab certain rubber batch, then you need a rubber stripper. There are two or three manufacturers, all of them good. I use the one made by Bob Oppegard (140 E Golden Lake Ln, Circle Pines MN 55014, phone 612 786 3634). It works great. Follow the manufacturer's instructions to use it. In order to reduce to a minimum the tendency of the rubber to twist and give trapezoidal shapes instead of rectangular, particularly when the rubber is getting narrower, it's convenient to make a pressure plate from .020" to .030" clear plastic, to hold it when entering the cutting blades.
You will need a micrometer, too.

The best results are obtained using the rubber wet, as it slices more uniformly. Wipe off the blades. Cut strips into a practical lenght (10 to 20 ft.) and place in a swallow tray filled with water.

Slide an end into the groove and adjust pressure so it runs with a little drag, but not too much. This is very critical, as too loose will deliver variable width as it wanders around; too tight will do the same, as blades will stretch the rubber and give thinner cuts for a few inches, the the strip will jump and the width will increase. Place a clean cloth over your lap so the strips fall over it. Ideally stripping is done by two persons, but you can make it easier clamping the stripper to the table and feeding the rubber from the table towards you, so you see the strips exiting and watching closely that none sticks to the rollers and gets caught by them or by the blades. Mike the strip as it comes out, every two feet, and put it apart until dry. Using a permanent marker, label a plastic bag with the width and place it next. If you strip more sizes, make enough room for all the pieces with their labeled bags or you'll end re-measuring everything several times.

WINDING

Motors must be broken-in. Always lubricate previously, everytime you wind. This prolongs rubber life and lets you get more turns than any other thing. Two of the most successful ways of winding that differ radically in the technique and the amount of stretch are:
A.-Stretching 4-6 times;
B.-Stretching 9 times.

A.-Stretching 4-6 times:

1.-Wind rapidly about 50% of the turns.
2.-Pause to move the rubber to align knots and let it relax for about two minutes.
3.-Next give a slack and return to the previous position; Continue winding slowly, watching your torque. As torque raises, slack so torque drops.
4.-Pull back and watch: if torque remains, give some slack and continue winding.
5.-Repeat and get closer until reach the desired winds/torque.

B.-Stretching 9 times:

1.-It requires checking tension frequently. While pulling, feel it between your thumb and index and stop when you feel that it is tightening up.
2.-Start winding slowly and begin coming in as you continue winding and check frequently that it doesn't tighten up. Pump up about 25% of turns as you get close to the hook.
3.-Checking the slack, stretch again just short of breaking and start winding again, this time about 15% of the turns. Repeat.
4.-This time do it about 5%, and repeat and repeat until you get the 95% of desired turns.
5.-The last 5% is done in two times. Everytime you end at hook-to-hook distance.
In both techniques, back-off the required turns immediately.

An open letter to Howard Henderson from Ralph Tenny concerning record submissions

Howard:

AMA would like to have this info, if you guys are willing to run it. I have inserted the same thing into the July column (out in June ??).

WHAT IS YOUR OPINION? Please consider this concept and respond:

A very few fliers whose models have exceeded the existing record on several successive flights ON THE SAME DAY submit applications for each flight. Several AMA officials have discussed this and some feel that each flier should be limited to one application per day per event, for these reasons:

1. to reduce paperwork for the HQ staff and for the homologator.
2. the concept degrades the value of records.

Records basically reward advances in the state of the art. Successively longer flights on the same day with the same model often means one of two things:

1. The flier has developed a better power combination that shows the model's true potential.
2. The conditions have continued to improve.

Here is a contest scenario for an event where the national record is 19:38. The data presented is snapshots of the official score sheet at three timed during the day.

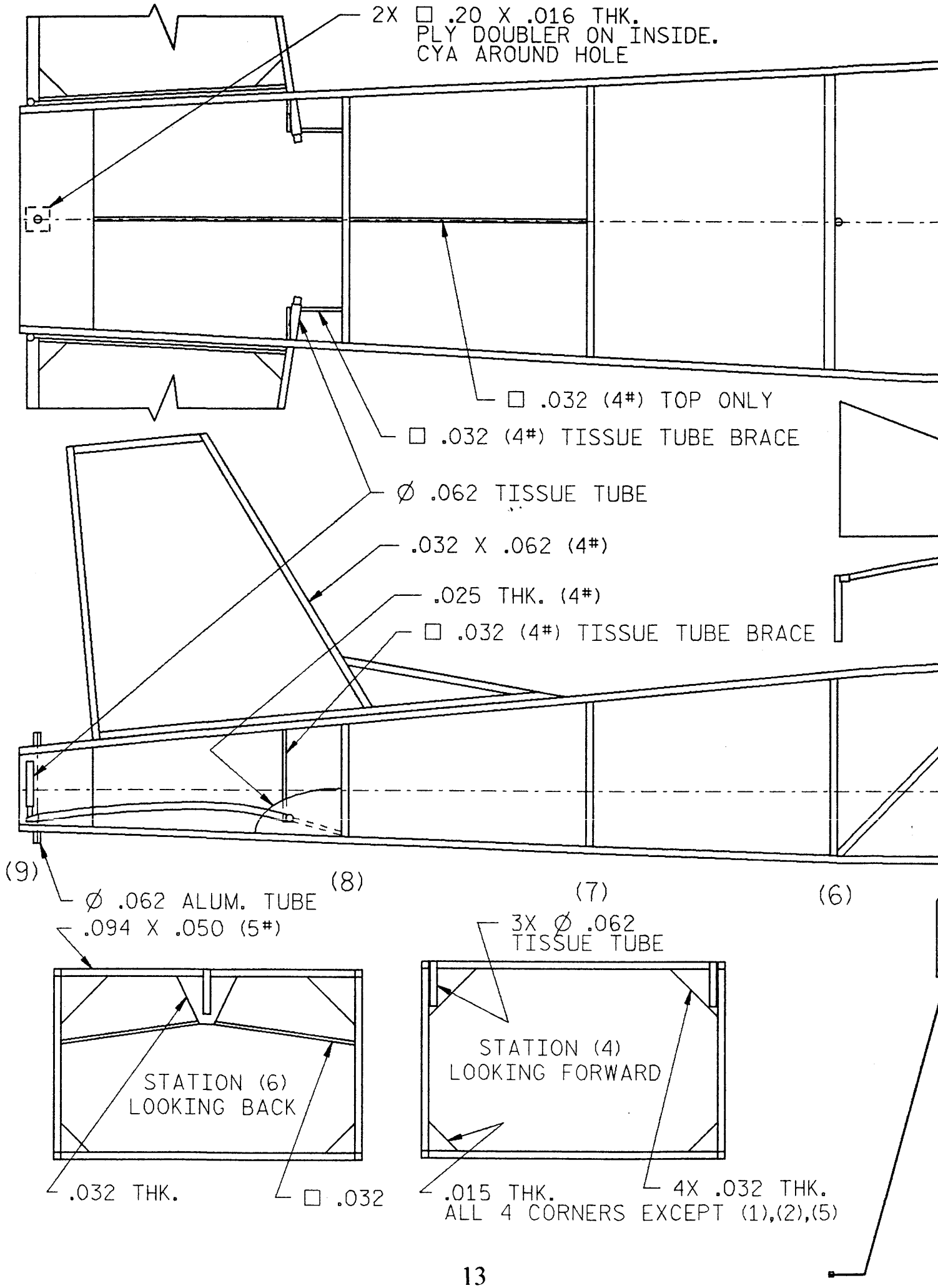
Contestant	10:30 am	1:35 PM	4:30 PM
A	20:38	21:01	22:59
B	21:47	22:07	23:03
C	19:45	22:51	23:10

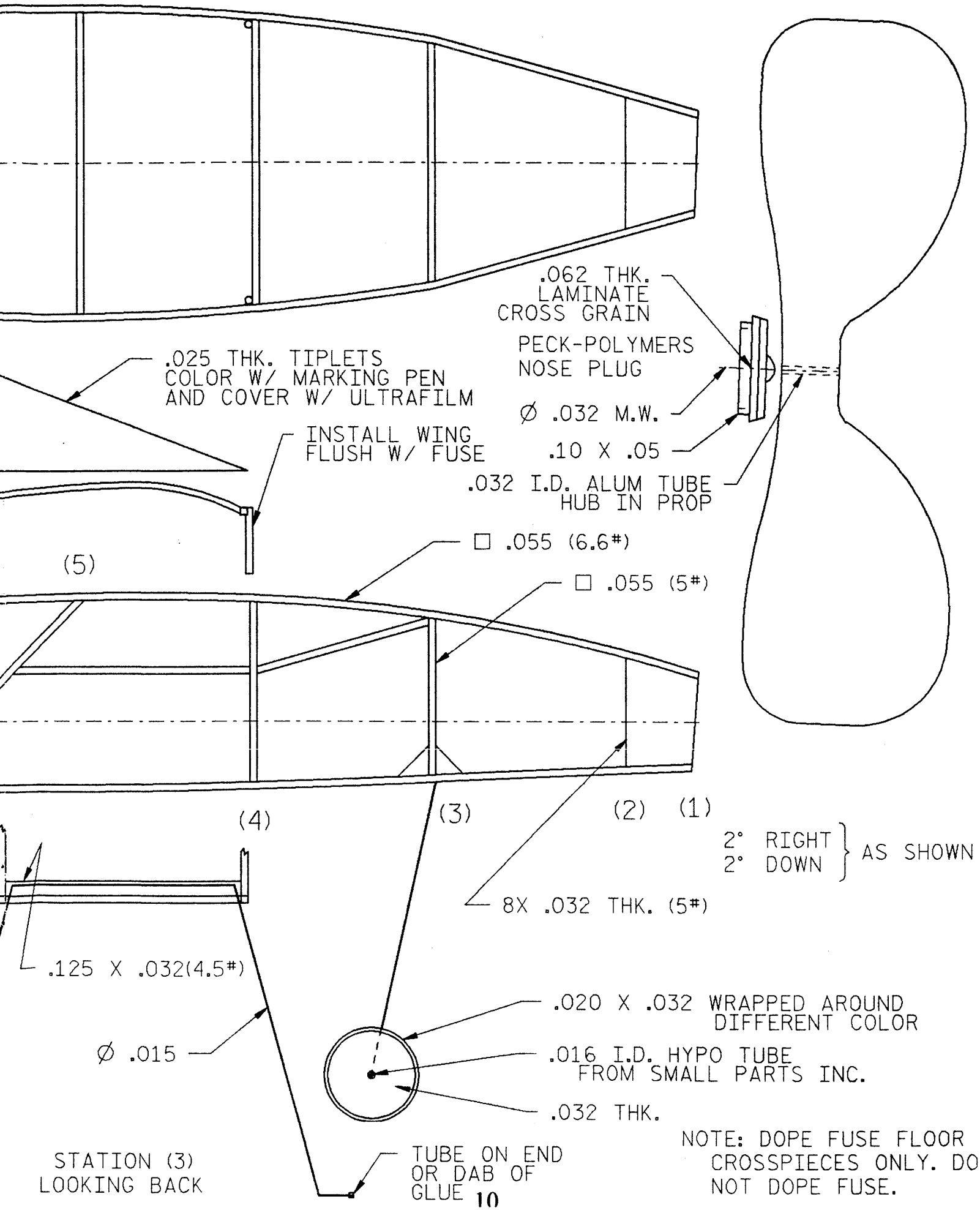
Contestant C wins the contest, with B second and A third. All nine flights broke the record. If the CD did his work properly each flight qualifies for a record, in that no time is actually a record until it is homologated. The issue involved in this : should the AMA HQ be involved in issuing as many as nine records, or only three?

If you have strong feelings on either side of this question, send a postcard to the Academy of Model Aeronautics, 5151 east Memorial Dr. , Muncie IN 47302-9252.

On the postcard (letters are OK) state: one record/day OR unlimited records/day.

Thanks for your help!


2X □ .20 X .016 THK.
PLY DOUBLER ON INSIDE.
CYA AROUND HOLE
□ .032 (4#) TOP ONLY
□ .032 (4#) TISSUE TUBE BRACE
Ø .062 TISSUE TUBE
.032 X .062 (4#)
.025 THK. (4#)
□ .032 (4#) TISSUE TUBE BRACE
(9)
(8)
(7)
(6)
Ø .062 ALUM. TUBE
.094 X .050 (5#)
3X Ø .062
TISSUE TUBE
STATION (6)
LOOKING BACK
STATION (4)
LOOKING FORWARD
.032 THK.
□ .032
.015 THK.
ALL 4 CORNERS EXCEPT (1),(2),(5)
4X .032 THK.


.062 THK.
LAMINATE
CROSS GRAIN
PECK-POLYMERS
NOSE PLUG
Ø .032 M.W.
.10 X .05
.032 I.D. ALUM TUBE
HUB IN PROP
.025 THK. TIPLETS
COLOR W/ MARKING PEN
AND COVER W/ ULTRAFILM
INSTALL WING
FLUSH W/ FUSE
□ .055 (6.6#)
□ .055 (5#)
(5)
(4)
(3)
(2)
(1)
2° RIGHT
2° DOWN
AS SHOWN
8X .032 THK. (5#)
.125 X .032(4.5#)
.020 X .032 WRAPPED AROUND
DIFFERENT COLOR
Ø .015
.016 I.D. HYPO TUBE
FROM SMALL PARTS INC.
.032 THK.
TUBE ON END
OR DAB OF
GLUE
STATION (3)
LOOKING BACK
NOTE: DOPE FUSE FLOOR
CROSSPIECES ONLY. DO
NOT DOPE FUSE.

.60 DIHEDRAL
EACH TIP
TIPLETS GLUED TO OUTSIDE OF RIB, MAKE SURE SPAN IS 16"

□ .
SLI

.070 WIDE X .062 (6#)
TAPER TO .050 AT REAR

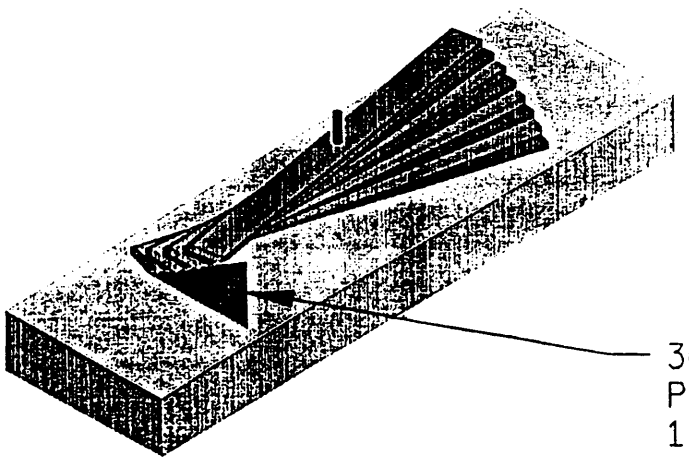
□ .062 (5#)
SLIGHTLY ROUND FRONT

.032 X .062 (4.5#)

(8#) POS

.100 X .062 (4.5#)
TAPER TO .032 AT REAR

.020 THK. (4#)



30° ANGLE AT TIP
PROVIDES
10.86 PITCH

STACK PROP
1/8 X 1/2 X 6.2 (5.5#)
STACKED 8 HIGH
GLUE WITH THINNED
CARPENTERS GLUE.

WING DRY .62
FUSELAGE DRY
STAB DRY .20
RUDDER DRY .
PROP W/ NOSE

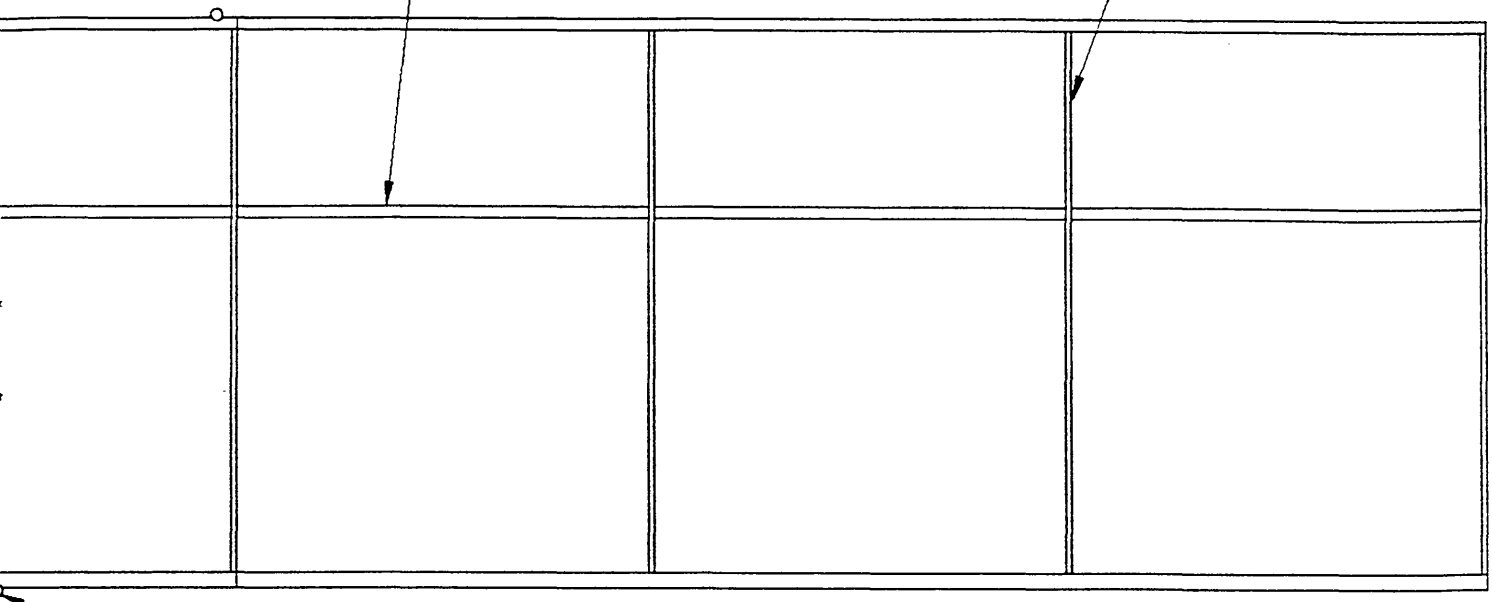
NOTE: BUILD WING FIRST
FUSELAGE PLACE TOP
FRONT PAPER TUBES A

1

062 (7.5#)
GHTLY ROUNDED

□ .062 (6#)
GLUED BETWEEN EACH RIB

.032 X .062 (4.5#)



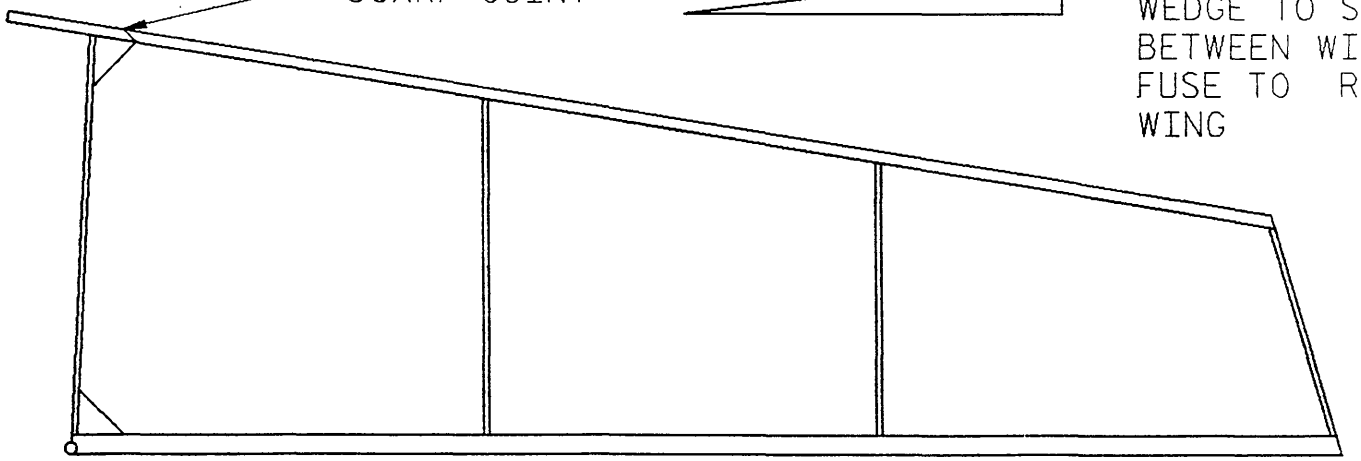
Ø .062 X .50 (8#)
WING POSTS ARE
SLIGHTLY RECESSED
IN SPAR

TS

.032 WASH-IN ON RIGHT WING PANEL
MODEL FLIES TO RIGHT

SCARF JOINT

.062 THK. (10#)
WEDGE TO SLIDE
BETWEEN WING &
FUSE TO REMOVE
WING



WEIGHTS

GRAM
1.0 GRAM-COVERED W/ GEAR 2.3 GRAM
GRAM
045 GRAM- COVERED .15 GRAM
E BLOCK 1.85 GRAM

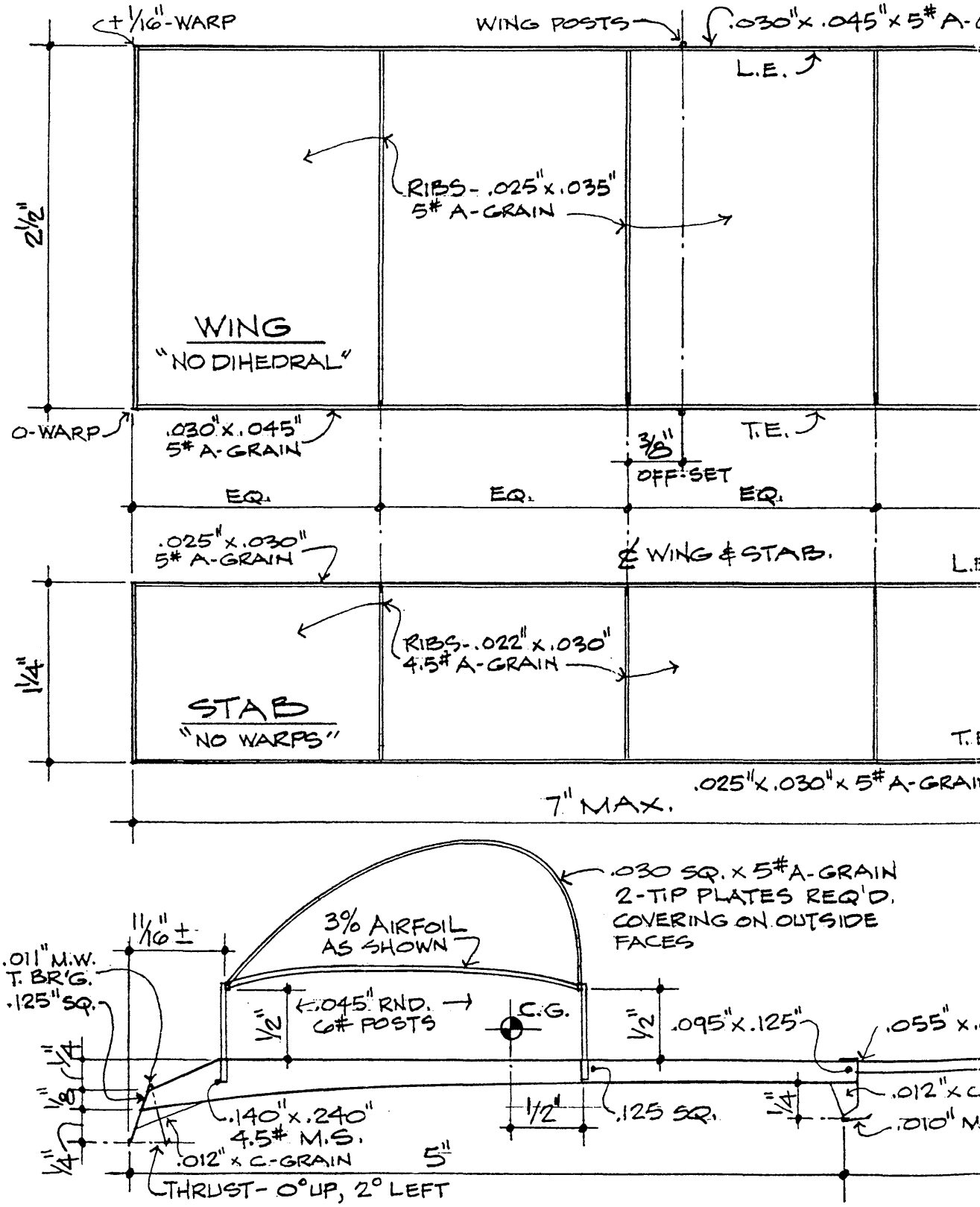
, COVER AND PLACE POSTS. WHEN BUILDING
CROSS BRACE (6) LAST. MOUNT WING IN
ND THEN MOUNT REAR WING TUBE ASSEMBLY.

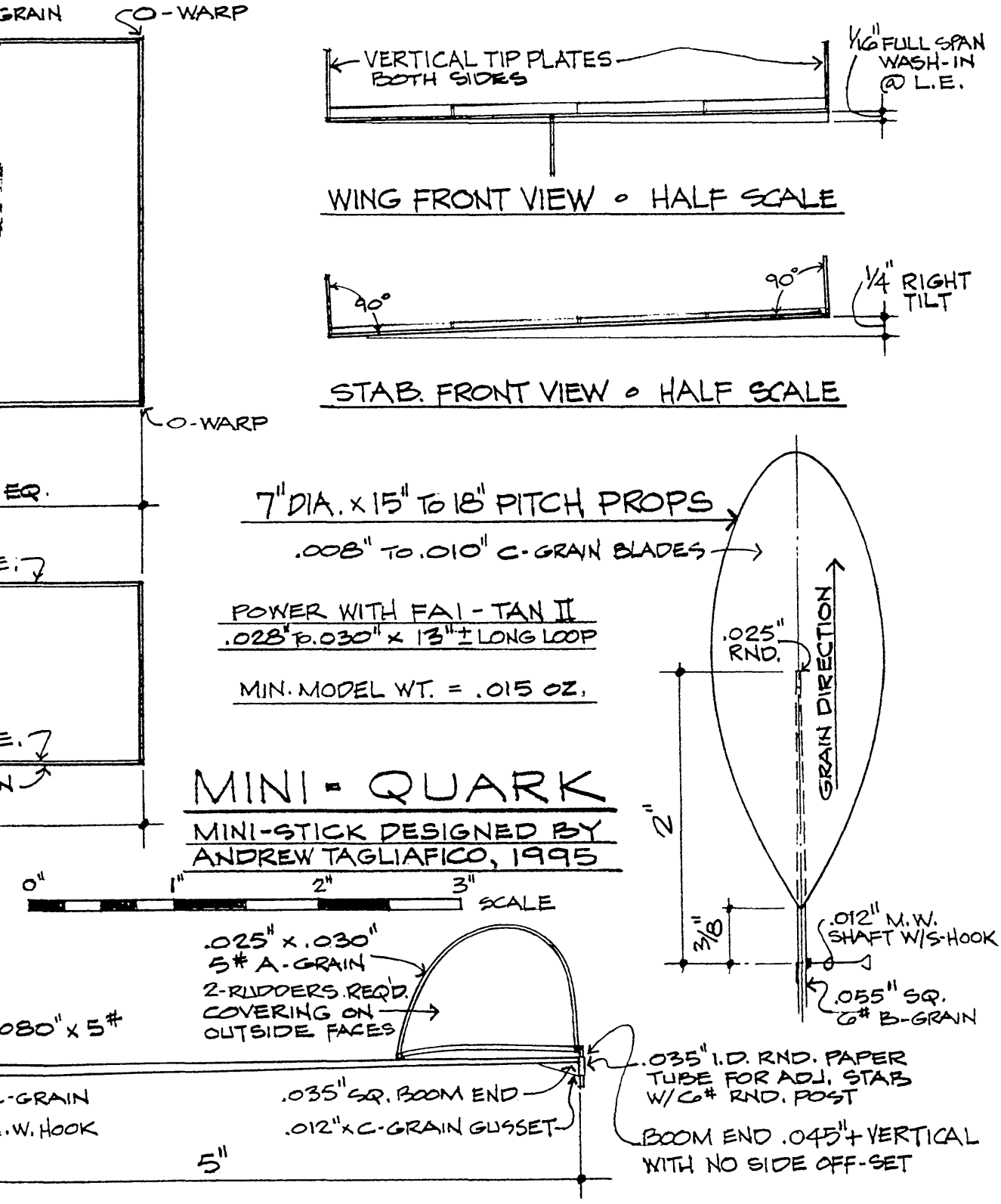
2 3 4 5 6

BEST FLIGHT 5:32 @ '94 U.S.I.C.
RUBBER .075 X 38" LOOP TAN II
5000 TURNS

BOSTONIAN
"PATRIOT"

DESIGNED BY: L.COSLICK
DRAWN BY: M.PALRANG


±1/16"-WARP
WING POSTS
.030"x.045"x5# A-
L.E.
RIBS-.025"x.035"
5# A-GRAIN
2½"
WING
"NO DIHEDRAL"
0-WARP
.030"x.045"
5# A-GRAIN
3/8"
OFF-SET
T.E.
EQ.
EQ.
EQ.
.025"x.030"
5# A-GRAIN
℄ WING & STAB.
RIBS-.022"x.030"
4.5# A-GRAIN
1¼"
STAB
"NO WARPS"
.025"x.030"x5# A-GRAIN
7" MAX.
.030 SQ. x 5# A-GRAIN
2-TIP PLATES REQ'D.
COVERING ON OUTSIDE
FACES
11/16"±
3% AIRFOIL
AS SHOWN
.011" M.W.
T. BR'G.
.125" SQ.
.045" RND.
6# POSTS
C.G.
½"
½"
.095"x.125"
.055"x
1/4"
1/8"
1/4"
.140"x.240"
4.5# M.S.
.012" x C-GRAIN
1/2"
.125 SQ.
.012"x
.010"
5"
THRUST- 0° UP, 2° LEFT


GRAIN
O-WARP
VERTICAL TIP PLATES BOTH SIDES
1/16" FULL SPAN WASH-IN @ L.E.
WING FRONT VIEW • HALF SCALE
90°
90°
1/4" RIGHT TILT
STAB. FRONT VIEW • HALF SCALE
O-WARP
EQ.
7" DIA. x 15" TO 18" PITCH PROPS
.008" TO .010" C-GRAIN BLADES
POWER WITH FAI-TAN II
.028" TO .030" x 13" ± LONG LOOP
MIN. MODEL WT. = .015 OZ.
MINI-QUARK
MINI-STICK DESIGNED BY ANDREW TAGLIAFICO, 1995
0" 1" 2" 3" SCALE
.025" RND.
GRAIN DIRECTION
2"
3/8"
.012" M.W. SHAFT W/S-HOOK
.055" SQ. 6# B-GRAIN
.025" x .030" 5# A-GRAIN
2-RUDDERS REQ'D. COVERING ON OUTSIDE FACES
.080" x 5#
.035" I.D. RND. PAPER TUBE FOR ADJ. STAB W/ 6# RND. POST
.035" SQ. BOOM END
.012" x C-GRAIN GUSSET
BOOM END .045" + VERTICAL WITH NO SIDE OFF-SET
-GRAIN
.W. HOOK
5"

Mini- Stick Postal results

Name	Country	Time	Ceiling Ht- ft	rection fac	Corrected time	Place
Vangorder,Walt	USA	538	17.916	1.733	932.598	1st Overall
Clem ,Jim	USA	558	23	1.618	902.628	1st USA
Toru, Yatabe	JAPAN	563	29.52	1.504	846.670	1st International
Vancil,Mark	USA	424	10.5	1.984	841.139	2nd USA
Platt ,Bob	USA	398	8.166	2.101	836.138	3rd USA
Toru, Onishi	JAPAN	547	29.52	1.504	822.608	2nd International
Mzik, Larry	USA	473	20	1.682	795.698	
Frugoli,Gene-Francis	FRANCE	378	8.22	2.098	792.969	3rd International
Yatabe, Toru	JAPAN	508	29.52	1.504	763.958	
Collins, Walt	USA	359	8.166	2.101	754.205	
Sova, Tom	USA	441	20	1.682	741.866	
Shigezoshi, Nonaka	JAPAN	470	25.94	1.562	734.367	
Hoffman, Earl	USA	424	18.95	1.707	723.898	
Kazumasa, Kihara	JAPAN	473	29.52	1.504	711.323	
Sabiscak Tony	USA	353	10.5	1.984	700.288	
Shigezashi, Nonaki	JAPAN	439	25.94	1.562	685.930	
Sauderlsen, Pete	USA	401	18.95	1.707	684.629	
Cagan, John	USA	395	18	1.731	683.852	
Richards,Derek	USA	400	18.958	1.707	682.844	
O'Donnell, John	USA	400	18.958	1.707	682.844	
Person< Lee	USA	322	8.166	2.101	676.474	
Jintarow, Nakao	JAPAN	432	25.94	1.562	674.993	
Thuthu, H	JAPAN	428	25.94	1.562	668.743	
Wilson, Roy	ENGLAND	438	28.07	1.527	668.656	
Yoshihiko, Arai	JAPAN	423	25.94	1.562	660.931	
Shinsuke, Miura	JAPAN	435	29.52	1.504	654.177	
Hirotdvaka,Inove	JAPAN	418	25.94	1.562	653.118	
Hidahararu, Thutenu	JAPAN	416	25.94	1.562	649.993	
? ?	JAPAN	429	29.52	1.504	645.154	
Kaneko, Shoji	JAPAN	428	29.52	1.504	643.650	
Minorue, Jida	JAPAN	427	29.52	1.504	642.146	
Yates, Dave	USA	374	18.958	1.707	638.459	
Crosby, Don	USA	476	43	1.338	636.844	
Grant, Jim	USA	365	18	1.731	631.914	
Tadashi, Abe	JAPAN	420	29.52	1.504	631.619	
Kurihara, Hiroshi	JAPAN	402	25.94	1.562	628.119	
Akio, Akahoshi	JAPAN	397	25.94	1.562	620.306	
Alverez, Phil	CANADA	478	48.3	1.288	615.803	
Slusarczyk, Chuck	USA	475	48.3	1.288	611.938	
Sadao, Soneya	JAPAN	391	25.94	1.562	610.931	
Atzio, Atzakoshi	JAPAN	391	25.94	1.562	610.931	
Nakao, Jintarou	JAPAN	387	25.94	1.562	604.681	
Goro, Ueno	JAPAN	386	25.94	1.562	603.119	
Roch Edmond	FRANCE	354	19.52	1.694	599.506	
Tomita, Sadayoshi	JAPAN	353	19.84	1.686	595.146	
Tellier, Fred	USA	458	48.3	1.288	590.037	
O'Grady. Dan	CANADA	483	59	1.205	582.014	
Hiroshi, Anno	JAPAN	385	29.52	1.504	578.984	

Mini- Stick Postal results

Tsunekaru, Thujz	JAPAN	383	29.52	1.504	575.976
Yuiehi, Kateoh	JAPAN	367	25.94	1.562	573.432
Ross, Lincoln	USA	300	12.8	1.891	567.293
Kazumasa, Komura	JAPAN	377	29.52	1.504	566.953
Sadayoshi, Tomita	JAPAN	363	29.52	1.504	545.899
Fukuda, Minoyu	JAPAN	348	25.94	1.562	543.744
Weckerly, Stu	USA	416	48.3	1.288	535.929
Tornkvist, George	SWEDEN	250	7.8	2.122	530.509
Olshefsky. Peter	CANADA	439	59	1.205	528.994
Kiyoshi, Sikimizu	JAPAN	338	25.94	1.562	528.120
Seizou, Tamia	JAPAN	349	29.52	1.504	524.845
Akira,Someya	JAPAN	332	25.94	1.562	518.745
Hashimoto, Kenjiro	JAPAN	339	29.52	1.504	509.807
Hirashi, Kurihara	JAPAN	320	25.94	1.562	499.995
Brocks, Peter	USA	236	8.166	2.101	495.801
Ikeda, Yoichi	JAPAN	327	29.52	1.504	491.760
Komura, Kazumasa	JAPAN	324	29.52	1.504	487.249
Steeb,Don	CANADA	403	59	1.205	485.614
Tokeshi, Myozorown	JAPAN	307	25.94	1.562	479.683
Harolaka, Inone	JAPAN	304	25.94	1.562	474.995
Long, Don	CANADA	363	48.3	1.288	467.649
yoichi, Ikeda	JAPAN	303	29.52	1.504	455.668
Tamia, Seizo	JAPAN	298	29.52	1.504	448.149
Campbell, Dave	USA	225	10.5	1.984	446.359
Grange, Yannick	France	256	19.52	1.694	433.541
Tabellini, Renzo	ITALY	279	26.9	1.546	431.316
Sullivan, Ed	USA	204	8.166	2.101	428.573
Pontan, Sven	SWEDEN	263	23.8	1.602	421.298
Dimes, George V.	ENGLAND	246	19.3	1.699	417.902
Orr, Don	USA	195	8.166	2.101	409.666
Chambers, T	USA	253	24.6	1.587	401.442
De Angelo, Giacomo	ITALY	259	26.9	1.546	400.397
VanDover,Abram	USA	186	8.166	2.101	390.758
Slusarczyk,Chuck	USA	321	59	1.205	386.804
Rosenberg, David	USA	279	59	1.205	336.195
Hartstein,Daniel	SWEDEN	181	19.84	1.686	305.160
Barber, Jack	USA	253	59	1.205	304.865
Pianigiani, Franco	ITALY	155	26.9	1.546	239.620
Font-Bellot, Luis	SPAIN	127	13.3	1.873	237.870
Rodriguez, Santiago	SPAIN	134	16.4	1.775	237.819
Ogden, Ron	USA	178	59	1.205	214.490
Hacker, Vern	USA	162	59	1.205	195.210
Ms. De Robertis, Stefania	ITALY	116	26.9	1.546	179.328
Bender, Robert	USA	126	36.54	1.409	177.508
Spagnoli, Maurio	ITALY	102	26.9	1.546	157.685
Haro-Martinez, Fernando	SPAIN	81	13.3	1.873	151.713
Fagnotti, Maurizio	ITALY	97	26.9	1.546	149.956

AMA RECORDS UPDATE
OPEN CLASS

Catapult Glider Unlimited Class

CAT I	2/18/96	1:12.3	Roy White
CAT II	2/18/96	1:29.4	Robert Roman

Catapult Glider Standard Class

CAT I	2/11/96	1:03.4	Roy White
CAT I	2/18/96	1:12.3	Roy White
CAT III	3/96	1:32.7	Wes Anderson

Mini-Stick

CAT I	1/13/96	9:18	Jim Clem
CAT II	1/1/96	4.38	Don Crosby
CAT II	1/7/96	9:11	Edward Berray
CAT III	1/1/96	6:43	Don Steeb
CAT III	3/10/96	10:18	Walter Vangorder
CAT IV	1/28/96	6:29	Gary Underwood
CAT IV	1/28/96	7:15	Karl Van Buran
CAT IV	1/28/96	9:08	Robert Eberle

AMA Stick

CAT I	1/22/96	39:19	Bob Randolph

EZB

CAT I	2/11/96	21:44	Larry Coslick

ROG Stick

CAT I	2/11/96	14:08	Larry Coslick
CAT II	4/11/96	14:32	Larry Coslick *

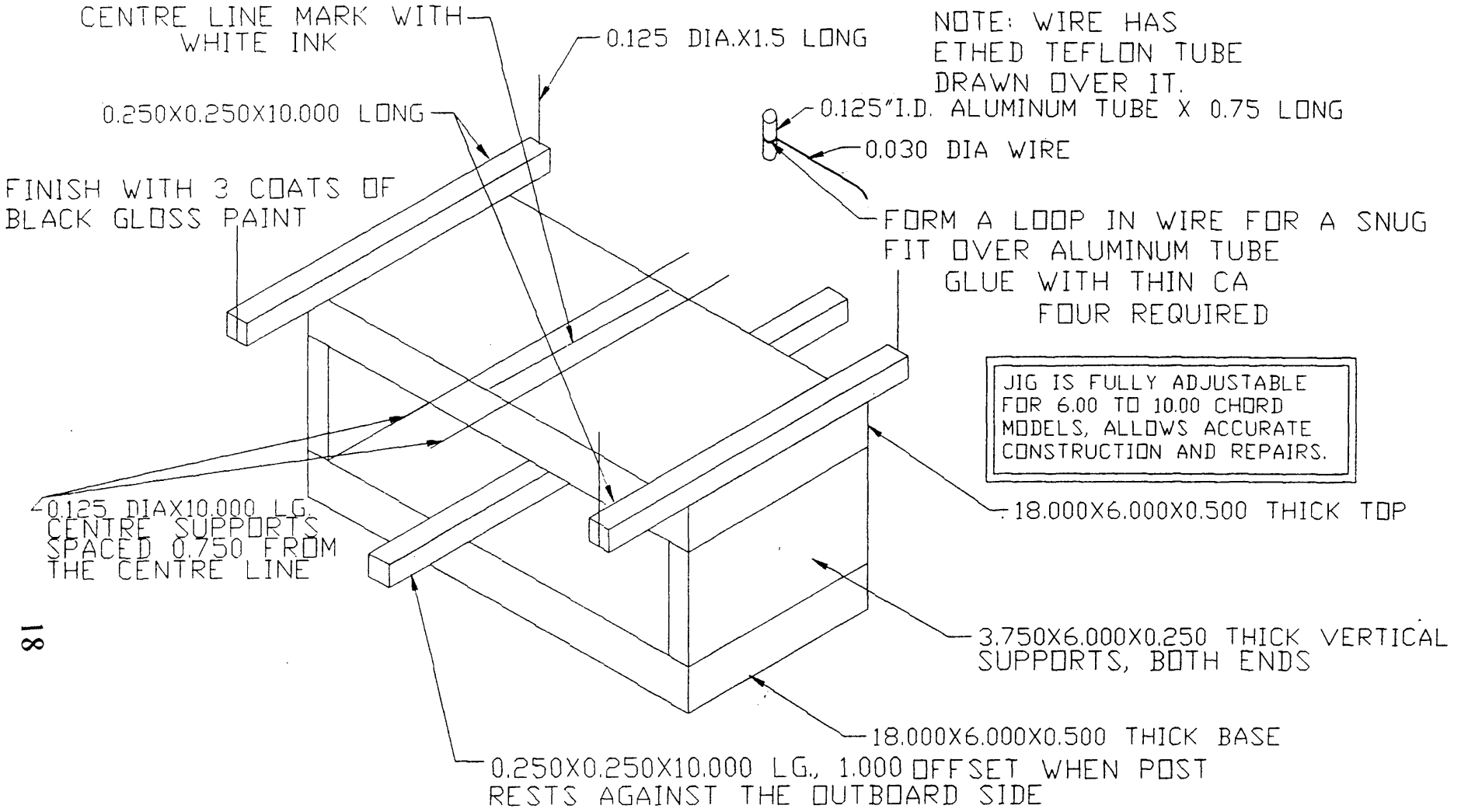
Pending *

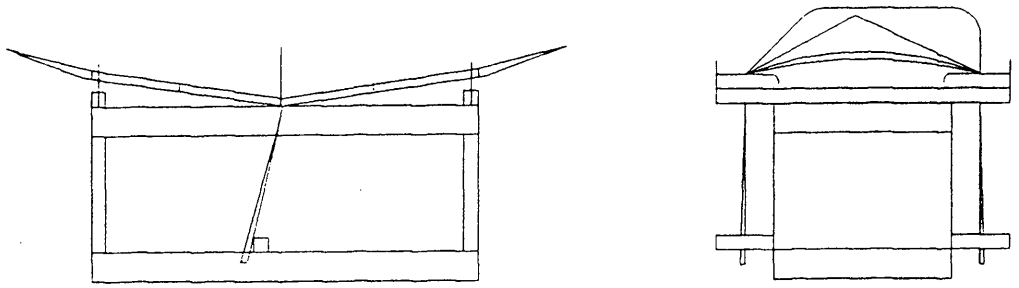
F.A.I. MODEL SUPPLY

I.N.A.V. has recently talked to the new owner of F.A.I. Model Supply, John Capp. John has flown both indoor and outdoor rubber and understands and is interested in our needs. He will supply the same great quality rubber and in the same sizes as before.

Several modelers have suggested to John that they set up an escrow account with him and he would send them one pound of rubber each time a new batch comes in. In some areas of the country, indoor news travels slow and this way we would be assured of having the best rubber available. We at I.N.A.V. endorse this policy and hope that John adopts it.

John said that he plans on attending the Indoor Championships at Johnson City this spring.

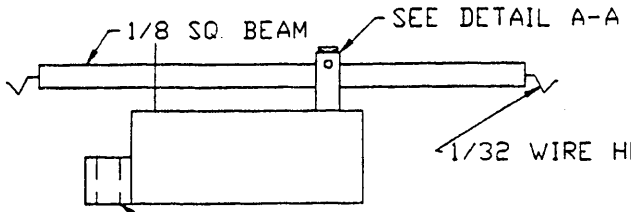


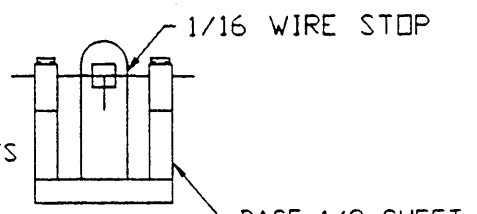


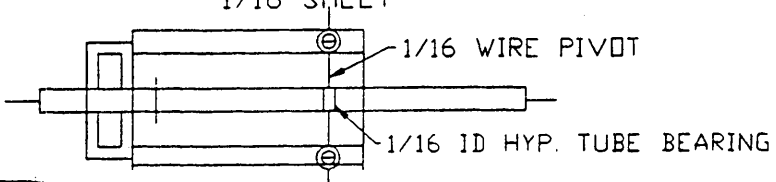
ASSEMBLY/WING MOUNTING DETAIL

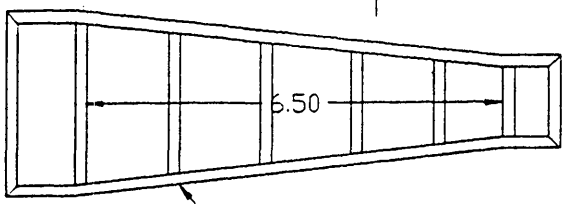
F1D WING BRACING JIG

DESIGNED AND DRAWN BY:
VLADIMIR N. LINARDIC

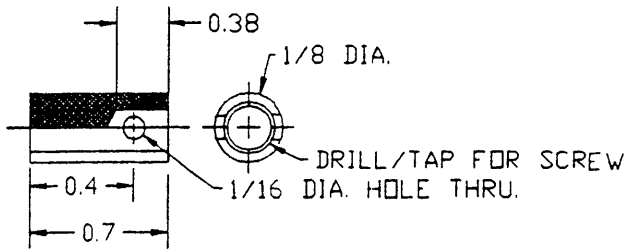






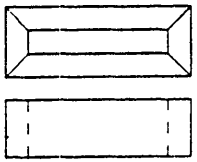


STAND



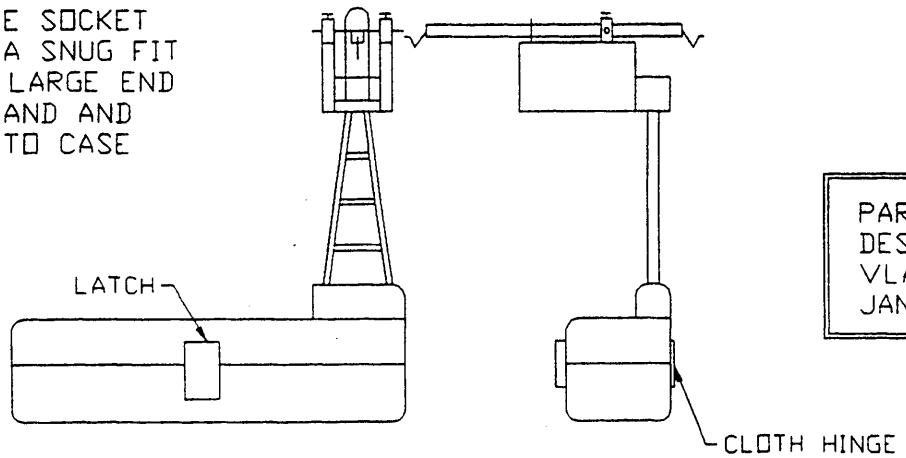
MATL.-BRASS
SIDE SHOWN IN 1/2 SECTION

DETAIL A-A



FEMALE SOCKET
MAKE A SNUG FIT
OVER LARGE END
OF STAND AND
GLUE TO CASE

NOTE: MAKE 3 BEAMS WITH RATIOS OF 5-1, 4-1 AND 1-1.
THIS ALLOWS THE USE OF 1/5, 1/4 AND 1/2 MOTORS.
SCALE HAS 3/16 THK. BALSA TRANSPORT CASE
MEASURING 1.5 X 1.15 X 7.5 LONG, WHICH ALSO SERVES
AS A BASE WHEN SCALE IS ASSEMBLED.



FINAL ASSEMBLY

PARTIAL MOTOR BALANCER
DESIGNED AND DRAWN BY:
VLADIMIR LINARDIC, CANADA
JAN 12,1996

1996 Indoor Free Flight National Championships

East Tennessee State University, Memorial Center Arena Johnson City, TN

May 29 - June 2, 1996

AMA HQ USE
Type _____
Amount _____
Date _____
Entered by _____

AMA SINCE 1936

Contestant Information: (Separate Mechanic form)

1. ☐ JR ☐ SR ☐ OP
2. DOB _____ 3. AMA # _____
4. Name _____
5. Address _____

City _____ State ____ Zip _____

6. Day Phone (____) _____

Fees are a result of AMA and SIG negotiation. Entry forms postmarked after April 15, 1996 must include late registration fee of $25. Requests for refunds must be in writing and postmarked by April 15, 1996. **ABSOLUTELY NO REFUNDS AFTER APRIL 15, 1996.**

FEES:

Event fees: $ _____

Late fee if applicable: $ _____

Total Enclosed $ _____

☐ Check ☐ VISA ☐ MasterCard Exp. date __/__

Card # ____-____-____-____

Event/Schedule

Wednesday, May 29
Practice Day

Thursday, May 30
- ☐ 201 *HL Stick
- ☐ 202 Intermediate Stick
- ☐ 203 *F1D
- ☐ 204 Cabin ROG
- ☐ 209 Helicopter
- ☐ 210 Ornithopter
- ☐ 211 Autogiro
- ☐ 212 HL Glider
- ☐ 214 ROG Stick
- ☐ 218 Standard Cat. Glider (JS) (O)
- ☐ 219 Unlimited Cat. Glider (JS) (O)

Friday, May 31
- ☐ 205 Manhattan
- ☐ 207 Pennyplane
- ☐ 215 Bostonian

Saturday, June 1
- ☐ 208 Limited Pennyplane
- ☐ 505 Peanut Scale

(201, 203 finish flying)

Sunday, June 2
- ☐ 206 Easy B
- ☐ 213 Kit Plan Scale
- ☐ 220 Ministick
- ☐ 507 Flying Rubber Scale

**Events will finish flying on Saturday, June 1*

Fees:
Open: $25 first event, $10 each additional
Jr/Sr: $10 flat fee (any number of events)

FOR ANY AND ALL EVENTS: I hereby certify that I have read all information accompanying this entry form, and that models entered by me will be built by me (if required) and flown in compliance with the current Competition Regulations or FAI Sporting Code if it applies, and will previously have been successfully flight tested and proved to be airworthy in accordance with the Official AMA Safety Code.

_____ _____
(Applicant's Signature) (AMA Number)

IN CASE OF EMERGENCY PLEASE CONTACT:

NAME _____ Day Phone _____ Relationship _____

Address _____

City, State, Zip _____

APPLICANT CHECK LIST:

- ☐ Double check and verify correct fees are enclosed
- ☐ Check(s) signed and payable to AMA
- ☐ Name, AMA number, and complete address shown
- ☐ Emergency contact information (above)
- ☐ Have read all schedule and processing information
- ☐ All credit card information is given (expiration date, card number, card company)
- ☐ All events are indicated
- ☐ No conflict exists in "one only" events, if applicable
- ☐ Team entry is in compliance with AMA rule book, if applicable
- ☐ Frequency information, if applicable, is complete and correct
- ☐ Signature above

Send registration form to AMA Headquarters, 5151 E. Memorial Dr., Muncie, IN 47302. Attn: Competitions Dept.
Contestant: Keep bottom copy. Return others to AMA Headquarters.

1996 AMA INDOOR NATIONALS AND THE FIFTEENTH UNITED STATES INDOOR CHAMPIONSHIPS "MINI-DOME"-EAST TENNESSEE STATE UNIVERSTY JOHNSON CITY, TENNESSEE MAY 29 THRU JUNE 2

Send Entry Payable To:
USIC 96, 5432 Haft Rd Cincinnati, OH 45247

NON AMA EVENTS REGISTRATION

NAME_____AMA #_____

STREET_____ JR [ ] SR [ ] OPEN [ ]

CITY_____STATE_____ZIP#_____

PHONE #_____

I hereby certify that I understand all of the rules under which I will compete and will diligently follow the Offical AMA Safety Code as well as any rules that may be established on site and will apply the use of accepted common sense in all my flying and affairs at the contest site.

SIGNATURE_____

FEES
Basic entry fee includes one event.

Entry fee	$10.00	_____
Junior and Senior entry	$1.00	_____
Additional events, OPEN	$5.00	_____
Additional events Jr & Sr	$1.00	_____
Banquet (Per Person)	$21.00	_____
8' Table & 2 Chairs	$14.50	_____
Dormitory cost (See below)		_____
Total Fees	$	_____

DORMITORY COST AT ETSU RESERVATION

Single occupancy----------$26.50 per night

Double occupancy----------$26.50 per night

Triple occupancy----------$41.25 per night

NON-AMA EVENTS

[X] Events entered

[ ] Pro 20
[ ] 35 CM
[ ] FROG
[ ] No Cal
[ ] Golden Age Scale
[ ] Pistachio
[ ] High Wing Mono
[ ] FAC Scale
[ ] Unlim Rbr Speed.
[ ] Coconut Scale
[ ] Mass Launch P-24

MUST BE POSTMARKED BY MAY 23 1996
LATE ENTRY FEE OF $10.00 PAYABLE ON SITE

*Please Indicate Reservation In:

	MAY 28	MAY 29	MAY 30	MAY 31	JUN 1	JUN 2	No. of Rooms
Single Occ.							
Double Occ.							
Triple Occ.							

Name of room mates if known:

_____

No linen will be provided, so bring your own sheets,pillow cases,towels, etc. For double and triple occupancy rooms, you must recruit your own room mate or mates. Some rooms are with baths and others have adjoining baths,(shared). NOTE: A $25.00 fee will be charged for lost or unreturned keys. NO EXCEPTIONS.

REBATES WILL BE MADE AS APPROPRIATE ON ROOMS

DORMITORY HOUSING WILLBE IN CARTER HALL

MAKE CHECKS PAYABLE TO USIC 96

Banquet to be held on the 31st of May 6:30PM at the Holiday Inn, (Formerly the Sheraton Plaza) Guest Speaker will be Bob Champine.

In Case Of Emergency, Please Contact:

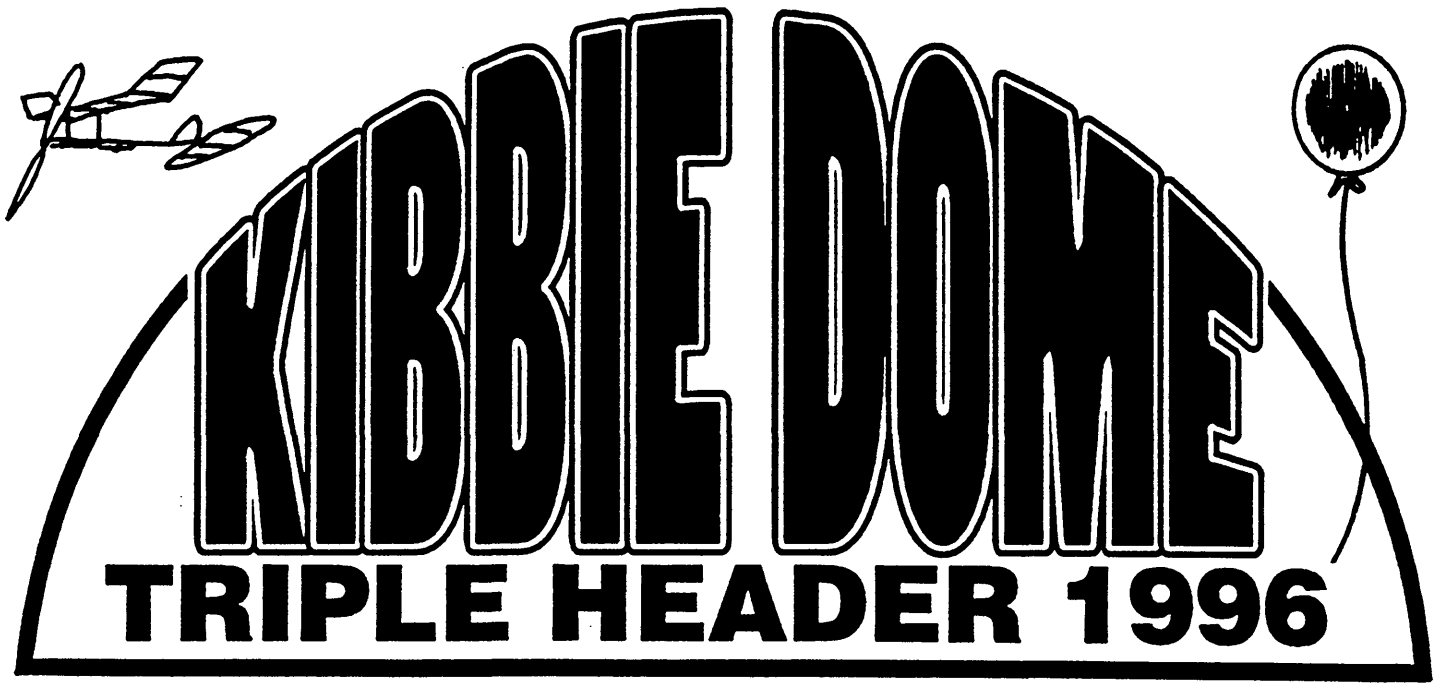
Name _____

Street _____

City_____

State_____ Zip_____ Phone: _____

USIC 96
5432 HAFT ROAD
CINCINNATI, OHIO 45247



ANNUAL-AUG. 1-3 • EASY B INTRNTL.-AUG.4 • INDOOR W.C.-AUG. 5-8

UNIVERSITY OF IDAHO, MOSCOW, IDAHO

MEET 1. (AUGUST 1,2,3) - **Kibbie Dome Annual.** All AMA Official Indoor Events. Six official flights per event (which can be flown all three days - 8:00 A.M. to 8:00 P.M. EXCEPTION : Hand Launch Glider and Catapult Glider flights 8:00 -9:30 A.M. only, daily. SPECIAL EVENTS: Pro-20, Federation R.O.G.,Wingless Autogiro, P-24 & A-6 . ENTRY FEE : Open & Senior- $45.00. Junior Flyers-$25.00. *There are no Event Charges.* CONTEST DIRECTOR : Andrew Tagliafico, Call 503/452-0546 for additional information. Modest Prizes will be given.
SCALE CONTEST DIRECTOR (for A.M.A. Scale and Peanut Scale events) is ED LAMB. Phone 206/747-7806 for information. The static scale judging will take place prior to flying.

Modelers with cars must stop at University Visitor Information Center, 645 W. Pullman Road, (across from Hardee's Rest.) to obtain a visitor's parking permit. Cost is approximately $2.00

MEET 2. (AUGUST 4) - **The 1996 Wally Miller International Easy B Contest.** Six rounds to be flown from 8:00 A.M. to 8:00 P.M. All A.M.A rules governing Easy B models to be observed. Timer volunteers are welcome.
ENTRY FEE: $35.00 for each flyer participating (Junior, Senior and Open combined)
CONTEST DIRECTORS: Wally Miller and Larry Coslick.

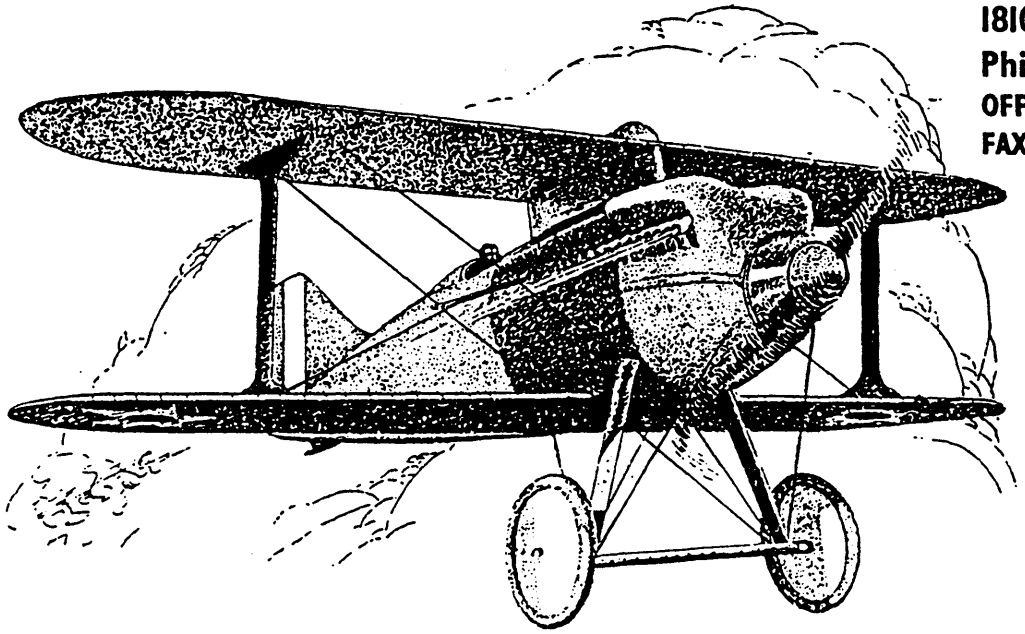
MEET 3. (AUGUST 5-8) - **Indoor F.1.D. World Championships.**
(AUG. 5) Arrival/Set up and Practice. (AUG.6) 7:00 A.M. to 9:00 P.M. Practice & Rnds. 1 & 2. (AUG. 7) 7:00 A.M. to 9:00 P.M. Practice & Rounds 3 & 4. (AUG. 8) 7:00 A.M. to 5:30 P.M.Practice & Rounds 5& 6. (AUG. 8) 7:30 P.M.- Banquet & Awards. World Championships Headquarters at Best Western University Inn, 1516 W. Pullman Road, Moscow, Idaho.
Meet Organizer/Patron: Andrew Tagliafico,10039 S. W. Quail Post Road, Portland OR 97219. 503/452-0546. *NOTE- Timer Volunteers are Needed.*
WORLD CHAMPIONSHIP CONTEST DIRECTOR: Bob Stalick

DOMEDUSTER

Plan Packet 6

A Baker's Dozen Full Size Plans

To:
Stanley Fink
1810 Pine Street
Philadelphia, PA 19103
OFFICE: (215) 732-5014
FAX: (215) 236-9598



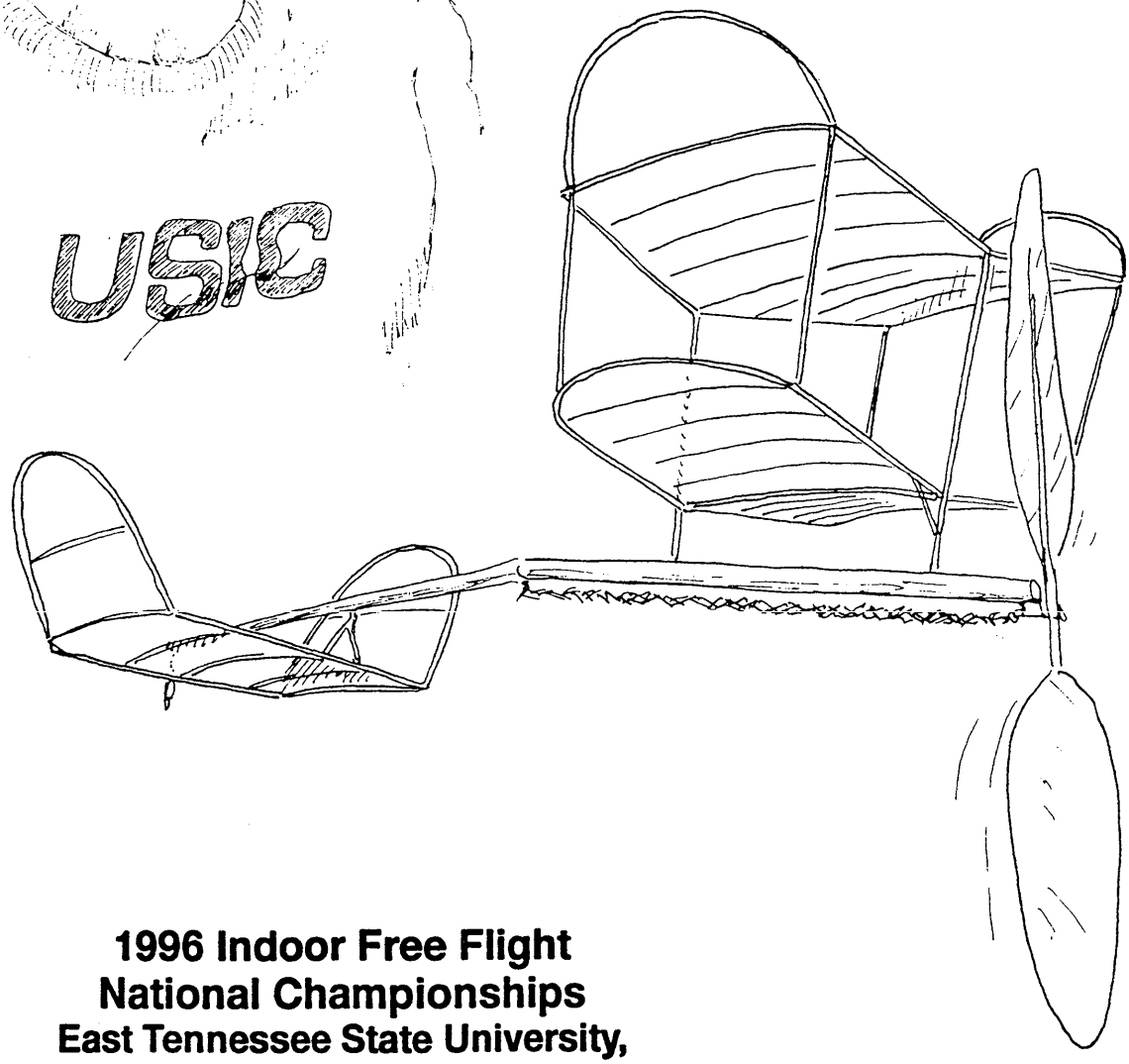
CONTRIBUTORS

Stan Fink	.1930 Prest "Baby Pursuit" Peanut Racer
Stan Fink	.1922 Loening R-4 Pistachio Racer
Stan Fink	.1918 Martinsyde Semi-Quaver Pistachio (B)
Stan Fink	.1923 Wittman "Hardly Ableson" Peanut
Capt. Jake Larson	.1928 Vickers Vigil Peanut (B)
Jerry Wagaman.	.1927 Elias EC-1 Aircoupe Peanut
LeRoi Saterlee	.Sorrell Hyperlight 16" Span Walnut
Rob Hudson	.Anec III WW I Peanut (B)
John Koptonak.	.Beechcraft No-Cal 16" Span
John O'Donnell	.Grand Champion Postal Ministick
Ed Berray	.Catapult Glider Winner
Megow Models.	.Senior R.O.G. 16" Span
Stan Fink	."Savvy Centavo" Ltd. Pennyplane

$12.00 (incl. p/h)

INAV
Indoor News
and Views

ISSUE # 88 JUNE, 1996



1996 Indoor Free Flight National Championships

East Tennessee State University, Memorial Center Arena Johnson City, TN

May 29 - June 2, 1996

RESULTS

INDOOR NEWS AND VIEWS (INAV) IS PRODUCED IN ST LOUIS BY ROY WHITE,
LARRY COSLICK, MARY JANE REILLY HOWARD HENDERSON AND BILL MARTIN.

INAV DUES ARE:
U.S. $9.00/year
Canada $12.00/year
Other (air mail) $15.00/year

4 (min) to 6 issues/year depending on budget and availability of material

The number at the far right of the label indicates when subscription expires.

A few back issues are available: Write for details

Send all dues and correspondence to:
Roy White
(INAV), 1025 Cedar St., Catawissa, MO 63015
****
Howard Henderson (INAV) can be reached via computer E-mail, using the following sign-on:
H PIET H@AOL.COM

USIC contest report

by Steve Gardner

This was my first time at a major indoor contest. It was also my first time in a really good indoor site, and I must say that the flying and the site were magnificent! If you fly under low ceilings most of the year as I do then you must come and try this kind of flying.

The contest was preceded by a day of practice flying so that flyers could get their models working under the 117 foot ceiling. The practice was very important because it proved very difficult to get models to climb to just under the ceiling and no higher. The proper propeller/rubber/ winds took some experimenting to find, and would change a bit in just a couple of hours. The contestants who had practiced under lower ceilings with quarter motors had a much better idea of what was needed, but most everyone found themselves in the steel at one time or another.

Thursday, the 30th was the first day of competition, with the hand launched and catapult gliders leading off. A very good number of competitors kept the air full of gliders, and let me tell you, a good number of these guys knew just where the ceiling was! Zing! and there the glider would be, just a couple feet beneath the very top of the building with the transition over and the glide started. Impressive.

The rubber speed event was fun to watch with models doing two twenty foot diameter circles in around seven seconds! That is about twenty feet per second flight speed, truly blistering for indoor flying.

Once the faster models were done the intermediate sticks, stick ROG, Helicopters, and ornithopters flew. With twenty-six entries the intermediate stick was very popular. Helicopters on the other hand drew only three flyers. In the middle was stick ROG with nine entries.

Ornithopter is one of the more exotic events, and so draws more spectator interest. This became a problem when a news photographer , while trying to get an in flight shot, very badly damaged the very model he was photographing. He then moved on to other models without so much as an apology. We did get a nice write-up in the local paper with photos and the whole bit. Even with our need of good press I think it was a poor trade.

Friday started with FAC scale, Bostonian, Pistachio, and High wing monoplane scale. Each of the scale events drew about a dozen flyers . Bostonian was popular this year with eighteen flyers, which made the mass launch a real treat to watch. Bostonian is becoming a very demanding event with better than five minutes needed to win.

Once Pennyplane started on Friday the air became saturated with models. Twenty or more models in the same air, the mix spiced with a few Manhattan models, the pairs started to fall. Mid-airs were very common and seemed to hit everybody. Most mid-airs with these models result in no damage to the models, unlike the F1Ds and the other lightweights.

Saturday opened with Golden Age, Coconut Scale, No-Cal Scale, Peanut Scale, and F.R.O.G. The No-Cal flyers had a great turn out with twenty-four entries while Coconut scale drew seven flyers. There is an apparent relationship to the time needed to build a given type of model and the number of people flying that type.

Next came the Limited Penny Planes, with the Dime Scale and Legal Eagles flown on the side of the site away from the lighter models. Once again, with so many pennyplanes, there were a good number of mid-airs. None of the heavier, faster models came close to any of the lighter models. There is plenty of room in this site!

Last on Saturday were the lightweights, 35 cm, Pro-20, Hand Launched Stick, and F1D. Seventeen entrees in F1D boiled down to eight flyers. Mid -airs, unexplained motor stick failures, and some just plain old models took a terrible toll amongst these beautiful flyweights. Hand Launch Stick was very popular with fifteen flyers, but these models too suffered a very high attrition rate. 35 cm and the Pro-20 models are not so very delicate and so faired better.

The final day, Sunday , started with Kit Plan Scale, AMA Scale, and the very popular Mini-Stick. The scale events were well supported with ten flyers in Kit and seven in AMA. The AMA models tend to draw a few less flyers because they are very demanding in the level of scale detail. The winning Cessna sported brass water jackets around the scale engine cylinders, full rigging, and operational suspension on the landing gear.

Mini-stick fever! Forty-four flyers filled the air with itsy-bitsy seven inch wonders. Offering a very high fun to building time ratio, these little gems were all over the place. The Mini-Stick mass launch was fun to watch, but the problem of "which one is mine?" became acute. They sure do look alike up there above 100 feet.

The contest finished with EZB being flown from late morning until 4 PM. This event is beginning to be a bit of a specialists event, with half gram models being the norm. Even with the difficulty of building down to half a gram there were still forty-seven flyers in this event. Just as in Mini-Stick there was a bit of a problem keeping up with which model was which. The rules result in very look alike models, most all covered with the same material. Keeping up with one individual model for 25+ minutes in the cloud of flying models was tough for the timers. Accurate timing was important because the race for the top was very close. Twenty-nine seconds separated the top two flyers with the lead changing three times in the early afternoon. A very intense way to close the Championship and the Nationals.

The championships were run very well with good performance from the officials. The sportsmanship and competence shown by the average contestant was of a very high level. There was only one problem with the "average contestant", he was too old! Out of 109 contestants there were only two younger flyers, one junior and one senior! I have trouble believing that our pursuit, as fascinating, satisfying, and affordable as it is , fails to attract the interest of more youngsters! We need to get it in front of them! Take a nephew flying, and spend the time with him, not getting your newest trimmed out.

Next Year. After such a wonderful event we all look forward to next year. We think of the models that we will have ready, the improvements that we need to really get em next time. If you want to be remembered for your performance next year I know a perfect way! You see, we need someone to come forward and agree to run the contest next year. This years heroes , Abram Van Dover, Dave Thompson, Jim Miller, Mary Jane Barber,and all the other wonderful people who ran this contest will be remembered at least as well as any of the winners. Next year it is your turn, OK? Just let us know soon so we all can plan for next year.

1996 USIC HL STICK #201

	PLACE	CONTESTANT	AMA NO.	1	2	3	4	5	BEST FLIGHT	GR. CH. PTS
1	1	MCGILLIVRAY, JACK	F65	28.05	41.06				41.06	
2	2	CHILTON, STAN	L30	12.07	2.35	40.48			40.48	
3	3	COSLICK, LARRY	4652	29.53	29.03	33.56	38.21	40.29	40.29	
4	4	DOIG, RICHARD	5392	28.34	37.46				37.46	
5	5	VALLEE, THOMAS	1126	ATT/.5	34.07	12.05			34.07	
6	6	CLEM, JIM	L55	29.45	33.31				33.31	
7	7	KAGAN, JOHN D.	469254	28.44	31.2	32.44	21.17		32.44	
8	8	HARDCASTLE, R. R.	847	28.45					28.45	
9		BIGGE, WILLIAM R.	L127						DNF	
10		BURKE, EDWARD J.	153313						DNF	
11		GRANT, JAMES B.	159477						DNF	
12		HACKER, VERNON D.	L304						DNF	
13		LANDRUM, BILLIE E.	52674						DNF	
14		LOUCKA, LARRY	1210						DNF	
15		RICHMOND, JAMES W.	4936						DNF	
16										
17										
18										
19										
20										
21										
22										
23										
24										
25										
26										
27										
28										
29										
30										

1996 USIC F1D #203

	PL.	CONTESTANT	AMA NO.	1	2	3	4	5	6	BEST FLT	2ND FLT	TOTAL BEST 2	USA PTS.	GR. CH. PTS
1	1	RICHMOND, JAMES	4936	44:32	33:12	9:02	0.9715	45:43		45:43	44:32	90:15		
2	2	DOIG, RICHARD	5392	31:10	21:32	41:03	39:13	11:55	26:03	41:03	39:13	80:16		
3	3	HULBERT, WILLIAM	1317	11:16	4:51	37:14	38:20	40:20	37:54	40:20	38:20	78:40		
4	4	MCGILLIVRAY, JACK	F65	32:09	40:46					32:09	40:46	72:55		
5	5	LOUCKA, LARRY	1210	29:19	27:48	30:34	25:12			29:19	30:34	59:53		
6	6	CLEM, JIM	L55	26:47	31:53					31:53	26:47	58:40		
7	7	KAGAN, JOHN D.	469254	23:10	23:31					23:10	23:31	46:41		
8	8	GRANT, JAMES B.	159477	29:39						29:39	0:00	29:39		
9		VALLEE, THOMAS	1126							DNF				
10		UNDERWOOD, GARY	1314							DNF				
11		O'GRADY, DAN	F57							DNF				
12		MAREK, DAN H.	2350							DNF				
13		HARDCASTLE, R.	847							DNF				
14		HACKER, VERNON D.	L304							DNF				
15		COSLICK, LARRY	4652							DNF				
16		CHILTON, STAN	L30							DNF				
17		BURKE, EDWARD J.	153313							DNF				
18														

1996 USIC INTERMEDIATE STICK #202

PLACE	CONTESTANT	AMA NO.	1	2	3	4	5	BEST FLIGHT	GR.CH.PTS.
1	CHILTON, STAN	L30	30.26	38.1				38.1	
2	COSLICK, LARRY	4652	33.36	36.05	16.36			36.05	
3	KAGAN, JOHN D.	469254	34.09	30.04	7.2			34.09	
4	THOMAS, MIKE	F66	31.57	31.47	32.49			32.49	
5	GRANT, JAMES B.	159477	31.51	25.02	31.33	9.17	16.28	31.51	
6	BARKER, JOHN	2095	24.41	26.59	28.5	30.32		30.32	
7	LOUCKA, LARRY	1210	29.41	30.3				30.3	
8	SOVA, TOM J.	473169	7.42	23.18	25.29	30.1		30.1	
9	MCGILLIVRAY, JACK	F65	9.27	17.45	28.59			28.59	
10	OLSHEFSKY, PETER	F62	11.57	25.13	25.34	28.39		28.39	
11	VALLEE, THOMAS	1126	27.07	23.52	28.35	8.25		28.35	
12	RICHMOND, JAMES W.	4936	27.18					27.18	
13	HARDCASTLE, R.R.	847	22.41	2.45	25.13	5.47	6.55	25.13	
14	THOMPSON, MICHAEL	1484	19.54	21.4	24.51	24.44		24.51	
15	BELIEFF, DAN	12816	23.46	22.49	19.26			23.46	
16	MARETT, JOHN	F68	20.53	23.2	21.4	23.45		23.45	
17	GANSER, RONALD	7532	22.34	6.1				22.34	
18	MAREK, DAN H.	2350	3.19	5.17	22.09	14.53		22.09	
19	HENDERSON, F.	F70	10.38	21.43	12.01			21.43	
20	KOPTONAK, JOHN D.	58027	12.21	20.36	20.03	16.22	10.39	20.35	
21	O'GRADY, DAN	F57	19.33					19.33	
22	ROMASH, ROBERT	130061	18.58					18.58	
23	RAYMOND JONES, D.	63358	10.46	7.19	8.4	6.12	12.25	12.25	
24	HACKER, VERNON D.	L304	11.15	11.27				11.27	
25	BIGGE, WILLIAM R.	L127						DNF	
26	OBARSKI, R.W.	560						DNF	

1996 USIC CABIN ROG #204

	PLACE	CONTESTANT	AMA NO.	1	2	3	4	5	6	BEST FLIGHT	GR. CH. PTS
1	1	THOMAS, MIKE	F66	22.58	12.22	24.12	24.24			24.24	
2	2	GANSER, RON	7532	22.58						22.58	
3	3	LEONARD, NICK A.	497461	4.35	9.36	11.39				11.39	
4	4	LEONARD, N. JR.	497460	2.28	7.54	5.46				7.54	
5		GRANT, JIM	159477							DNF	
6		LOUCKA, LARRY	1210							DNF	

1996 USIC ORNITHOPTER #210

	PLACE	CONTESTANT	AMA NO.	1	2	3	4	5	BEST FLIGHT	GR. CH. PTS
1	1	WHITE, ROY	6300	14:17	11:00	14:29			14:29	
2	2	COSLICK, LAWRENCE	4652	11:20	12:40	11:22			12:40	
3	3	RIPLEY, ED	484619	5:18	3:16	7:15			7:15	
4	4	PURDY, LEN	129	0:32	0:35	0:28			0:35	
5	5	JOSHU, EUGENE	260643						DNF	
6										

1996 USIC HELICOPTER #209

	PLACE	CONTESTANT	AMA NO.	1	2	3	4	5	BEST FLIGHT	GR. CH. PTS
1	1	VALLEE, THOMAS	1126	9:00	1:10				9:00	
2	2	DIEBOLT, H. J.	97263	5:16	5:35	5:44	5:51	3:41	5:51	
3	3	BIGGE, WILLIAM	L127	2:14					2:14	

1996 USIC AUTOGIRO #211

	PLACE	CONTESTANT	AMA NO.	1	2	3	4	5	BEST FLIGHT	GR. CH. PTS
1	1	GANSER, RONALD	7532	12.46					12.46	
2	2	DIEBOLT, H. J.	97263	3.04	8.15	2.29	4.36		8.15	
3	3	RASH, F.	63458	2.51	0.38	2.31	3.33	3.31	3.33	
4		OLESON, DOUGLAS	480646						DNF	
5		LOUCKA, LARRY	1210						DNF	
6		GANSER, JOHN	179424						DNF	
7										
8										
9										
10										
11										
12										
13										
14										

1996 USIC HL GLIDER #212

	PL.	CONTESTANT	AMA NO.	1	2	3	4	5	6	7	8	9	BEST FLT	2ND FLT	TOTAL BEST 2	GR. CH. PTS
1	1	BOEHM, BERNARD	92567	71.2	75.40	75.8	70.2	75.2	74.5				75.8	75.4	151.2	
2	2	EBERLE, ROB	411592	66	10.10	7.3	59.9	67.8	70.5	14.6	57.7	55.1	70.5	67.8	138.3	
3	3	ROMASH, ROBERT	130061	65.3	66.80	66							66.8	66	132.8	
4	4	THOMPSON, M.C.	1484	55.3	53.70	58.5	55.8	57.2	51.4	10.7			58.5	57.2	115.7	
5	5	KOPTONAK, JOHN	58027	51.5	47.50	52.8	53.8	49.6	50.7	41.5	41.7	50.2	53.8	52.8	106.6	
6	6	SCHLARB, W.L.	14425												0	
7	7	REED, D.A.	19602												DNF	
8	8	BUXTON, JAMES	75154												DNF	

1996 USIC UNLIMITED CAT. GLIDER #219

	PL.	CONTESTANT	AMA NO.	1	2	3	4	5	6	7	8	9	BEST FLT	2ND FLT	TOTAL BEST 2	GR. CHAMP PTS
1	1	WARMAN, ROBERT	18748	60	63.9	83.1	77	51	78	87	76	80.8	87	83.1	170.1	
2	2	THOMPSON, M.	1484	77.3	76.5	83.9	83.6						83.9	83.6	167.5	
3	3	SCHLARB, W.L.	14425	80.1	80.4	78.6	81.7	77.2	78				81.7	80.4	162.1	
4	4	SCHLARB, RALPH	322352	76.4	79.2	79.6	74.5	77.4	72.6				79.6	79.2	158.8	
5	5	FULMER, KEITH	31552	67.4	67.8	74.8	74.5	73.4	77.2	76.2	62.2	69	77.2	76.2	153.4	
6	6	BELIEFF, DAN	12816	68.1	61.6	71.4	49.5	73	70.5	57.3	63.3		73	71.4	144.4	
7	7	PERSON, LEE	383504	46.9	53.9	57.5	52.9	60.3	70.6	63.4	68.5	63.5	70.6	68.5	139.1	
8	8	BOEHM, BERNARD	92567	62.7	59.1	66.8	66.1	64.9	67.7				67.7	66.8	134.5	
9	9	BRIMMER, DONALD	1097	43.5	32.9	36.1	47.6	15.2	12.6	52.1	54.5	47.9	54.5	52.1	106.6	
10	10	WECKERLY, STUART	13250	46	41	48	41.7	45	45.9	49.6	48.1	39.7	49.6	48.1	97.7	
11	11	CAMPBELL, GLENN	15173	46.4	41.9	41.5	35.1	45.1	45.1	46.7	47.9	45.5	47.9	46.7	94.6	
12	12	HARTMAN, PHILLIP	8667	29.6	35.3	9	44.5	32.8	41	44.1	44.8		44.8	44.5	89.3	
13	13	REED, D.A.	19602	41	39	40							41	40	81	
14	14	BUXTON, JAMES	75154												DNF	

	PL.	CONTESTANT	AMA NO.	1	2	3	4	5	6	7	8	9	BEST FLT	2ND FLT	TOTAL BEST 2	GR. CHAMP PTS
15	15	ITALIANO, A.J.	2386												DNF	

1996 USIC STANDARD CAT. GLIDER #218

	PL.	CONTESTANT	AMA NO.	1	2	3	4	5	6	7	8	9	BEST FLT	2ND FLT	TOTAL BEST 2	GR. CHAMP PTS
1	1	THOMPSON, M.	1484	77.2	79.8	82.5	82.5	75	77.2	76			82.5	82.5	165	
2	2	SCHLARB, W.L.	14425	81	80.6	77.2	81.3	77.6	79.4				81.3	81	162.3	
3	3	SCHLARB, RALPH	322352	77.2	79.4	79.8	74	72	78	79.8	77.4	76.2	79.8	79.8	159.6	
4	4	FULMER, KEITH	31552	70.2	67.8	72.9	73.1	75.4	75.6	76.2	71.2	70.5	76.2	75.6	151.8	
5	5	BELIEFF, DAN	12816	68.4	69.4	73.2	71	45	5.7	74.6	72.9	68	74.6	73.2	147.8	
6	6	PASSARELLI, WM.	15623	59.3	62.7	68.7	69.5	72.8	69.9	71.7	69.4	70.7	72.8	71.7	144.5	
7	7	PERSON, LEE	383504	48.4	57.3	63.8	66.8	64.3	71.6	72.1	65	72.3	72.3	72.1	144.4	
8	8	KOPTONAK, JOHN	58027	72.5	66.6	54.4	65	62.9	65.7	70.5	69.3	63	72.5	70.5	143	
9	9	BOEHM, BERNARD	92567	70.1	70	71.6	67.7	67.8	64.5	60.4	61.4		71.6	70.1	141.7	
10	10	JESSUP, ARTIE	10269	63.1	63.2	64.2	68	55.7	65.1	65.8	61.7	70.1	70.1	68	138.1	
11	11	WARMAN, ROBERT	18748	52	59	14	66	68	69	48.5	46.2	2	69	68	137	
12	12	ROMASH, ROBERT	130061	68.8	66.8								68.8	66.8	135.6	
13	13	RASH, FRED	63458	65	63.8	67.8	63.3	64.5	52.4	52.5			67.8	65	132.8	
14	14	VANCIL, JON	338493	41.3	54.2	53.9	57.8	64.5	65.5	65.2	60		65.5	65.2	130.7	

1996 USIC ROG STICK #214

	PLACE	CONTESTANT	AMA NO.	1	2	3	4	5	BEST FLIGHT	GR. CH. PTS
1	1	COSLICK, LAWRENCE	4652	19.55	9.42				19.55	
2	2	RICHMOND, JAMES	4936	19.05	19.36	19.31			19.36	
3	3	SOVA, TOM	473169	0.09	16.28	11.07	0.08	16.17	16.28	
4	4	RASH, FRED	63458	5.28	5.31	9.03	8.54	3.01	9.03	
5		THOMPSON, MICHAEL	1484						DNF	
6		LOUCKA, LARRY	1210						DNF	
7		HACKER, VERNON	L304						DNF	
8		CHILTON, STAN	L30						DNF	
9		BIGGE, WILLIAM	L127						DNF	

1996 USIC MANHATTAN #205

	PLACE	CONTESTANT	AMA NO.	1	2	3	4	5	BEST FLIGHT	GR. CH. PTS
1	1	GRANT, JAMES B.	159477	6.31	11.55	13.35			13.35	
2	2	COSLICK, LARRY	4652	12.09	13.06	13.17			13.17	
3	3	THOMAS, MIKE	F66	12.01	13.14				13.14	
4	4	MARETT, JOHN	F68	12.13	12.4	11.54	13.02		13.02	
5	5	VAN GORDER, WALTER	19912	12.46	12.58	4.26	3		12.58	
6	6	LOUCKA, LARRY	1210	12.02	11.45	6.46	12.32		12.32	
7	7	KOPTONAK, JOHN	58027	7.16	7.55	9.39	11.11		11.11	
8	8	WECKERLY, STUART	13250	5.19	10.25	7.37	10.19		10.25	
9	9	MILLER, RICHARD	179518	8.26	10.14				10.14	
10	10	GANSER, RONALD	7532	10.14	8.04				10.14	
11	11	HENDERSON, F.	F70	8.58	7.52				8.58	
12	12	DIEBOLT, H. J.	97263	4.45	6.22	6.48			6.48	
13	13	RAYMOND JONES, D.	63358	2.42	3.17	3.06	6.31		6.31	
14	14	O'GRADY, DAN	F57						DNF	

	PLACE	CONTESTANT	AMA NO.	1	2	3	4	5	BEST FLIGHT	GR. CH. PTS
15	15	ZUFELT, JAMES	F59						DNF	
16										
17			COMPLETE							
18										
19										
20										
21										
22										
23										
24										
25										
26										
27										

1996 USIC PENNY PLANE # 207

PLACE	CONTESTANT	AMA NO.	1	2	3	4	5	BEST FLIGHT
1	O'GRADY, DAN	MAAC 6192	17.01	15.59	18.16			18.16
2	WISNIEWSKI, GORDON	716	18.14					18.14
3	HARTMAN, PHILLIP	8667	17.08	17.32	15.46	16.29	17.49	17.49
4	HARDCASTLE, R.	847	15.22	16.26	2.09			16.26
5	CLEM, JIM	L-55	12.01	16.24	14.25			16.24
6	COSLICK, LARRY	4652	5.44	6.01	15.41	16.22		16.22
7	ALVIREZ, PHIL	F64	5.04	13.23	6.1	15.53	15.15	15.53
8	KAGAN, JOHN	469254	15.02	14.35	15.47	15.5		15.5
9	GRANT, JIM	159477	8.14	15.3	15.41			15.41
10	THOMAS, MIKE	F66	11.51	15.25	13.11			15.25
11	WARMANN, ROBERT	18748	5.32	11.55	15.17	12.58		15.17
12	VALLEE, THOMAS	1126	15.11	3.35				15.11
13	DELLER, DOUGLAS	F61	13.44	14.35	15.05	13.41	5.03	15.05
14	OBARSKI, DICK	560	12.04	12.31	14.48	15.03	10.04	15.03
15	OLSHEFSKY, P.	MAAC 864L	14.44	10.07	11.41	14.56	13.05	14.56
16	JOSHU, EUGENE	260643	6	14.29	13.43	13.57	13.01	14.29
17	GANSER, JOHN	179424	13.22	9.09	14.12	3.54		14.12
18	ROMASH, ROB	130061	14.08					14.08
19	HENDERSON, W.	F70	13.49	12.16	5.13	12.38	8.04	13.49
20	NOLIN, GERVAIS	12306	11.59	9.38	12.55	13.26		13.26
21	SOVA, TOM	473169	11.3	12.12	12.33	12.31	2.59	12.33
22	FELLIN, JOHN	95353	11.32	10.45	8.04	8.51	12.22	12.22
23	HACKER, V.	L304	6.39	10.55	12.05	12.09		12.09
24	KIRBY, NOEL	267885	4.19	12.08				12.08
25	RASH, FRED	63458	4.41	3.29	3.59	11.58		11.58
26	LANDRUM, BILLIE	52674	10.33	11.07	6.13	11.55		11.55
27	BOONE, JACK	107857	7.46	9.07	9.56	11.22	11.51	11.51
28	EBERLE, ROB	411592	9.34	9.07	11.44	11.08		11.44
29	ZUFELT, JAMES	F59	9.24	9.22	10.05	11.1	9.05	11.1
30	VANCIL, MARK	124866	11.06	7.24	9.43	8.16		11.06
31	BARBER, DOUGLAS	56270	8.54	10.46	9.48			10.46
32	SULLIVAN, EDWARD	69585	5.12	7.32	8.1	9.28		9.28
33	RAYMOND JONES, D.	63358	9.1					9.1
34	LEONARD, NICK A.,JR.		8.47	7.1				8.47
35	ITALIANO, A.J.	2386	7.29	7.43	8.2	8.46		8.46
36	KENT, MOCHAEL	9784	5.21	6.53	3.45			6.53
37	LOUKA, LARRY	1210						DNF
38	LEONARD, NICK A.							DNF

1996 USIC BOSTONIAN #215

	PL.	CONTESTANT	AMA NO.	1	2	3	4	5	FLIGHT	FLIGHT 2	BEST 2	CHARISMA	TOTAL
1	1	MILLER, RICHARD	179518	5.29	5.16	4.59	3.01		5.29	5.16	6.45	1.18	761
2	2	THOMAS, MIKE	F66	5.17	5.03	3.41	5.3	4.48	5.03	5.3	6.33	1.14	738
3	3	THOMPSON, M.	1484	5.29	2.04	5.25	4.39		5.29	5.25	6.54	1.12	732
4	4	GRANT, JAMES B.	159477	3.37	4.53	4.23			4.53	4.23	5.56	1.17	650
5	5	COSLICK, LARRY	4652	4.49	2.14	4.15	4.02	4.14	4.43	4.15	5.44	1.18	641
6	6	BARKER, JOHN	2095	3.24	3.5	4.43	4.41	4.17	4.43	4.41	5.64	1.13	637
7	7	PASSARELLI, WM.	15623	3.48	4.18				3.48	4.18	4.86	1.16	563
8	8	PAVEK, WILLIAM	319915	4.28	3.32	1.31			4.28	3.32	4.8	1.12	537
9	9	HENDERSON, W.	F70	2.37	3.36	3.34			3.36	3.34	4.3	1.12	481
10	10	STEVENS, HERBERT	13086	2.09	2.59	2.3	3.59		2.59	3.59	4.18	1.14	476
11	11	KROL, GREGORY	514743	2.5	3.46	2.29	2.22		2.5	3.46	3.96	1.15	455
12	12	SEAVER, TED	397871	2.29	1.08	3	2.58	3.38	3	3.36	3.98	1.13	449
13	13	KAGAN, JOHN	469254	0.15	2.27	2.58	3		2.58	3	3.58	1.16	415
14	14	BLAIR, J.	29698	1.38	2.22	2.37	2.48	3.09	3.09	2.48	3.57	1.14	406

	PL.	CONTESTANT	AMA NO.	1	2	3	4	5	FLIGHT	FLIGHT 2	BEST 2	CHARISMA	TOTAL
15	15	GILBERT, S.	1803	2.26	2.38	2.24			2.26	2.38	3.04	1.1	334
16	16	RASH, FRED	63458	2.17	1.46				2.17	1.46	2.43	1.09	264
17		OLESON, DOUGLAS	480646										DNF
18		MAC ENTEE, R.	102085										DNF

1996 USIC 35 CM

	PLACE	CONTESTANT	AMA NO.	1	2	3	4	5	BEST FLIGHT	GR. CH. PTS
1	1	SOVA, TOM	473169	18.37	18.47	21.18	23.06		23.06	
2	2	O'GRADY, DAN	F57	20.59					20.59	
3	3	ROMASH, ROB	130061	15.52	16.44	19.35	19.42		19.42	
4	4	FELLIN, JOHN	95353	4.58	10.1	14.29	15.16	17.21	17.21	
5	5	MAREK, DAN	2350	16.53	8.02	15.4	13.57		16.53	
6	6	RAYMOND-JONES,D.	63358	7.09	9.13	12.45			12.45	
7	7	VALLEE, THOMAS	1126	8.04					8.04	
8	8	ZUFELT, JAMES	F59	7.54					7.54	
9		THOMPSON, M.	1484						DNF	
10		OLSHEFSKY, P.	MAAC864L						DNF	
11		NUSZER, J.	29036						DNF	
12		LANDRUM, B.	52674						DNF	
13		CHILTON, STAN	L30						DNF	
14		BIGGE, WILLIAM	127L						DNF	
15										

Photo Captions

1. John Kagan and his lucky F1D. This model survived over thirty ceiling bumps on a single flight without damage or getting hung up.
2. Ted Seaver launching his twin finned mini stick. Mini sticks are very quick to build and quite popular.
3. Dan O'Grady launching his winning Pennyplane for a new site record of 18:16
4. Rich Miller, Roy White, and Dr. Walter Erbach , old friends taking a break between rounds.
5. Dr. Vern "Lighter than Air" Hacker and his semi-ridged Intermediate Stick.
6. Lee Person and Mike Thompson compare catapult gliders.
7. John Barker launching his EZB. John and George Perryman fly outdoor together.
8. Jim Miller winding his FAC scale Voison Hydroplane. This interesting little bundle of detail flies very well.
9. Dave Rees and his beautiful violet and gold Coconut scale MB-3.
10. Bob Clemens and his no-cal ARUP. Trimming began right after this photo was taken.
11. DH-4 peanut prototype of the MAL kit built by Dale Hogue. One of several good looking new kits offered by MAL.
12. Harmonica equipped Rich Miller and his float equipped Currie Wot FAC scale. Model flies, Miller dances a jig with harmonic self accompaniment. Fun to watch both!
13. Larry Cailliau with his winning EZB. Set site record of 29:25.
14. Dr. Martin and his cute little peanut scale Lemberger homebuilt biplane.
15. Don Brimmer and his wonderful no-cal XB-70 Valkrye. Ultra low aspect ration model flew very well.
16. Bob Clemens' Langly Aerodrome. Tandem winged twin pusher managed a very creditable 51 second flight.
17. John Marett unleashes his Manhattan Cabin to win fourth place.
18. Doug Barber flying his EZB. With very light models and extremely high flight times EZB is fast becoming a specialty event.
19. Jim Clem with his 1st place trophy in P-24. This is the second year Jim has won this event!
21. Cessna C-38 Airmaster by Jack McGillivary floats by in the golden age event.
22. Charles Schultz displays a very pretty sport model to illustrate the scale and sport plans he sells.
23. Nick Leonard and his ROG Cabin. He used Polymicro this year, but will be using microfilm next year. This is a very demanding event for anyone, regardless of experience.
24. Bill Pasarelli had a nice flying Bostonian of unusual configuration.
25. Bob Clemens P.A.M.A. , a french homebuilt that he flew in High Wing Monoplane class.
26. Rob Eberly accepting the award for second place in Hand Launch Glider
27. Ed Ripley and his Pistachio scale Sperry parasol.

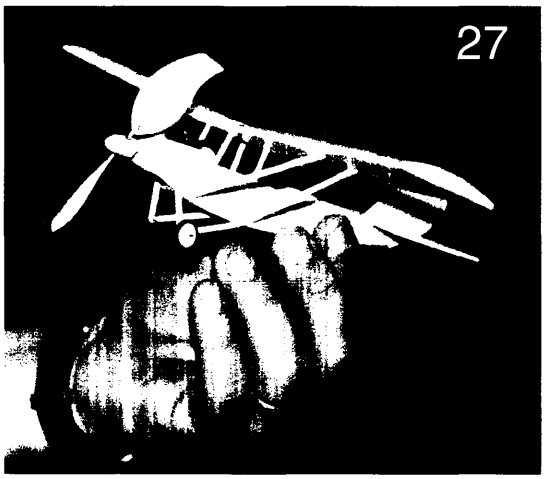
28.(top) Larry Peavey with his no-cal Grumman F4F Wildcat.

28. Jim Grant's Plan Scale Rearwind Speedster in blue and yellow.
29. Dan Beles with his Intermediate Stick .
30. Platus Turbo Porter by Rich MacEntee was the winner of Coconut Scale.
31. Jim Grant and his mercurochrome pink Intermediate Stick.
32. Billie Landrum and his super flying Coconut Scale Cessna -01 Birddog. Model used the whole building when flying!
33. Larry Coslick's newly designed Manhattan Cabin, "the Joker" took 2nd place.
34. Holly Vonasek managed a respectable 125.1 sec. with her catapult glider.
35. Mid-air collisions are very common when the air is so very crowded. This one resulted in no damage to either intermediate stick involved.
36. Repair Time! John Kaptovak heals his Spartan's wounds for the next flight.
37. Bob Romash's pretty little electric sport model flew very well on just two 50 milliamper cells!
38. Gene Joshu and his fine flying Pennyplane, crafted on the spot from the remains of his primary and back-up planes.
39. Stan Chilton and his winning Intermediate Stick posted a 38:10


23


24
FLYING
July 1994


28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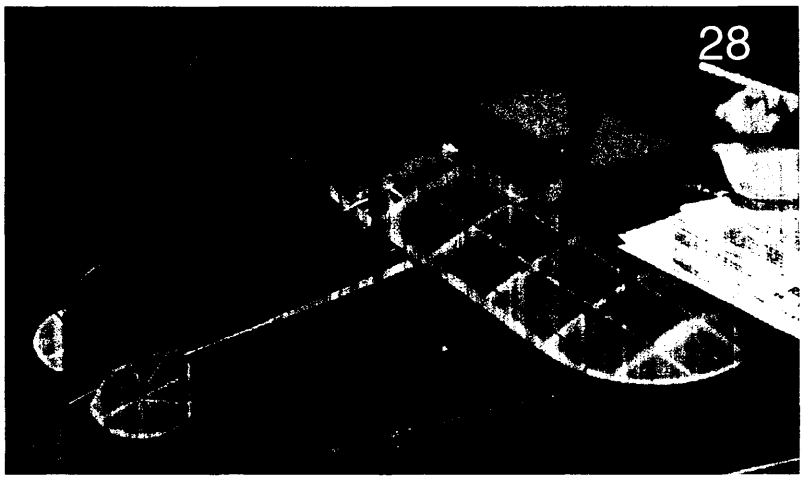
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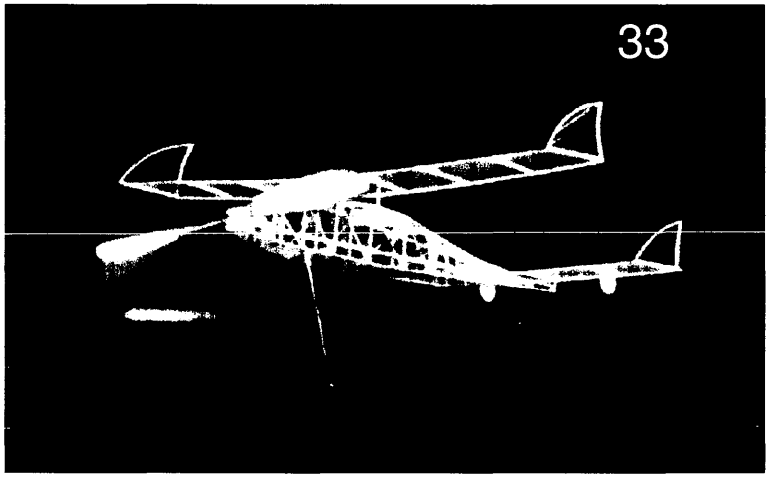
U.S. ARMY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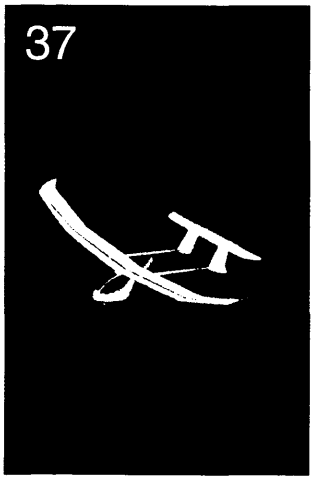
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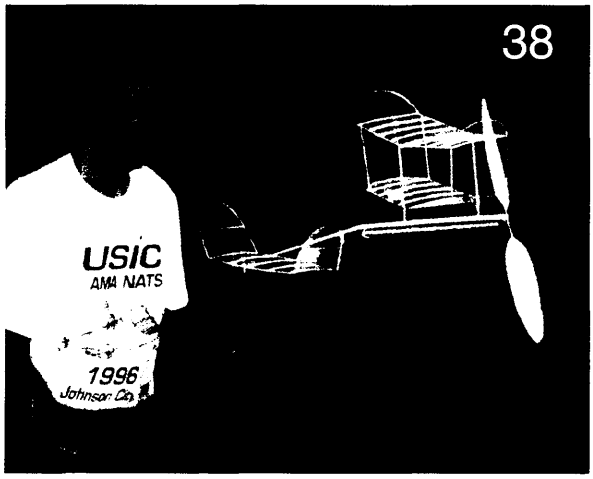
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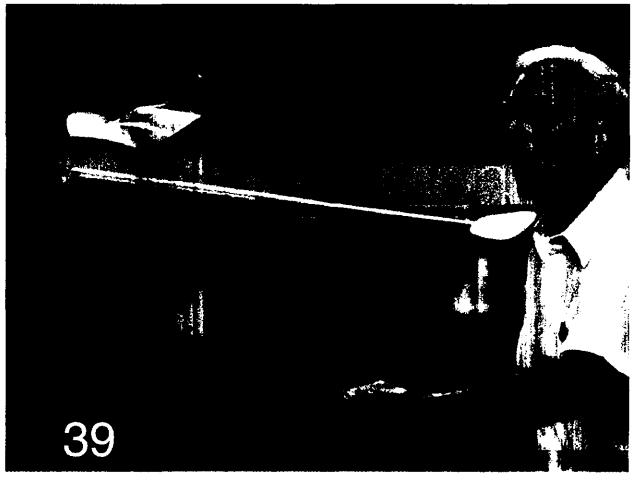
USIC
AMA NATS
1996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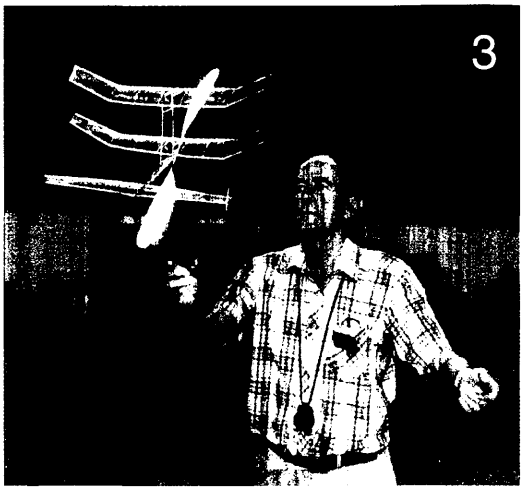
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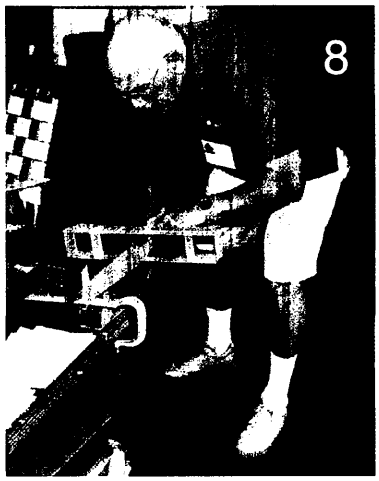
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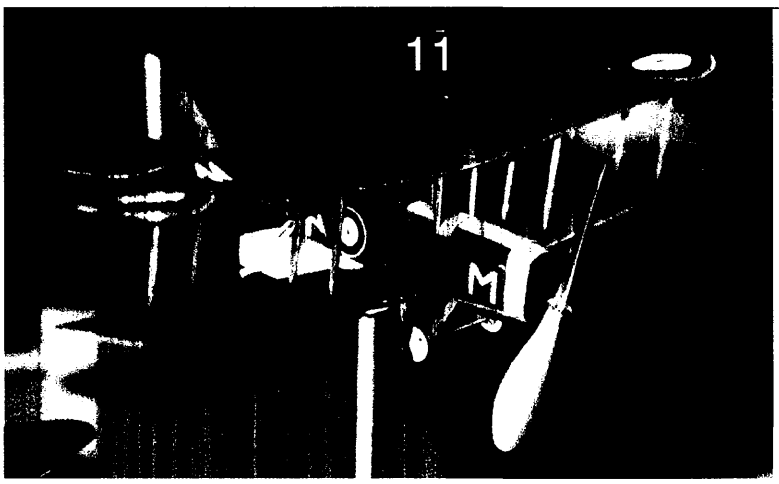
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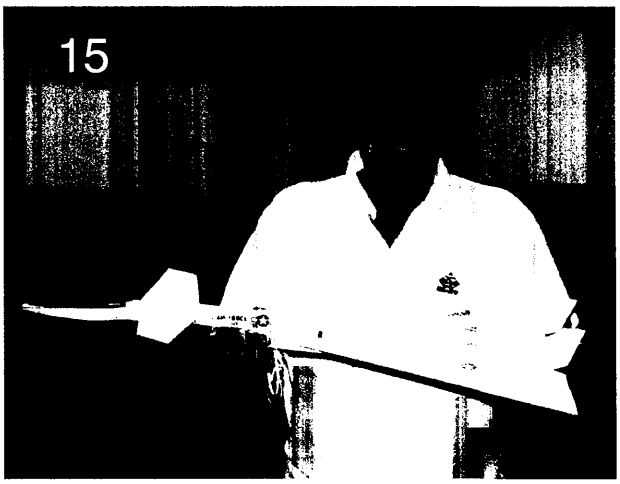
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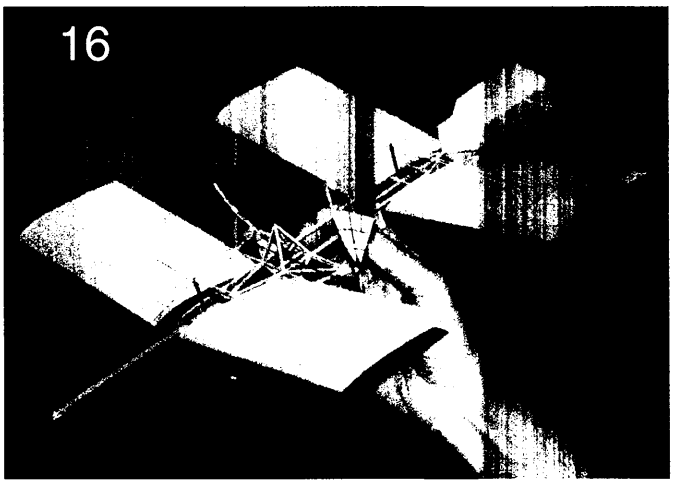
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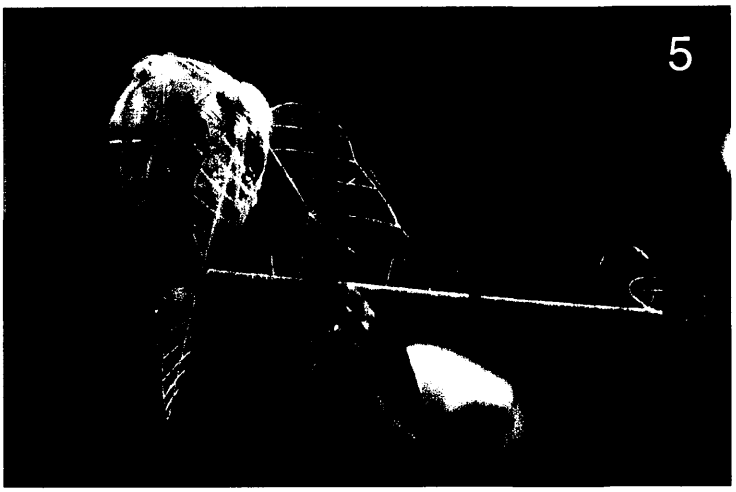
AMA NATS
1996
Johnson City, TN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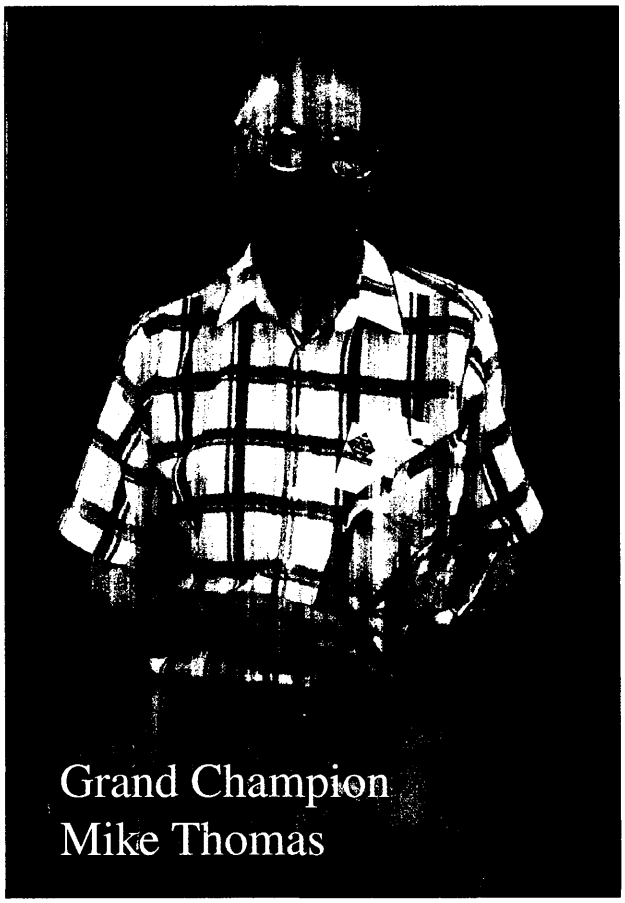
Grand Champion
Mike Thomas


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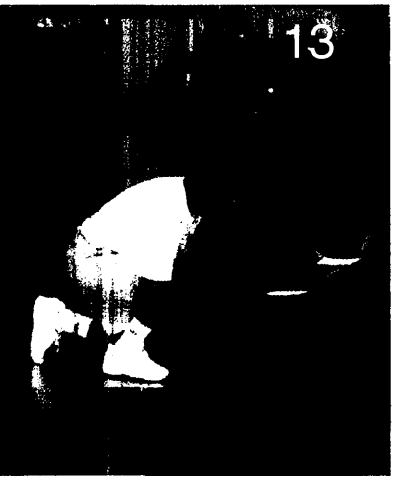
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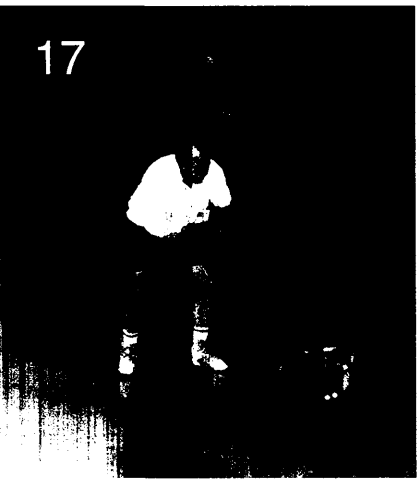
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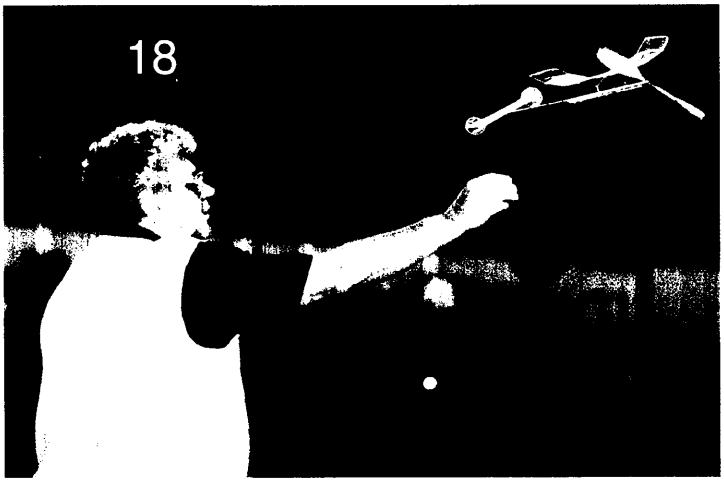
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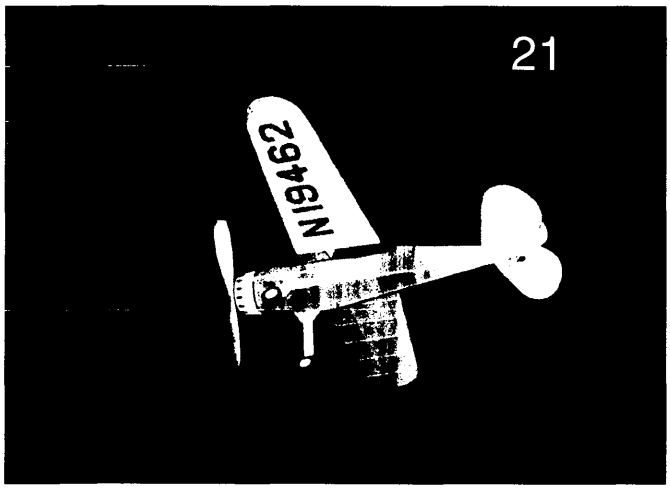
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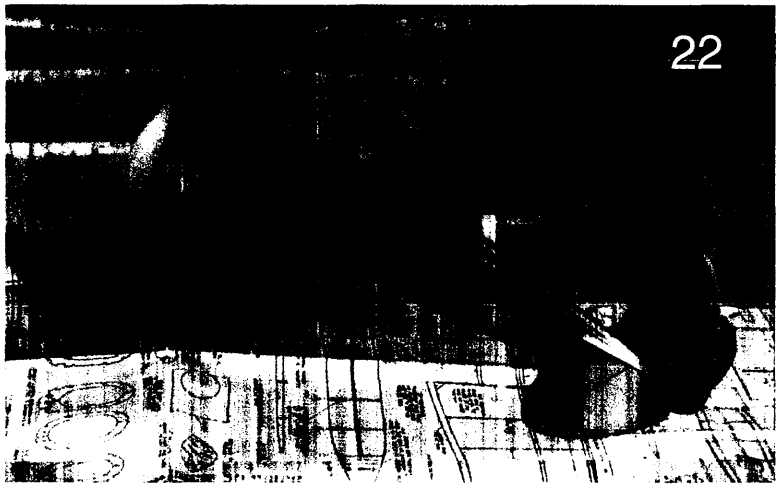
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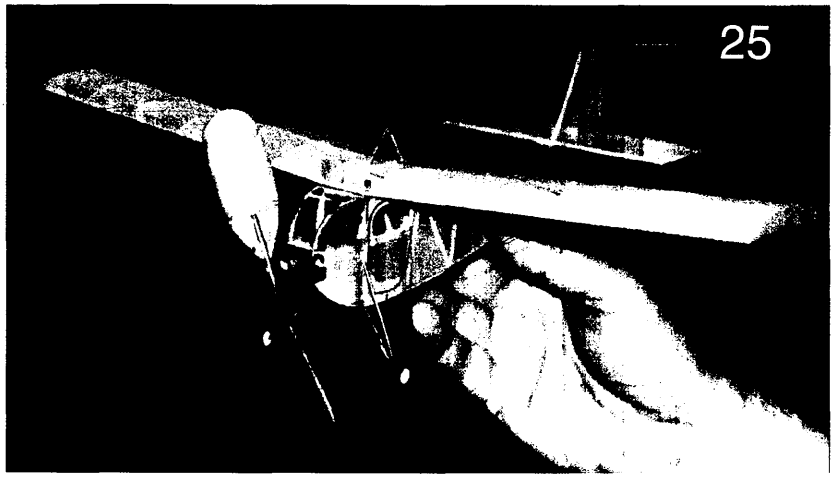
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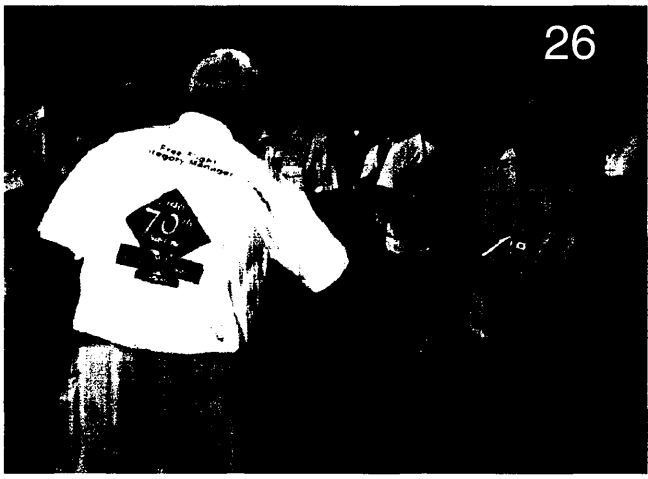
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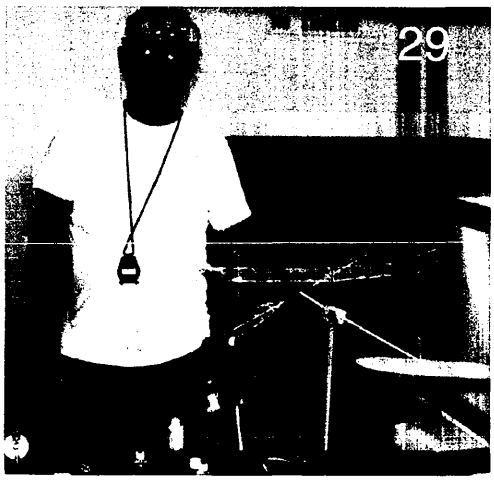
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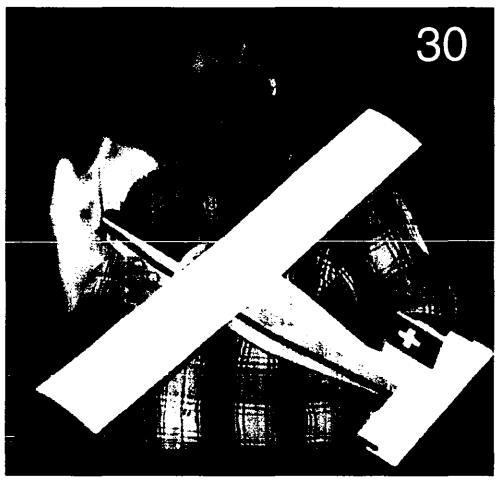
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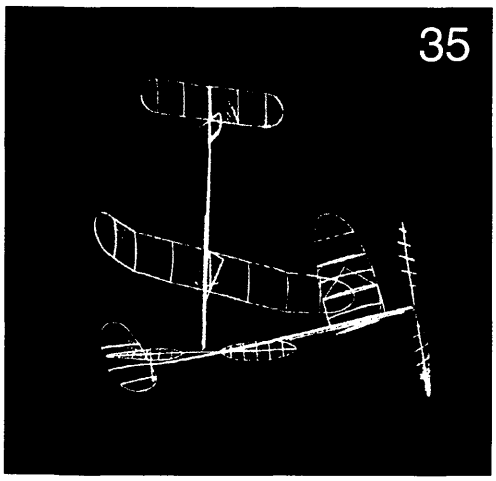
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1996 USIC LIMITED PENNYPLANE #208

	PLACE	CONTESTANT	AMA NO.	1	2	3	4	5	BEST FLIGHT
1	1	THOMAS, MIKE	F66	14.12	15.39				15.39
2	2	VAN GORDER, W.	19912	13.16	15.34				15.34
3	3	MCGILLIVRAY, JACK	F65	5.55	15.08	13.34	15.27		15.27
4	4	COSLICK, LARRY	4652	12.29	13.51	15.01	4.27	4.09	15.01
5	5	PAVEK, WILLIAM	319915	14.59					14.59
6	6	EBERLE, J. ROBERT	4117	14.27	14.16	14.53	2.54		14.53
7	7	RICHMOND, JAMES	4936	12.41	14.21	14.37	2.46	14.19	14.37
8	8	O'GRADY, DAN	MAAC 6192	10.19	3.51	14.24	14.18	13.45	14.24
9	9	ALVIREZ, PHIL	F64	14.2	14.12	14.12	13.25	14.16	14.2
10	10	GANSER, JOHN	179424	12.43	13.08	14.11	14.16	13.35	14.16
11	11	CLEM, JIM	L-55	12.18	12.39	11.33	14.12	7.58	14.12
12	12	HARTMAN, PHILLIP	8667	13.52	14.02	4.3	12.42	9.59	14.02
13	13	GRANT, JIM	159477	14.02	5.07	9.25	13.1	12.1	14.02
14	14	WECKERLY STUART	13250	10.59	13.36	13.58	10.01	2.22	13.58
15	15	EBERLE, ROB. SR.		7.14	7.45	0.05	2.54	13.56	13.56
16	16	OLSHEFSKY, PETER	MAAC864L	12.01	13.43	13.33	12.41	3.26	13.43
17	17	KAGAN, JOHN	469254	12.44	13.43	13.2	11.36	12.23	13.43
18	18	WHITE, ROY	6300	13.23	12.34	13.38	13.4	2.46	13.4
19	19	NOLIN, GERVAIS	12306	7.32	13.21	13.31	11.55	12.06	13.31
20	20	HARDCASTLE, R.	847	11.53	13.04	11.36	10.01	12.08	13.04
21	21	MARETT, JOHN	F68	12.15	12.57	2.54	8.15	11.43	12.57
22	22	DIEBOLT, H.J.	97263	12.57	3.05	4.44	10.38		12.57
23	23	BARKER, JOHN	2095	11.48	10.24	11.56	10.41	12.54	12.54
24	24	ROMASH, ROB	130061	12.39					12.39
25	25	DELLER, DOUGLAS	F61	12.13	12.36	11.39	3.57		12.36
26	26	THOMPSON, M.	1484	11.47	12	11.18	11.42	12.35	12.35
27	28	SOVA, TOM	473169	9.59	12.31	4.21			12.31
28	28	HENDERSON, W	F70	11.59	10.59	12.29			12.29
29	29	HACKER, VERNON	L304	10.35	11.38	12.25	10.18	11.44	12.25
30	30	OBARSKI, DICK	560	11.57	3.2	12.22	9.26		12.22
31	31	GANSER, RONALD	7532	11.09	12.22	11.27			12.22
32	32	BARBER, DOUGLAS	56270	10.47	4.14	11.53	12.16		12.16
33	33	KROL, GREGORY	514743	4.01	12.13	9.58			12.13
34	34	KIRBY, NOEL	267885	11.16	11.37	12.09			12.09
35	35	SEAVER, TED	397871	10.52	10.41	12.03	9.22	8.48	12.03
36	36	BROCKS, K. PETER	84018	9.04	6.14	11.38	12.03	7.01	12.03
37	37	FELLIN, JOHN	95353	9.06	7.18	8.55	12	11.56	12

	PLACE	CONTESTANT	AMA NO.	1	2	3	4	5	BEST FLIGHT
38	38	ZUFELT, JAMES	F59	11.25	11.55	11.41	11.57	7.3	11.57
39	39	KOPTONAK, JOHN D.	58027	9.58	8.26	5.26	10.3	11.57	11.57
40	40	WISNIEWSKI, G.	716	11.37	11.02	11.53	10.19	4.58	11.53
41	41	JOSHU, EUGNE	260643	10.36	11.52	7.2			11.52
42	42	VALLEE, THOMAS	1126	9.35	11.07	11.45	4.14		11.45
43	43	VONASEK, HOLLY	529113	8.58	9.51	11	11.05	11.19	11.19
44	44	ARCHIBALD, JOHN	192711	8.31	11.19	11.11	9.17		11.19
45	45	WARMANN, ROBT.	18748	2.54	11.09	3.09			11.09
46	46	SINGER, LEN	209081	7.07	8.18	10.51			10.51
47	47	MAREK, DAN	2350	9.55	9.33	7.35	10.3		10.3
48	48	ITALIANO, A.J.	2386	9.46	9.02	9.31	10.2	9.39	10.2
49	49	WRZOS, CHESTER	20454	5.59	8.16	10.1	8.14		10.1
50	50	BOONE, JACK	107857	9.43	10.05				10.05
51	51	RIPLEY, EDWARD	484619	5.34	9.28	9.59	9.02	7.55	9.59
52	52	LEONARD, NICK, SR.	497461	9.58	7.29				9.58
53	53	STEVENS, HERBERT	13086	7.09	5.34	9.16	9.41	9.56	9.56
54	54	LEONARD, NICK, JR.	497460	9.59					9.59
55	55	RAYMOND JONES,D.	63358	8.56	9.44	9.08			9.44
56	56	KENT, MICHAEL P.	F63	2.19	7	8.59	8.05	6.51	8.59
57	57	SEMERARO, BART	460910	7.28	2.44	8.03	8.03	8.22	8.22
58	58	WALTON, NICK	397340	8.03	7.18				8.03
59	59	LANDRUM, BILLIE	52674	6.08	3.38				6.08
60	60	SULLIVAN, EDWARD	69585						DNF
61	61	PERSON, LEE	383504						DNF
62	62	OLESON, DOUGLAS	480646						DNF
63	63	MILLER, RICHARD	179518						DNF
64	64	LOUCKA, LARRY	1210						DNF
65	65	BIGGE, L.	L127						DNF

1996 USIC PEANUT SCALE #505

	PL.	CONTESTANT	AMA NO.	SUBJECT	1	2	3	4	5	6	7	SCALE SC	BEST FLT	BEST MAX	2ND FLT	2ND MAX	AVG*	SCALE**
1	1	MCGILLIVRAY, JACK	F65	VOISIN	84	97	106					137.5	106	106	97	97	101.5	239
2	2	GANSER, RONALD	7532	VOISIN	1.4	112	0.05	0.96				123.75	112	112	100	100	106	229.75
3	3	THOMPSON, M.	1484	FAIRMAN	119	103	105	114	102	101	116	107.5	119	107.5	116	107.5	107.5	215
4	4	PASSARELLI, W.	15623	PAMA	112	132						100	132	100	112	100	100	200
5	5	MARTIN, JOHN	712	LEMBERGER	83	80	55	69	75	70	75	88	83	83	80	80	81.5	169.5
6	6	BLAIR, JOHN	29698	ALCO SPORT	43	67	82	101				82	101	82	82	82	82	164
7	7	HENDERSON, W.	1336L	BLERIOT	85	81						76	85	76	81	76	76	152
8	8	WECKERLY, STUART	13250	DH-6	13	72	15	66	64			71.75	72	71.75	66	66	68.8	140.55
9	9	BRIMMER, DONALD	1097	LACEY	54.8	22	41					80	54.8	54.8	41	41	47.9	127.9
10	10	ROMASH, ROB	130061	HUNTINGTON	68	71	62					61.25	71	61.25	68	61.25	61.25	122.5
11	11	KOPTONAK, JOHN	58027	BRISTOL SCOUT	39	39						82	39	39	39	39	39	121
12	12	MAC ENTEE, R.	102085	ALCO SPORT	34							94.5	34	34			17	111.5
13	13	SCHLESINGER, W.	5954	FIKE	42.1	44.9	44					61.25	44.9	44.9	44	44	44.4	105.65
14	14	KROL, GREGORY	514743	CURTIS J'N	38	51	52	59				71.75	59	59			29.5	101.25
15	15	STEVENS, HERB	13086	SE5	29							86	29	29			14.5	100.5
16	16	MILLER, RICHARD	179518	J-3								72						

1996 USIC KIT PLAN SCALE #213

	PL.	CONTESTANT	AMA NO.	SUBJECT	1	2	3	4	5	BT.MAX	2ND FLT	2ND (MAX)	FIDEL. PNTS	CRAFT PTS	BEST 2 FLTS	TOTAL
1	1	BLAIR, JOHN	29698	FAIRCHILD RANGER	99	77	98			92		92	57	35	184	276
2	2	MILLER, R.	179518	HOWARD DGA-9	131	110				92		92	57	35	184	276
3	3	GRANT, JAMES	159477	TAYLORCRAFT	87	106	97			92	92	92	58	34	184	276
4	4	MAC ENTEE, R.	102085	DAPHINE	88	83	105			87		87	50	37	174	261
5	5	MARTIN, JOHN	712	DORNIER KOMET	88	68	79	76	81	78		78	58	20	150	228
6	6	MOON, ROGER		CORBIN	58	50	54	67		58		67	54	25	125	204
7	7	BRIMMER, DONALD	1097	TAYLORCRAFT	57					57			80	33	57	150
8		RAYMOND JONES,D.	63358													DNF
9		PASSARELLI, W.	15623													DNF
10		OLESON, D.	480646													DNF

1996 USIC FLYING RUBBER SCALE #507

	PL.	CONTESTANT	AMA NO.	SUBJECT	1	2	3	4	BEST FLT	2ND FLT	AVG. BEST 2	TIME PTS	SCALE PTS	TOTAL PTS
1	1	GANSER, RONALD	7532	1911 CESSNA	1:49	2:00			2:00	1:49	0:90	90	97	187
2	2	MCGILLIVRAY, JACK	F65	SE-5	1:04	1:13	0:90	0:90	0:90	0:90	0:90	90	93	183
3	3	BLAIR, JOHN	29698	CHURCH MIDWING	1:01	1:27	1:13	1:30	0:90	87:00	0:885	88.5	90.5	179
4	4	GRANT, JAMES B.	159477	CLA-3	1:16	1:08			0:76	0:68	0:72	72	81	153
5	5	PASSARELLI, W.	15623	COUGAR	2:09	1:43			0:90	0:90	0:90	90	62	152
6	6	WECKERLY, STUART	13250	FOUND	1:59	2:04			0:90	0:90	0:90	90	45.5	135.5
7		KOPTONAK, JOHN	58027											

1996 USIC EZB #206

PLACE	CONTESTANT	AMA NO.	1	2	3	4	5	BEST FLIGHT
1	CAILLIAUL, L.	XXXXX	28:35	21:43	28:02	29:25		29:25
2	COSLICK, LAWRENCE	4652	24:52	28:57	7:10			28:57
3	MCGILLIVRAY, JACK	MAAC1025L	24:38	26:54	20:45			26:54
4	THOMAS, MIKE	F66	22:30	26:08				26:08
5	VAN GORDER, W.	19912	16:23	20:29	24:50			24:50
6	GRANT, JIM	159477	19:24	20:59	ATT	5:19	4:48	20:59
7	HARDCASTLE, R.	847	3:35	6:45	19:39	20:55		20:55
8	ROMASH, ROB	130061	19:22	20:40	10:30			20:40
9	OLSHEFSKY, P.	MAAC864L	20:36	17:47	15:49	14:22		20:36
10	JOSHU, EUGENE	260643	9:45	20:32	ATT	14:31		20:32
11	O'GRADY, DAN	MAAC6192	9:00	12:10	18:07	20:24		20:24
12	CHILTON, STAN	L30	15:15	19:20	20:24			20:24
13	WECKERLY, STU	13250	3:10	11:53	18:38	13:41		19:41
14	DELLER, DOUGLAS	F61	4:31	10:26	19:08			19:08
15	FELLIN, JOHN	95353	15:27	17:32	18:50	18:07	6:24	18:50
16	WISNIEWSKI, GORD	716	17:44	2:47	18:46	7:41	4:40	18:46
17	SOVA, TOM	473169	17:08	13:34	18:32	16:15	ATT	18:32
18	MARETT, JOHN	MAAC65IL	7:26	17:30	13:35	18:10	12:09	18:10
19	ARCHIBALD, JOHN	192711	16:12	18:08	14:00			18:08
20	GANSER, JOHN	179424	17:29	18:01	11:16			18:01
21	NOLIN, GERVAIS	12306	14:50	17:34	9:36			17:34
22	OBARSKI, DICK	560	17:20	16:54				17:20
23	MILLER, RICHARD	179518	9:22	15:32	17:14			17:14
24	MAREK, DAN	2350	11:03	16:56	5:32			16:56
25	VALLEE, THOMAS	1126	14:29	7:06	16:49	4:07		16:49
26	ITALIANO, A.J.	2386	6:42	16:02	11:46	14:58	12:10	16:02
27	BARKER, JOHN	2095	15:36	9:30	8:29	10:40		15:36
28	ZUFELT, JAMES	F59	11:53	15:20	12:49			15:20
29	WRZOS, CHESTER	20454	15:03	8:32				15:03
30	BARBER, DOUGLAS	56270	10:48	13:15	13:07			13:15
31	RAYMOND JONES, D.	63358	11:17	11:10	13:02			13:02
32	CHIZMADIA, JOHN	33580	10:26	4:34	10:07			10:26
33	HACKER, VERNON	L304	9:35	1:16				9:35
34	SINGER, LEN	209081	7:41					7:41
35	CLEM, JIM	L55	6:34	5:98				6:34
36	KAGAN, JOHN	469254	5:09	1:27	21:31	22:13		2:13
37	HENDERSON, W.	F70	ATT					0:00
38	WHITE, ROY	6300						DNF
39	VANCIL, JON D.	338493						DNF
40	RICHMOND, JAMES	4936						DNF
41	LOUCKA, LARRY	1210						DNF
42	HARTMAN, PHILLIP	8667						DNF
43	EBERLE, ROB							DNF

USIC 1996 MINISTICK #220

PLACE	CONTESTANT	AMA NO.	1	2	3	4	5	BEST FLIGHT
1	CAILLIAU, L.	79985	12:20	4:53	4:16	6:19		12:20
2	COSLICK, LAWRENCI	4652	12:17	3:58				12:17
3	ROMASH, ROB	130061	10:52	11:08	12:11			12:11
4	ALVIREZ, PHIL	F64	3:16	10:36	11:06	11:47	10:50	11:47
5	EBERLE, J. ROBERT	4117	11:22	11:00	9:26	7:44		11:22
6	O'GRADY, DAN	MAAC6192	9:54	9:13	11:19			11:19
7	VAN GORDER, W.	19912	10:48	10:55				10:55
8	CLEM, JIM	L55	10:54	10:42				10:54
9	THOMPSON, MICHAE	1484	10:16	10:40				10:40
10	KOPTONAK, JOHN	58027	8:20	7:02	7:39	8:39	10:37	10:37
11	VANCIL, MARK	338493	9:31	10:33				10:33
12	EBERLE, ROB	411592	7:53	4:30	10:32			10:32
13	OBARSKI, DICK	560	10:23	7:59	10:26			10:26
14	HENDERSON, W.	F70	7:23	9:54	7:49	7:57		9:54
15	PERSON, LEE	383504	4:14	9:49	9:36			9:49
16	WECKERLY, STU	13250	7:57	8:45	9:49			9:49
17	WHITE, ROY	6300	:34	:21	9:37			9:37
18	SINGER, LEN	209081	9:35	8:45				9:35
19	GANSER, JOHN	179424	8:44	9:16				9:16
20	KAGAN, JOHN	469254	5:29	9:10	8:32	8:02		9:10
21	OLSHEFSKY, P.	MAAC864L	8:53	7:15	8:42	6:01		8:53
22	VANCIL, JON	338493	8:09	7:14	6:31	8:44		8:44
23	SOVA, TOM	473169	8:43	6:11				8:43
24	HARDCASTLE, R.	847	8:30					8:30
25	PAVEK, WILLIAM T.	319915	8:04	2:19				8:04
26	RIPLEY, ED	484619	4:51	6:05	7:27	7:55		7:55
27	KENT, MICHAEL	F63	7:50					7:50
28	DELLER, DOUGLAS	F61	7:20	7:38				7:38
29	WALTON, NICK	397340	7:38					7:38
30	VALLEE, THOMAS	1126	:50	7:32				7:32
31	NOLIN, GERVAIS	12306	8:16	7:28				7:28
32	FELLIN, JOHN	95353	6:34	6:56	6:11			6:56
33	SEAVER, TED	397891	6:53	3:57	6:35			6:53
34	KELLY, JAMES	37564	5:32	5:47	5:14	6:43		6:43
35	HACKER, VERNON	L304	4:38	6:04				6:04
36	RAYMOND JONES, D.	633358	5:52	5:37				5:52
37	DIEBOLT, H.J.	97263	2:42					2:42
38	BARBER, DOUGLAS	56270						DNF
39	CHILTON, STAN	L30						DNF
40	GRANT, JIM	159477						DNF
41	JOSHU, EUGENE	260643						DNF
42	MILLER, RICHARD J.	179518						DNF
43	SULLIVAN, EDWARD	69585						DNF
44	WARMAN, ROBERT	18748						DNF

1996 USIC FAC SCALE

	PLACE	CONTESTANT	MODEL	SCALE SCORE	BEST FLT/SECS.	FLT. SCORE	SC + FLT SCORE
1	1	MCGILLIVARY, J.	VOISIN	90	94	76	166
2	2	MILLER, RICHARD	WET WOT	81	94	76	157
3	3	MILLER, J.	VOISIN	92	65	62.5	154.5
4	4	REES, D.	MB-3	66	120	82.5	148.5
5	5	CLEMENS, BOB	TANGLEY AERODROME	97	51	51	148
6	6	PASSERELLI, W.	NESMITH COUGAR	62	120	82.5	144.5
7	7	MARTIN, JOHN	LEMBERGER	70	72	66	136
8	8	WECKERLY, STU	STOUT 2-AT	53	120	82.5	135.5
9	9	PEAVEY, LARRY	BELLANCA	67	73	66.5	133.5
10	10	LANDRUM, B.	CESSNA 0-1	54	86	73	127
11	11	MAC ENTEE, RICH	WACO SRE	64	63	61.5	125.5

1996 USIC HIGH WING MONO

	PLACE	CONTESTANT	MODEL	SCALE SCORE	BEST FLT/SECS.	FLT. SCORE	TOTAL
1	1	PASSERELLI, W.	P.A.M.A.	62.5	120	92.5	145
2	2	THOMPSON, M.	LACEY M-10	60	82.5	82.5	142.5
3	3	WECKERLY, S.	STOUT 2-AT	52	120	82.5	134.5
4	4	MILLER, J.	HI-MAX	62.5	80	70	132.5
5	5	MAC ENTEE, R.	LACEY M10	45	113	80.75	125.75
6	6	CLEMENS, R.	P.A.M.A	60	68	64	124
7	7	GILBERT, S.	LACEY	36	112	80.5	116.5
8	8	BLAIR, J.	WHITE MONO	48	60	60	108
9	9	BRIMMER, D.	LACEY M10	53	54	54	107
10	10	PEAVEY, L.	FOUND	29	66	63	92
11	11	LAZARUS, K.	ALCO SPORT	44	38	38	82
12	12	SCHLESSINGER, W.	COUGAR	39	30	30	69

1996 USIC UNLIM RBR SPEED.

	PLACE	CONTESTANT	AMA NO.	1	2	3	4	5	6	7	BEST MPH
1	1	COSLICK, L.	4652	6.47	6.1	6.15	6.02				6.02
2	2	PAVEK, W.	319915	8.53	8	8.41	7.78	8.16	7.63		7.63
3	3	SOVA, TOM	473169	7.76	9.91						7.76
4	4	HENDERSON, W.	1336L	11.65							11.65
5	5	DEBOLT, T.J.	97263								DNF
6	6	HACKER, VERNON	L304								DNF

1996 USIC FROG

	PLACE	CONTESTANT	AMA NO.	1	2	3	4	5	BEST FLIGHT	GR. CH. PTS
1	1	SOVA, TOM	473169	6.34	7.02	7.52			7.52	
2	2	SEAVER, E.	397891	5.18	7.13	6.57			7.13	
3	3	HENDERSON, NEAL	MAAC1336L	5.19	6.19	6.04	5.41	6.22	6.22	
4	4	BAIRD, D.	29698	5.08	5.01	1.55			5.08	
5	5	RIPLEY, ED	484619	2.19	3.23				3.23	
6		DIEBOLT, J.	97263						DNF	
7		CLEM, J.	L-55						DNF	
8		BARBER, D.	56270						DNF	
9										
10										
11										
12										
13										
14										

1996 USIC PRO 20

	PLACE	CONTESTANT	AMA NO.	1	2	3	4	BEST FLIGHT	GR. CH. PTS
1	1	LOUCKA, L.	1210	23.41	24.18			24.18	
2	2	SOVA, TOM	473169	21.37	4.47			21.37	
3	3	MAREK, DAN	2350	11.12	13.55	14.22	16.21	16.21	
4	4	RAYMOND-JONES, C.	MAAC13157	7.48	12.45	9.33		12.45	
5		RASH, FRED	63458					DNF	
6		PEAVEY, L.	365002					DNF	
7		LANDRUM, BILLIE	52674					DNF	
8		THOMPSON, MICHAEL	1484					DNF	
9									
10									
11									
12									
13									
14									

1996 USIC MASS LAUNCH P-24

	PLACE	CONTESTANT	AMA NO.	BEST FLIGHT
1	1	CLEM, JIM	L55	5:25
2		WECKERLY, STU	13250	
3		SEAVER, TED	397891	
4		PERSON, LEE	383504	
5		KAGEN, J.	469254	
6		MAC ENTEE, RICH	102085	
7		BRIMMER, DON	1097	
8		WHITE, ROY	6300	

1996 USIC GOLDEN AGE SCALE

	PLACE	CONTESTANT	MODEL	FLT. 1	FLT. 2	FLT. 3	TOTAL
1	1	WECKERLY, STU	STOUT 2-AT	120	120	120	360
2	2	KOPTONAK, J.	FAIRCHILD RANGER	120	120	120	360
3	3	REES, DAVE	NICHOLAS BEASLEY	120	120	120	360
4	4	THOMPSON, MIKE	FARMAN F-450	120	120	120	360
5	5	PASSERELLI, BILL	P.A.M.A.	120	120	120	360
6	5	MCGILLIVRAY, JACK	CESSNA C-38	120	120	120	360
7	6	PEAVEY, LARRY	TAYLOR CUB	113	118	113	344
8	7	GRANT, JIM	REARWIN SPEEDSTER	84	58	90	232
9	8	CLEMENS, BOB	FARMAN MOUSTIQUE	60	57	54	171
10		MAC ENTEE, RICH					DNF
11		MARTIN, JOHN					DNF
12		MILLER, JIM	MARTIN MD-1				DNF
13		MOON, R.					DNF

1996 USIC COCONUT SCALE

	PLACE	CONTESTANT	AMA NO.	TIME	RANKING	SCALE PTS	TOTAL
1	1	REES, D.	33928	2.27	2	1	3
2	2	WECKERLY, S.	13250	2.28	1	3	4
3	3	LANDRUM, B.	52674	1.35	3	2	5
4	4	MAC ENTEE	12085	1.28	4	2	6
5	5	MARTIN, J.	712	1.16	5	2	7
6		KOPTONAK, J.	58027				DNF

1996 USIC PISTACHIO

	PL.	CONTESTANT	MODEL	SCALE	FLY 1	FLY 2	FLY PTS.	TOTAL PTS.
1	1	PAVEK, W.	VOISIN	1	1.31	1.33	1	2
2	2	RIPLEY, E.	WEEBEE	3	1.06	1.06	4	7
3		RIPLEY, E.	MO-1	7	0.02	0.04	11	18
4	3	MARTIN, J.	QUETZALCOATL	5	1.07	1.09	3	8
5		MARTIN, J.	WINDHAM	9	1.02	1.07	6	15
6		MARTIN, J.	GOLDWING	11	0.59	1.12	5	16
7	4	BRIMMER, D.	HI-MAX	2	0.45	0.3	9	11
8	5	MAC ENTEE, R.	FIKE	4	0.38	0.43	8	12
9	6	MILLER, R.	JENNY	10	1.34	1.24	2	12
10	7	REES, D.	LACEY	6	1.01	1.33	7	13
11	8	GILBERT, J.	FIKE	12	0.38	0.43	8	20
12	9	SCHLESINGER, W	COUGAR	11	0.23	0.25	10	21
13								
14								
15			W. BIGGE AND R. CLEMENS DID NOT FLY					

1996 USIC NO CAL

	PLACE	CONTESTANT	AMA NO.	1	2	3	4	5	BEST FLIGHT
1	1	LOUCKA, L.	1210	5.44	7.06	7.24			7.24
2	2	THOMAS, M.	MAAC1964	7.04	2.23	1.45	2.47		7.04
3	3	COSLICK, L.	4652	5.29	5.47	4.52	6.25	6.08	6.25
4	4	DIEBOLT, J.	97263	6.15	1.13	6.18	6.05	2.03	6.18
5	5	WARMAN, R.	18748	5.16	6.05	6.12	5.24	6.16	6.16
6	6	OBARSKI, R.	560	3.55	6.15	5.48	5.47	5.26	6.15
7		PAVEK, W.	319915	6.03	6.12				6.12
8		SEAVER, E.	397871	5.25	5.54	6.1	5.07	5.56	6.1
9		ROMASH, R.	130061	5.3	5.45	5.54			5.54
10		GANSER, J.	179424	4.42	4.54	4.56	5.05		5.05
11		PEAVEY, L.	365002	3.12	3.54	3.36	3.45		3.54
12		PERSON, L.	383504	3.04	3.17	3.52	3.25	3.51	3.52
13		BAIRD, D.	334655	3.07	2.03				3.07
14		KELLEY, J.	37564	2.4	0.04	0.51	1.1	1.48	2.4
15		STEVENS, H.	13086	1.54	2.17	1.24			2.17
16		BRIMMER, D.	1097	0.4	1.02	1.4	0.29	1.13	1.4
17		BOONE, J.	107857	1.24	1.19	1.29			1.29
18		KOPTONAK, J.	58027	1.03					1.03
19		NUSZER, J.	29036						DNF
20		HENDERSON, W.	1336L						DNF
21		GRANT, J.	159477						DNF
22		GILBERT, S.	1803						DNF
23		CLEMENS, R.	29634						DNF
24		CAMPBELL, D.	346641						DNF

AMA RECORDS

MINISTICK

Category	Time	Flier	Date	Design
I	9:23	Walt Van Gorder	4/11	Modified Krush
II	9:36	Andy Tagliafico	2/25	MiniQuark
IV	11:34	Walt Van Gorder	4/15	Modified Krush
IV	11:36	Bob Eberle	4/20	Original
II	9:58	Andy Tagliafico	2/25	MiniQuark
IV	12:33	Andy Tagliafico	5/11	MiniQuark
IV	14:03	Larry Coslick	5/19	Coslick Scooter
IV	12:32	Rob Eberle (SR)	5/27	Original

Catapult Glider - Standard Class

II	29.4+29.3	Kenny Krempetz*	4/02	Team Design**
II	50.5+50.6	Wayne Triven	4/20	Original
III	64.0+66.4	Bob Bienenstein	5/05	Original
III	64.3+63.7	Wayne Triven	5/18	Original

Catapult Glider - Unlimited Class

II	42.0+43.2	Kurt Krempetz	4/02	Original
II	50.7+51.3	Wayne Triven	4/20	Original
III	64.0+66.4	Bob Bienenstein	5/05	Original
III	68.6+69.5	Charles Primb	5/27	Original

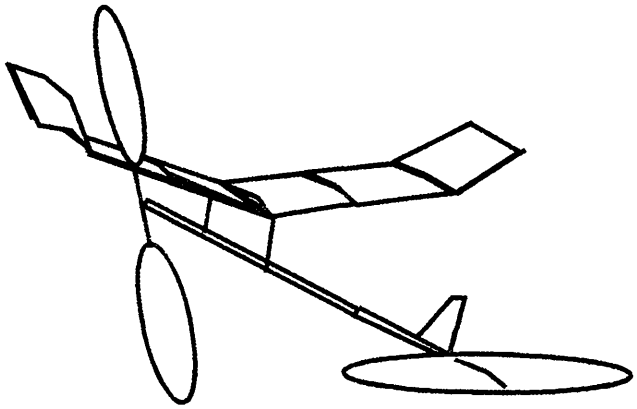
*Junior Entrant

** Father/Son team

Limited Pennyplane

I	16:14	Warren Williams	5/10	Original

JAPAN VS USA



1996 EASY B POSTAL

International Postal Contest
USA Rules Easy B Models
Three Man Teams
Dates - 1 August thru 31 October

For complete rules and entry form send stamped envelope to

Tom Vallee
444 Henryton So.
Laurel, MD 20724-2222 (301) 498-0790

Japan vs United States
1996 Easy B Postal Contest
ENTRY FORM

Model club or group_____ Date _____

Team Name(s) _____

Team Captain / Contact Man _____

Street Address _____

City, State - Zip _____

Phone _____

There is a nonrefundable $5.00 entry fee per team entered.

We are entering ____ teams. Total fees enclosed $_____

Team Captain Signature _____

Comments or questions_____

_____

_____

_____

_____

THE FINE PRINT - By signing this form you agree to conduct your leg of the Easy B Postal Contest By AMA Rules and special postal contest rules. You must fly your contest in a category I room (8 meter [26 foot] max ceiling height). All flights must be certified by an AMA Contest Director.

The purpose of this contest is to promote friendship and understanding between Japanese and American indoor modelers. Secondly it is meant to give **any Indoor flyer in country** willing to organize a team, a chance to fly in serious International Competition with some of the best flyers in the world. That's it. Have fun and good luck! **End-Fine Print.**

JAPAN Vs UNITED STATES
1996 EASY B POSTAL CONTEST

Site _____ Team _____ Date _____

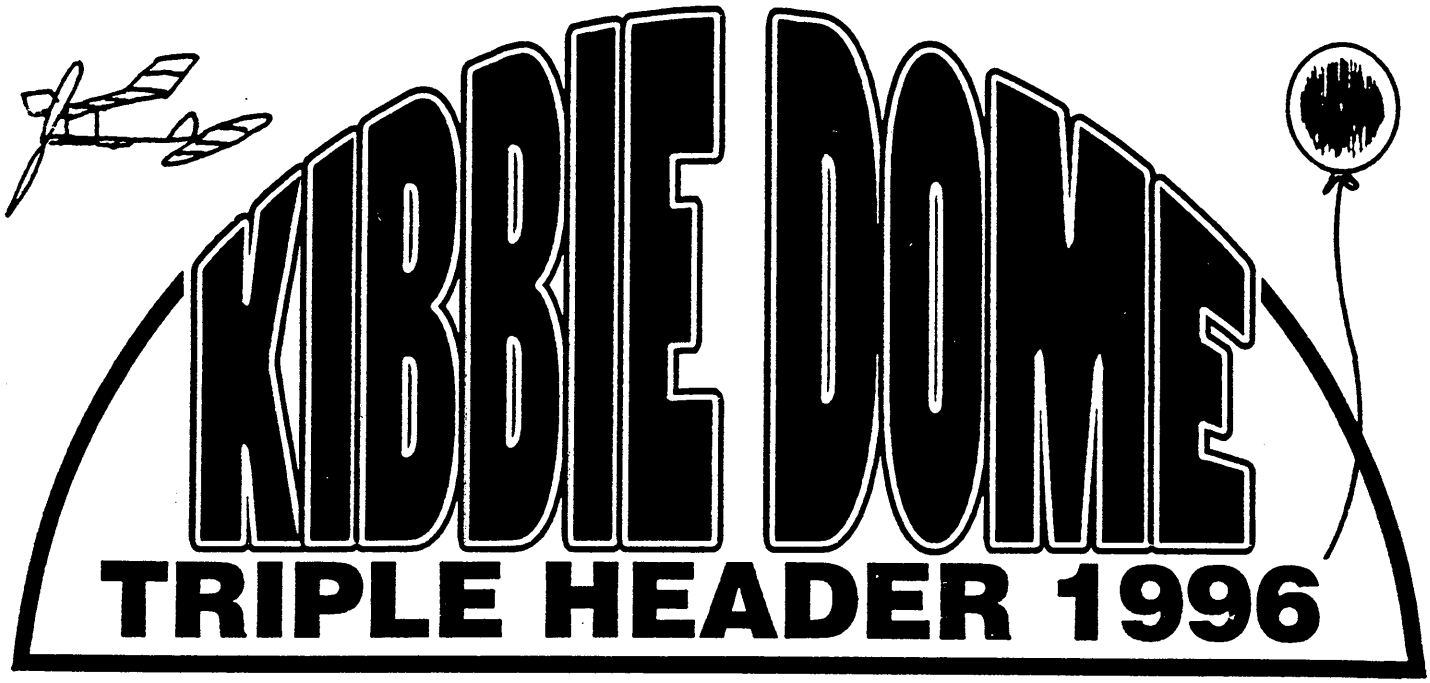
Ceiling _____

Contestant Name	1	2	3	4	5		Best	Rank
						TEAM TOTAL		

I certify contest flown correctly by rules

_____
Contest Director

Notes



ANNUAL-AUG. 1-3 • EASY B INTRNTL.-AUG.4 • INDOOR W.C.-AUG. 5-8

UNIVERSITY OF IDAHO, MOSCOW, IDAHO

MEET 1. (AUGUST 1,2,3) - **Kibbie Dome Annual.** All AMA Official Indoor Events.
Six official flights per event (which can be flown all three days - 8:00 A.M. to 8:00 P.M.
EXCEPTION : Hand Launch Glider and Catapult Glider flights 8:00 -9:30 A.M. only, daily.
SPECIAL EVENTS: Pro-20, Federation R.O.G.,Wingless Autogiro, P-24 & A-6 .
ENTRY FEE : Open & Senior- $45.00. Junior Flyers-$25.00. *There are no Event Charges.*
CONTEST DIRECTOR : Andrew Tagliafico, Call 503/452-0546 for additional information.
Modest Prizes will be given.
SCALE CONTEST DIRECTOR (for A.M.A. Scale and Peanut Scale events) is ED LAMB.
Phone 206/747-7806 for information. The static scale judging will take place prior to flying.

Modelers with cars must stop at University Visitor Information Center, 645 W. Pullman Road, (across from Hardee's Rest.) to obtain a visitor's parking permit. Cost is approximately $2.00

MEET 2. (AUGUST 4) - **The 1996 Wally Miller International Easy B Contest.**
Six rounds to be flown from 8:00 A.M. to 8:00 P.M. All A.M.A rules governing Easy B models to be observed. Timer volunteers are welcome.
ENTRY FEE: $35.00 for each flyer participating (Junior, Senior and Open combined)
CONTEST DIRECTORS: Wally Miller and Larry Coslick.

MEET 3. (AUGUST 5-8) - **Indoor F.1.D. World Championships.**
(AUG. 5) Arrival/Set up and Practice. (AUG.6) 7:00 A.M. to 9:00 P.M. Practice & Rnds. 1 & 2. (AUG. 7) 7:00 A.M. to 9:00 P.M. Practice & Rounds 3 & 4. (AUG. 8) 7:00 A.M. to 5:30 P.M.Practice & Rounds 5& 6. (AUG. 8) 7:30 P.M.- Banquet & Awards. World Championships Headquarters at Best Western University Inn, 1516 W. Pullman Road, Moscow, Idaho.
Meet Organizer/Patron: Andrew Tagliafico,10039 S. W. Quail Post Road, Portland OR 97219. 503/452-0546. *NOTE- Timer Volunteers are Needed.*
WORLD CHAMPIONSHIP CONTEST DIRECTOR: Bob Stalick

INAV

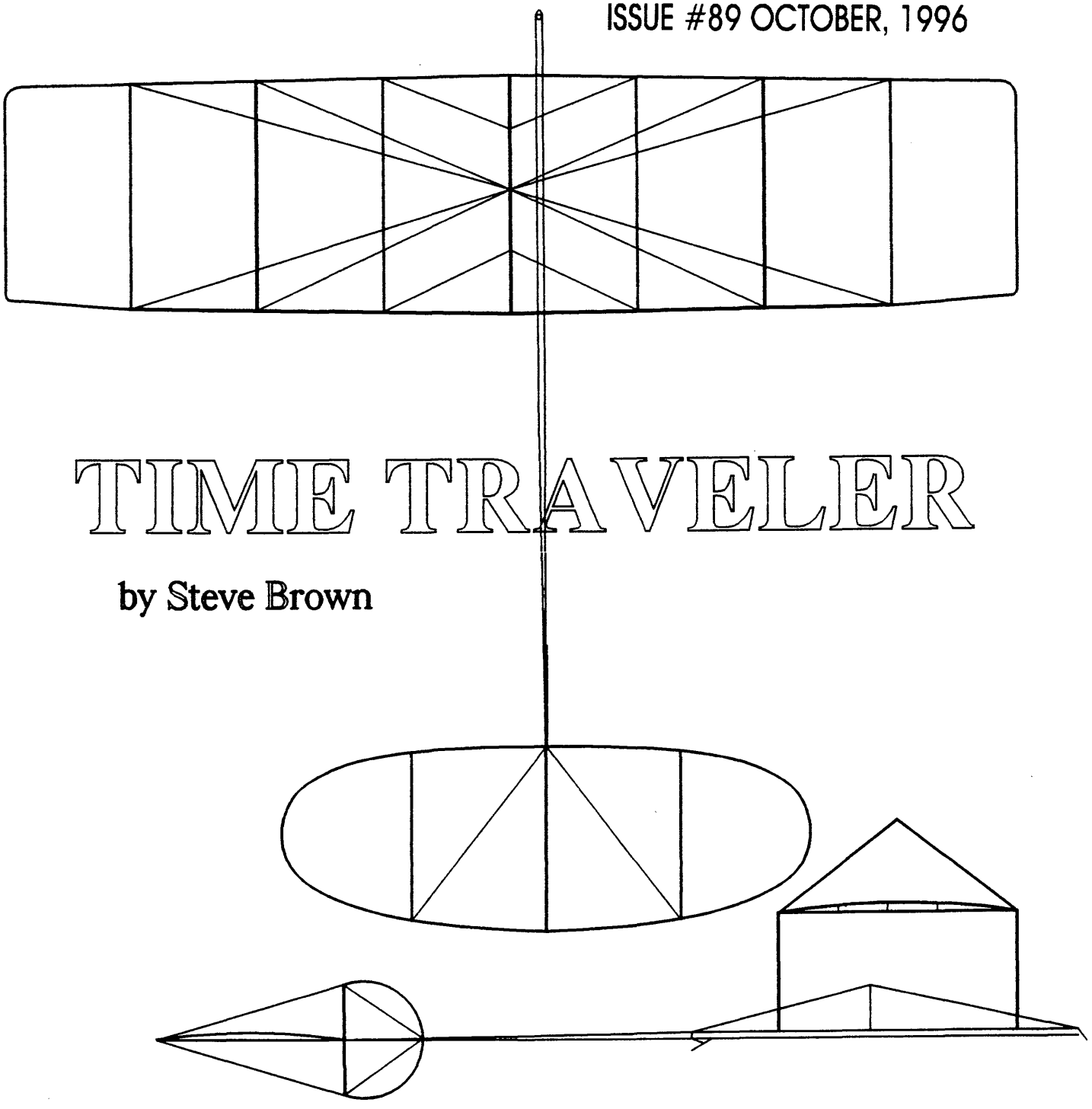
INDOOR NEWS AND VIEWS

ISSUE #89 OCTOBER, 1996

63:54!!!

TIME TRAVELER

by Steve Brown



INDOOR NEWS AND VIEWS (INAV) IS PRODUCED IN ST LOUIS BY ROY WHITE, LARRY COSLICK, HOWARD HENDERSON, BILL MARTIN, AND STEVE GARDNER

INAV DUES ARE:

U.S.	$9.00/year
Canada	$12.00/year
Other (air mail)	$15.00/year

4 (min) to 6 issues/year depending on budget and availability of material

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(INAV) can be reached via computer E-mail at the following addresses:
AEROBAT77@ AOL.COM (Steve Gardner)
H PIET H@AOL.COM (Howard Henderson)

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Next issue:

Beginner's construction article on Limited Pennyplane by John Barker

INDOOR AT ITS BEST

What is Steve Brown going to do next? At the F1D World championships in August, Steve won his second consecutive F1D title. Early this September Steve finished his 1st Unlimited Stick since 1985. On its 1st full motor flight at Sana-Ana Steve's model accomplished what indoor modelers have been trying to do for years, break the 60 minute mark. Steve broke the 60 minute barrier by an amazing margin with a flight of 63:54 and deadsticked from 30 feet. His account of this historic flight is on page 3

This is truly a great time to be involved in indoor free flight. We have good flying sites, great rubber, and the competition has never been better.

Gary Underwood has spent a considerable amount of time and effort to make Lakehurst available from early spring to late fall. Bill Hulbert has arranged to get Akron for three long weekends a year and this great Cat IV site usually has good air from mid-afternoon to early evening. On the west coast there is Santa-Ana, and a relatively new flying site, Tillamook, Oregon. The blimp hangar at Tillamook is an exact copy of Santa-Ana except that it doesn't have the windows along each side. The hanger is located a few miles from the Pacific ocean in a rural farming community. The site is quite impressive with the Coastal range mountains in the background. The weather is cool even in August and a jacket or sweater is needed while flying in the hanger. The air was good the 1st day we were there and Andrew Tagliafico set a new CatIV mini-Stick record of 14:28. Modelers in the Los Angeles area can now use Santa-Ana twice a month. There is no guarantee on how long these flying sites will be available, so take advantage of the opportunity to fly at these great hangers. At the end of this article there is a list of people to contact about flying at these sites. U.S. citizenship or security clearance might be needed for flyers living outside of the united states to fly at government installations.

Since Tan II was introduced in 1993 most of the **open** indoor records have been broken, some by substantial margins. This can be attributed to 8/93 Tan II, the standard by which we judge all new rubber. Fortunately most of the modelers were able to obtain some of this great rubber. Look at the results of the 1996 USIC, AMA Nationals at Johnson city. With good rubber and lighter EZB's flights of close to 30 minutes were posted, no touch. Intermediate stick times have gone from 29 minutes in 1992 to 38 minutes in 1996.

At the International EZB contest at Moscow, Idaho this year, combined EZB flights of 27 and 28 minutes would only achieve 4th place.

The EZB event is going through a sorting out process. How light does one have to build to be competitive? For ceiling heights of 90 feet and up it appears that a model weight of from .55 to .65 grams is the weight to shoot for. Flaring props have an advantage in most sites, but props that really flair are easy to overpower, killing the climb.

INAV will publish an article next issue on how to build and trim a very competitive EZB made entirely from hobby shop wood.

Laurie Barr from England is having a great year. He won the international EZB contest at Moscow Idaho and set a new world EZB record of 33:04 at Cardington.

Competition is the best ever, and relying on outdated models will not cut it today. There is always the exception, but the top modelers are continually trying to improve the performance of their designs. Individuals who put new ideas and design changes to work should be able to stay ahead of the game.

Individuals to contact about hanger flying

Lakehurst:	Akron:	Sana Ana:	Tillamook:
Gary Underwood	Bill Hulbert	Bob Randolph	Andrew Tagliafico
24 Kinnebec Ct.	174 Castle Blvd.	25145 Lauton Ave.	10039 SW Quail Post Rd.
Bordentown, NJ	Akron, OH	Loma Linda, CA	Portland, OR
08505	44313	92354	97219

The One Hour Flight

by Steve Brown

A sixty minute flight by a microfilm model has been an elusive goal for many years. Indoor modeling history is a progression of duration barriers. These barriers withstood the efforts of fliers only to finally fall as model development, or the advent of better rubber, allowed our models to fly longer. There was the 30 minute barrier, broken by Pete Andrews, the 40 minute barrier, probably also broken by Andrews, and the 50 minute barrier, broken by Kowalski in unlimited microfilm and Brown in 65 cm. F1d. Recently both Randolph and Richmond have come close to 60 minutes.

After the 1996 World Championships I planned to build a larger model to test the 60 minute barrier. Having had three 52 minute flights with F1d's, it seemed to me that a similar power/prop combination in tandem with much greater wing area was a possible solution. Increases in model size are not necessarily the answer, unless accompanied by less than proportional increases in model weight.

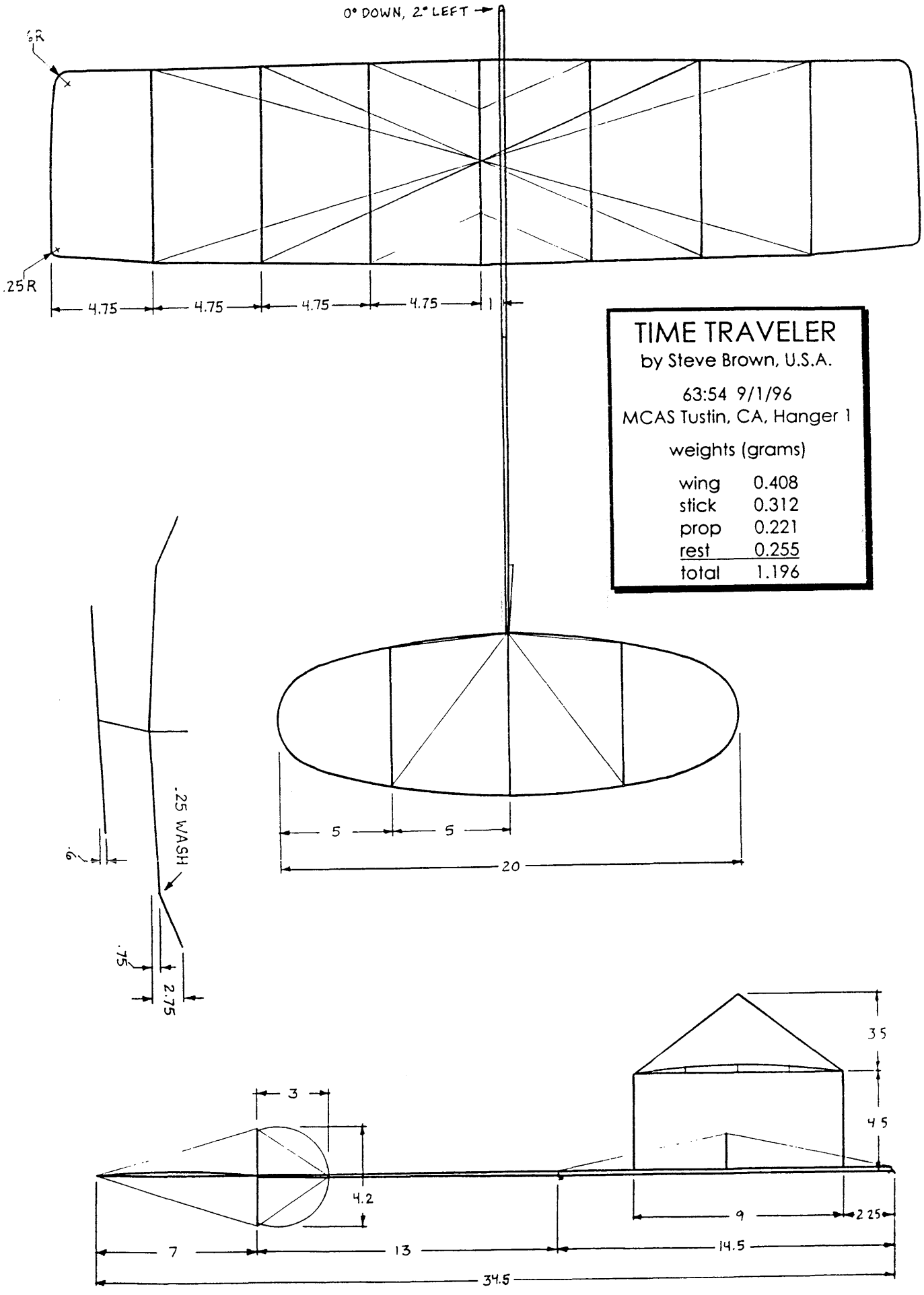
The model was completed two days before the Santa Ana flying session of September 1. A 320 sq. in. wing weighing .408 gm. was combined with a 35% stabilizer and a 14.5" F1d motorstick. Initially, I planned to try various F1d props with the goal of keeping the net flying weight low. The model, as flown, represented a 39% increase in wing area with a penalty of a 13% increase in model weight, compared to an F1d.

September 1 was warm, 85 degrees and humid at 55%. At Santa Ana, if outside winds don't cause excessive drift, this promised to be excellent flying weather. I expected to spend the day adjusting the new model and testing prop/power combinations. After three 1/4 motor flights to size the rubber, I was prepared to try 1/2 motors. The final 1/4 motor flight had been 15:11 at about 25' altitude. An enthusiastic Herman Andreason urged me to try a full motor. After breaking a couple of 1/2 motors I decided to follow his advice. The 1/4 motors had indicated that the model would go up to about 100'-110' and no outside winds were blowing at 12 noon. Air temperatures would be higher nearer the ceiling, probably resulting in a little more altitude, and the outside wind would increase later in the day causing more drift.

The model was launched at about 12:30pm with an 18" loop weighing 1.84 gm. turning a 21.5" VP prop. There were 2,480 turns at launch after a maximum wind to 2,530 turns. The model climbed rapidly to about 100' in its initial climb. After pausing at the 100' level and losing 8'-10' of altitude it began a second climb at around 25 minutes. The second climb lasted until 35-40 minutes and the airplane reached a maximum altitude of about 140'.

At about 45 minutes the model was cruising above the catwalks (137') and was drifting toward the side of the building. A short steer returned the model to the center, after which it began drifting to the opposite side. A second steer again returned the model to the center. The airplane began a slow descent at 48 minutes and finally ran out of turns at about 62 1/2 minutes and 35' of altitude. The motor stayed with the model and the final time was 63:54.

This flight was "unofficial" in that there were no record sanctions in place, although two timers timed the flight. The conditions contributed to this significant increase over the longest previous microfilm flight, 56:05 by Jim Richmond. I am confident, however, that the low wing loading produced by the model's weight of 1.196 gm., combined with a VP prop that allowed the use of all the turns in a long motor were the primary reasons this airplane was the first to fly more than an hour.



TIME TRAVELER

by Steve Brown, U.S.A.

63:54 9/1/96
MCAS Tustin, CA, Hanger 1

weights (grams)

wing	0.408
stick	0.312
prop	0.221
rest	0.255
total	1.196

Wing

spars, front		.034 X .043 6.0 lb.
spars, rear		.031 X .043 6.0 lb.
tips		.030 X .037 5.4 lb.
middle ribs		.028 X .043 5.2 lb.
compression ribs (2)	top:	.028 X .028 5.2 lb.
	bottom:	.035 X .026 5.2 lb.
	uprights:	.004 boron
wingposts		.035 X .053 4.9 lb.
		(3) .003 boron, full length
cabane		.035 X .044 → .030 X .035 5.4 lb.
bracing		.0003 tungsten
airfoil		3% ellipse, 1.5% ellipse at tips

Stabilizer

spars	.028 X .048 → .024 X .028 5.4 lb.
center rib	.028 X .044 5.4 lb.
outer ribs	.025 X .032 5.2 lb.
bracing	.0003 tungsten
airfoil	2% ellipse

Fin

vertical	.028 X .050 → .028 X .040 5.4 lb.
outline	.0004 boron

Motorstick

tube	.013 4.1 lb. (4) .0004 boron
webs	.018 4.2 lb.
cap	.013 4.1 lb.
bracing post	.048 X .048 → .035 X .035 X 1.9 7.0 lb
hook	.012 music wire
bearing	Harlan F1d, modified
bracing	(1) .001 tungsten

Boom

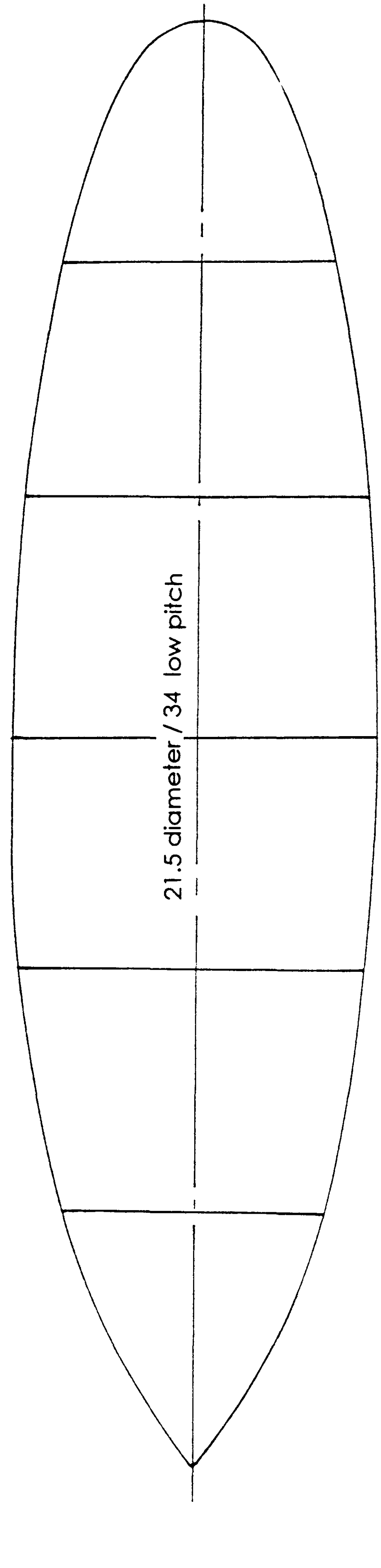
tube	.008 3.9 lb. .230 i.d. → .130 i.d.
	(2) .003 boron 6, 12 o'clock

Variable pitch propeller

spars	.068 X .075 → .030 X .030 5.5 lb.
center spar yoke	.068 X .040 → .068 X .100 5.5 lb.
	(2) .005 aluminum bearings
screw arm	basswood
screws	00-90 nylon
spar actuator arms	.007 music wire
yoke	.010 X .040 X .400 beryllium bronze
shaft	.013 music wire
outline	.024 X .024 4.5 lb.
ribs	.024 X .024 4.5 lb.
spring	.009 guitar string

Motor

August 1993 Tan II: .069 X .045 X 18.0 = 1.84 gm.
2530 initial turns - 50 backoff = 2480 launch turns, 0 left = 38.8 average RPM



1996 F.1.D. INDOOR WORLD CHAMPIONSHIPS
BY Jon Putnam

Steve Brown Becomes World Champ for Second Time
US Team takes first in Open and in Junior

Moscow, Idaho's 147 foot high Kibbie Dome was the site of this year's 1996 FID Indoor World Championships from August 5th. through 8th. Steve Brown took home the World Champion's trophy for a second time, repeating his win in Rumania. The team from the USA, consisting of Cezar Banks, Richard Doig, and Gary Underwood took first in the Open category. Jake Palmer of the USA took first in the Junior Division. Bob Randolph was the manager of both teams.

This may sound like an occasion for raising the broom handle to announce a clean sweep. And indeed it was. But it was a long and exciting contest, the leads changing places many times during the six rounds of often intense and exciting flying under the roof of one of America's greatest indoor sites.

The Opening Ceremonies saw teams from Rumania, Germany, Switzerland, Finland, France, the United Kingdom, Canada, the Ukraine, Hungary, and Japan introduced along with the US team. Teams from the Peoples Republic of China, Czechoslovakia, and Poland were scheduled to appear but visa and travel costs unfortunately eliminated their participation. The only Junior contestant was Jake Palmer from the USA, the same travel problems eliminating his competition. This is a shame as it would have meant for a really meaningful Junior F1D Championships. On the good side, a high point of the Opening Ceremonies was the introduction of the many F1D World Champions in attendance; Bud Romak (1976), Erv Rodemsky (1980) , Aurel Moraru (1982) and Steve Brown (1994). But enough on introductions and opening ceremonies. Let the games begin?

Round One opened up with some excellent flying by Jack McGillivray of Canada, Jack posting a first round high of 45:57. Close behind were Gary Underwood of the USA with a 42:31, Thomas Merkt of Germany with a 42:14, and Vasile Nicoara of Rumania with a 41:55. Pentti Nore of Finland and Mike Thomas rounded out the 40 minute club on the first round. This looked to be the start of a very hotly contested championship. With the flights of McGillivray and Thomas, Canada lead in the team scoring. Steve Brown, the Defending World Champion had his problems in the first round. His motor came off in midair, his model exploding after only 12:07 minutes.

The Second Round was really owned by Rene Butty, defending European Champion. All who took a look at his models and field box were really impressed by the fine craftsmanship. His flying showed the same sort of attention to detail with a second round high of 46:26, pushing up the ante by almost a minute. Gary Underwood was putting up a second very consistent flight with a time of 45:01. Close behind was Bernard Hunt with a 44:44, a terrific flight out of Bernard's un-braced F1D tandem design. Underwood's USA team-mate Cezar Banks put up a flight that brought the US team into first place for the first time. Everyone who witnessed the start of Cezar Banks' flight wondered if it was just a test hop or a flight gone bad as it never seemed to gain more than 50' of elevation. But the jokes ceased as 44:27 minutes later it was still in the air. Thomas Merkt with a 42:32, Vasile Nicoara at 43:59, Pentti Nore at 40:40, and Aurel Popa of Romania had a great second round, all bettering 40 minutes. Jake Palmer of the US Junior team was putting up very respectable 34:55 and 30:20 for his first and second rounds using airplanes without VP props.

The second round was not with out its heartaches as well. Steve Brown's problems continued with his motor breaking 37:19 minutes into what looked like a great flight in progress. Richard Doig had difficulty getting his Variable Diameter prop to function properly. But the hard luck king of round 2 was definitely Jack McGillivray. His first model blew up spectacularly on the flight line before launch. The second attempt at an attempt ended with a broken motor stick. A lot of folks were wishing Jack well as he launched for the third time, but this flight finally ended with a hung model after only 10:50 in the air.

The second day saw an improvement in the weather in the Dome. The cold winds of Tuesday that whipped down from the bleacher area of the Kibbie Dome were no longer apparent on Wednesday.
Cezar Banks had a tremendous flight of 48:47 followed close behind by a rejuvenated Steve Brown at 48:22, and an ever-so-consistent Rene Butty at 45:42. Nicoara, Merkt, Thomas and Nore also were above the 40 minute mark which now seemed about to be push down the Kibbie Dome's 50 minute wall. Once the 48+ minute flights got posted the consensus was that the tone of the whole meet changed. The tough were about to get going and by the sounds of buzzing winders Round 4 looked to be a humdinger indeed.

And it was. The air was great, full of late afternoon Kibbie Dome boomers that to the lucky few who snagged them added minutes to their times. Other intentionally or not rode the current of air generated by the Dome's giant floodlights, likewise increasing their times at some peril to their models. Cezar Banks again lead the contest with a really exceptional 49:50. Where did that other ten seconds go? Steve Brown and Rene Butty followed close behind at 49:18 and 48:01 respectively. Whispers in the crowd said, "Will Cezar finally do it?" fitting comments after his many times as runner up. Bernard Hunt, likewise, seemed to have reached his un-braced model's theoretical potential with a 45:38. Merkt, a very consistent flyer the entire contest was at 43:15 with team mate Lotz at 40:20. McGillivray and Thomas did over 40 minutes for Canada as did Mangalea and Nicoara of Rumania. Nicoara may get the meet trophy for most humorous flight as his model brushed ceiling tiles, danced through catwalks, arc lights and posts, often sliding many feet down only to climb back up again.

By the end of the second day's rounds some patterns had became apparent. Well functioning and tested VP props and great steering at high altitudes were the order of the day. Brown, Underwood, Hunt and Barr stand out in my mind as adding many minutes through adept steering. VP props meant that times of 40, 45 minutes that would have won a contest not long ago were the ante up in this one. In fact, a rumor, long circulated about the Kibbie Dome not being good 40 minute site had been thoroughly disproved. Out of the 202 flights made over three days at the World Champs, 54 flights had been over 40 minutes. In fact, a pair of 45 minute flights would only have gotten you fourth or fifth place. As the next two rounds were to show, flight times were not going to stop there.

Round Five was a runaway for the US contingent and a source of many problems for others Gary Underwood, back in form after a disappointing fourth round posted a 44:47. Banks at 44:28, all but wrapped up the team trophy for the US. But it was during Round Five that Defending World Champion Steve Brown finally got it all working, posting the meet's high time with a stunning 50:29 flight Only Cezar Banks and Rene Butty now were really within striking distance of Brown. But Butte's luck did not hold as he could only post a 30:15. The same consistent, over 40 minute group led by Merkt and Nicoara did well again in round 5 but others were less fortunate. With models wound to the limit, it became common for onlookers to wonder if they were witnessing an F1D or an F1C contest as these frail craft VTO'd skyward, snaring the Kibbie Dome's obstacles en route or colliding in mid air.

The last round saw a lot of fingers crossed for Cezar Banks. By adding 50 more seconds to his previous time, he could edge out Steve Brown and win. But, this was not to be. His 42:17 did not better his flight of the evening before. Brown elected not to fly, retaining his title in the process. Excellent flying by Banks, Underwood, and Doig had kept the team trophy in the USA. Jake Palmer, with non-VP models had come very close to 40 minutes, beginning what looks to be a great career in F1D. Second and third place in the team event was a closely fought contest as well, the UK team eventually beating Canada by a minute.

It is of some interest to compare the 1996 F.1.D World Champs to the 1994 World Champs in Slanic-Prahova. At Slanic-Prahova, Steve Brown's two best flights were 43:50 and 43:48, the winning total being 87:38. At Moscow, the winning total was 99:47, almost a 12 minute increase in total time. Total USA winning team score at Slanic-Prahova was 255:38. At Moscow, the winning team total was 270:40, almost a 15 minute increase over the previous WC. Lift in the site, better tuning of VP props may be accountable for this as the designs and rubber remained more or less constant.

Special mention needs to be made of event organizer Andrew Tagliafico, CD Bob Stalick and their staff of 55. Many contestants commented on the smooth operation of the contest, quick, accurate scoring and, a meet high point, catered food for contestants and staff.

So, where is it in 1998? Practice your Japanese. It may be in Nagoya.

jon_putnam@jf.ccm.intel.com

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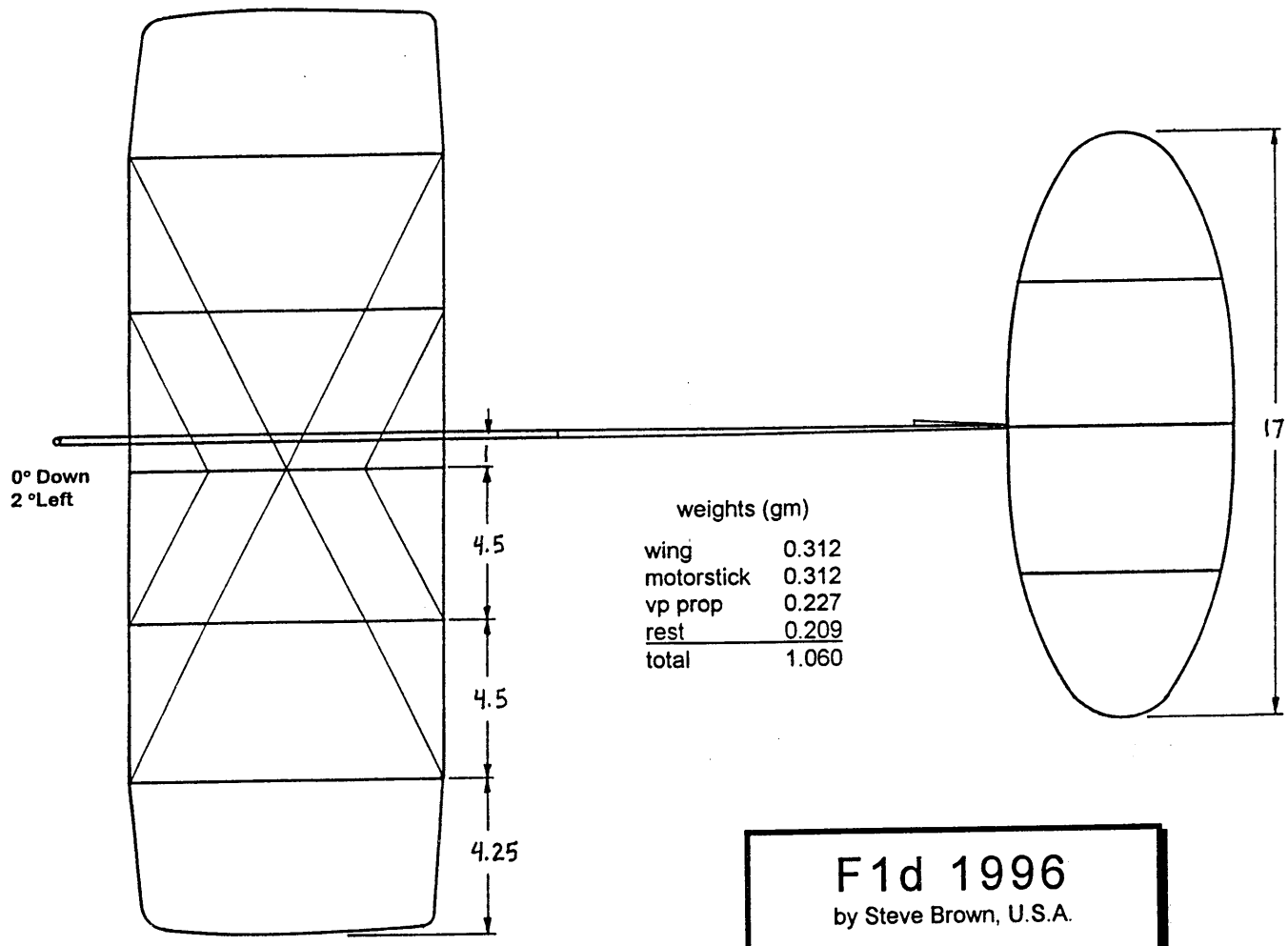
1996 Indoor WC - Individual

#	Name	Team	Cmp #	1	2	3	4	5	6	Best	2nd	Total
1	Steve Brown	DWC	100	12:07	37:19	48:22	49:18	50:29	00:00	50:29	49:18	99:47
2	Cezar Banks	USA	151	39:30	44:27	48:47	49:50	44:28	42:17	49:50	48:47	98:37
3	Rene Butty	SWI	139	35:00	46:26	45:42	48:01	30:15	43:48	48:01	46:26	94:27
4	Bernard Hunt	U.K.	141	36:09	44:44	34:24	45:38	39:47	45:22	45:38	45:22	91:00
5	Thomas Merkt	GER	119	42:14	42:32	44:36	43:15	44:33	45:27	45:27	44:36	90:03
6	Gary Underwood	USA	150	42:31	45:01	42:23	14:02	44:47	44:42	45:01	44:47	89:48
7	Vasile Nicoara	ROM	135	41:55	43:59	44:30	40:01	42:20	43:38	44:30	43:59	88:29
8	Jack McGillivray	CAN	101	45:57	10:50	32:59	41:40	17:19	23:03	45:57	41:40	87:37
9	Mike Thomas	CAN	102	40:56	27:55	41:17	43:01	42:12	42:53	43:01	42:53	85:54
10	Dezso Orsovai	HUN	122	35:07	33:49	36:32	19:23	43:02	42:38	43:02	42:38	85:40
11	Pentti Nore	FIN	113	40:37	40:40	42:52	33:11	41:14	30:19	42:52	41:14	84:06
12	Corneliu Mangalea	ROM	134	14:00	32:58	39:39	43:30	39:09	37:55	43:30	39:39	83:09
13	Laurie Barr	U.K.	140	34:52	39:11	41:04	14:31	40:18	41:13	41:13	41:04	82:17
14	Richard Doig	USA	149	38:37	31:15	26:43	33:23	41:26	40:49	41:26	40:49	82:15
15	John Tipper	U.K.	142	36:53	37:52	38:22	39:10	39:22	40:47	40:47	39:22	80:09
16	Rainer Lotz	GER	118	37:07	39:41	34:29	40:20	17:46	38:44	40:20	39:41	80:01
17	Vasili Moskalev	UKR	144	33:14	39:04	35:56	39:40	37:35	40:15	40:15	39:40	79:55
18	Edmund Liem	CAN	103	33:32	37:15	38:48	31:12	37:00	39:45	39:45	38:48	78:33
19	Lutz Schramm	GER	120	13:08	39:33	37:42	29:19	38:08	37:01	39:33	38:08	77:41
20	Aurel Popa	ROM	133	36:52	40:42	31:56	35:12	05:46	27:00	40:42	36:52	77:34
21	Ferenc Bakos	HUN	123	37:52	39:03	00:39	36:33	03:29	10:11	39:03	37:52	76:55
22	Hideyo Enomoto	JPN	125	36:39	39:01	30:33	37:39	19:56	18:52	39:01	37:39	76:40
23	Peter Keller	SWI	137	31:44	36:58	34:32	18:06	31:49	39:21	39:21	36:58	76:19
24	Yasutaka Tanaka	JPN	126	00:23	25:16	37:54	38:21	34:38	37:11	38:21	37:54	76:15
25	Andras Ree	HUN	121	31:20	35:09	38:01	36:35	26:59	00:00	38:01	36:35	74:36
26	Leif Englund	FIN	112	21:48	36:06	36:39	21:44	31:18	37:55	37:55	36:39	74:34
27	Robert Champion	FRA	116	18:41	30:41	34:11	35:00	36:19	36:19	36:19	36:19	72:38
28	Jake Palmer	USjr.	152	34:55	30:20	12:22	08:47	37:06	26:41	37:06	34:55	72:01
29	Shigeyoshi Nonaka	JPN	124	14:05	26:51	39:14	19:25	18:18	31:44	39:14	31:44	70:58
30	Gennadiy Iaschenko	UKR	143	35:05	35:21	31:07	15:03	35:05	24:25	35:21	35:05	70:26
31	Harro Erofejeff	FIN	114	29:42	34:02	34:05	31:49	09:24	34:26	34:26	34:05	68:31
32	Larisa Sidorenko	UKR	145	25:32	28:06	33:19	34:28	20:02	03:05	34:28	33:19	67:47
33	J. Francis Frugoli	FRA	117	26:08	20:53	29:45	15:34	32:44	19:34	32:44	29:45	62:29
34	Guy Cognet	FRA	115	30:16	20:37	26:18	27:56	28:55	29:40	30:16	29:40	59:56

1996 Indoor WC - Team

#	Total	Total
1	USA	270:40
2	U.K.	253:26
3	CAN	252:04
4	ROM	249:12
5	GER	247:45
6	HUN	237:11
7	FIN	227:11
8	JPN	223:53
9	UKR	218:08
10	FRA	195:03
11	SWI	170:46
12	DWC	99:47
13	USjr.	72:01



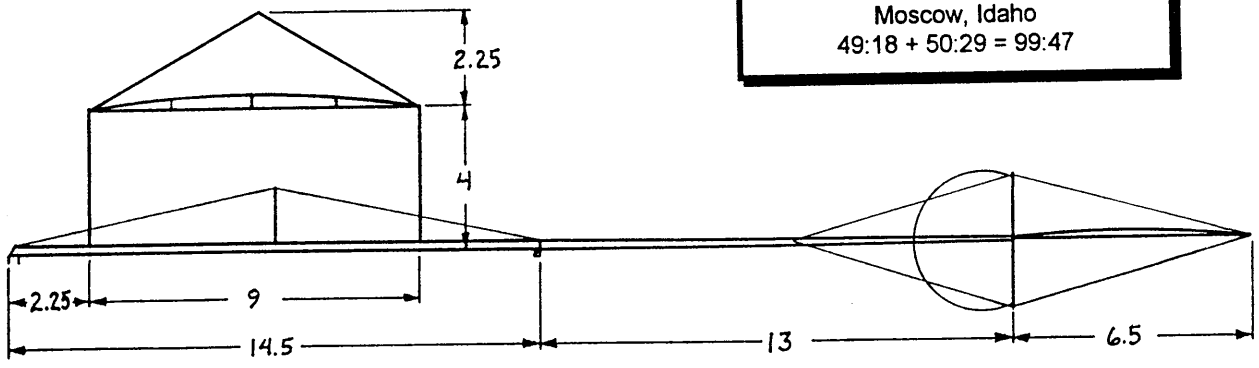
weights (gm)

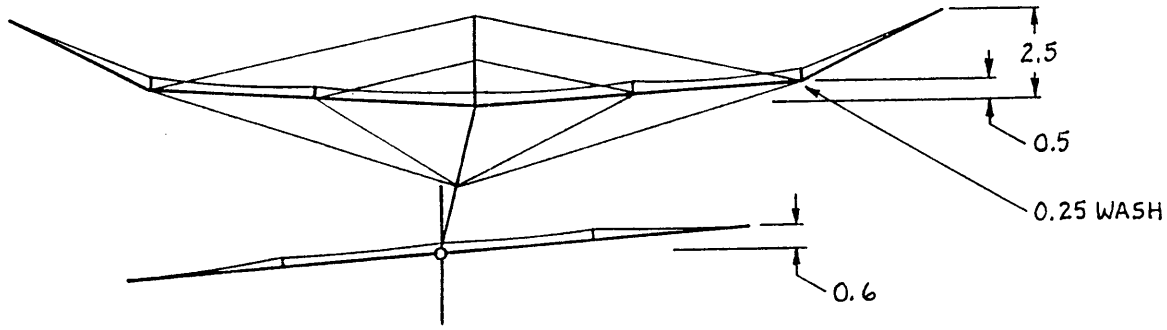
wing	0.312
motorstick	0.312
vp prop	0.227
rest	0.209
total	1.060

F1d 1996

by Steve Brown, U.S.A.

First Place
1996 Indoor World Championships
Moscow, Idaho
49:18 + 50:29 = 99:47





Wing

spars		.035 X .042 6.0 lb.
tips		.030 X .037 5.2 lb.
middle ribs (3)		.028 X .042 5.2 lb.
compression ribs (2)	top:	.028 X .028 5.2 lb.
	bottom:	.035 X .024 5.0 lb.
	uprights:	.004 boron
wingposts		.035 X .055 → .035 X .045 5.0 lb.
		.003 boron full length, (3) front, (2) rear
cabane		.030 X .045 → .030 X .035 5.2 lb.
bracing		.0003 tungsten

Stabilizer

spars	.028 X .048 → .024 X .032 5.4 lb.
center rib	.028 X .042 5.4 lb.
outer ribs	.025 X .032 5.2 lb.
bracing	.0003 tungsten to rear of center rib only

Fin

post	.028 X .050 → .028 X .040 5.6 lb.
outline	.0004 boron

Motorstick

tube	.013 4.1 lb. (4) .0004 boron 3,6,9,12 o'clock
webs	.024 4.3 lb.
cap	.013 4.1 lb.
bracing post	.045 X .045 → .035 X .035 X 1.75 6.8 lb.
hook	.013 music wire
bearing	Harlan F1d, modified
bracing	(1) .001 tungsten

Boom

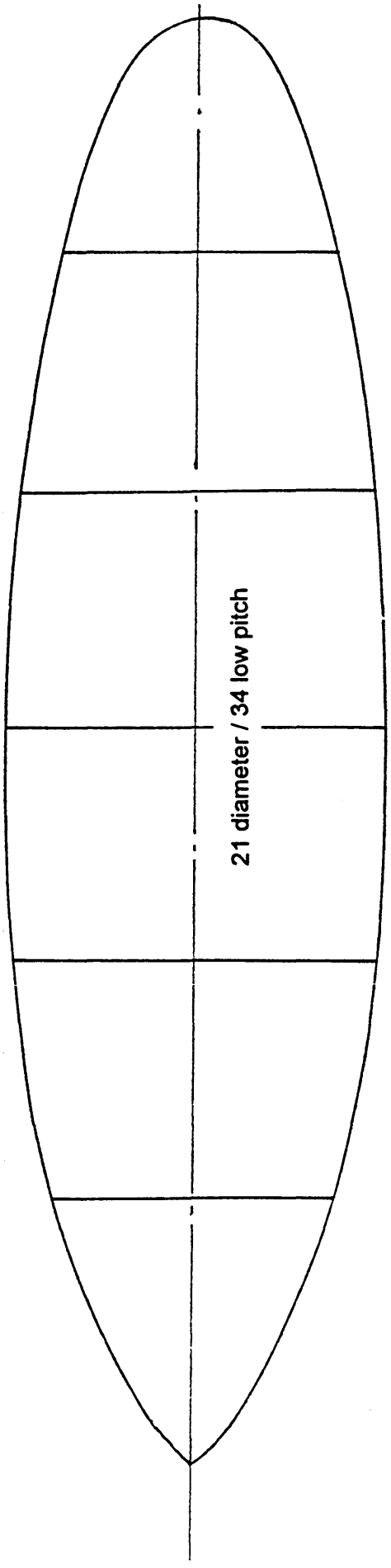
tube	.008 3.9 lb. .230 i.d. → .160 i.d.

Variable pitch propeller

spars	.068 X .075 → .030 X .030 5.5 lb.
center spar yoke	.068 X .040 → .068 X .100 5.5 lb.
	(2) .005 aluminum bearings
screw arm	basswood
screws	(2) 00-90 nylon
spar actuator arms	.007 music wire
yoke	.010 X .040 X .420 beryllium bronze
shaft	.013 music wire
spring	.009 guitar string
outline	.024 X .024 4.5 lb.
ribs	.024 X .024 4.5 lb.

Motor

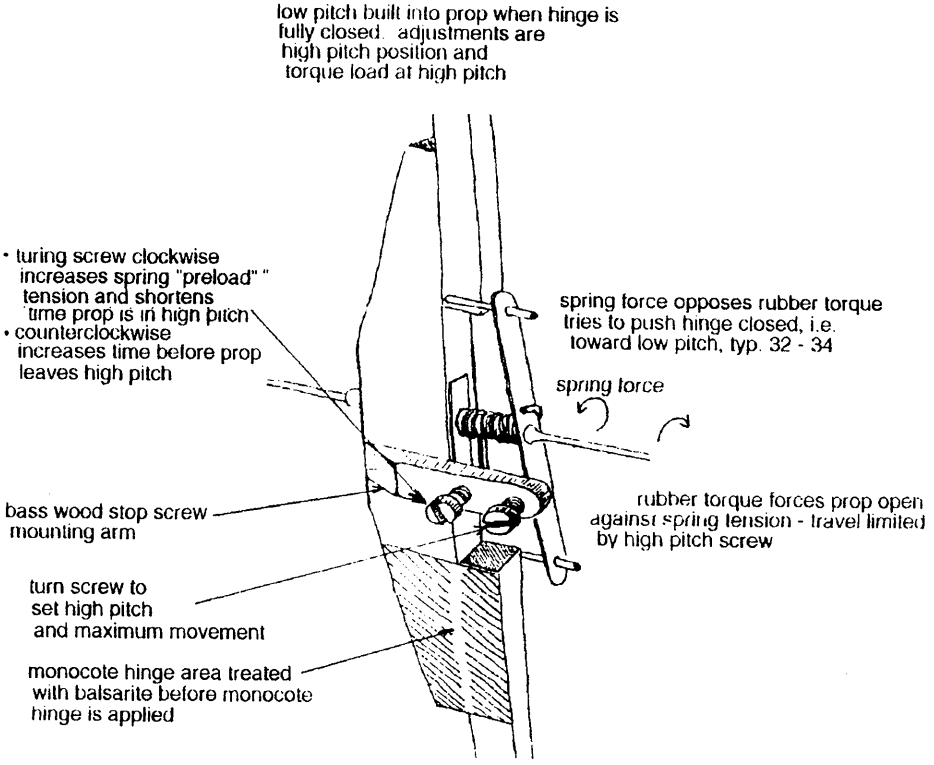
.046 X .069 X 16.5 = .058 oz., August 1993 Tan II
2310 launch turns, none remaining, 45.8 average RPM



CONSTRUCTION OF VARIABLE PITCH PROPS FOR INDOOR MODELS

Construction by Steve Brown
Illustrations by Steve Gardner

CURRENT F1d VP PROP CONSTRUCTION



Variable pitch propellers, or "VP" props. have become common place in F1d indoor flying. The performance improvement they offer is important to the competition flyer looking for really good times, and the modeler responsible for the prop detailed here can really talk about good times. His unlimited stick just did 63:54, braking the magic hour barrier in a big way.

Great care has been taken to retain the original information supplied by Steve Brown while getting his art and text into this format. Any mistakes are probably due to the transference and not to the original design.

1.

The first step is to make the hub, or center spar , to the dimensions given in fig 1.

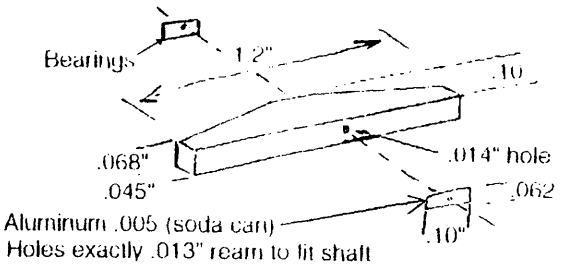


FIG.1

Don't omit the aluminum bearings . The holes should be just large enough for the prop shaft to rotate freely without any wobble. The bearings are attached with Ambroid or Duco cement.

2.

Make the prop shaft and yoke assembly next. The dimensions are given in FIG.2.

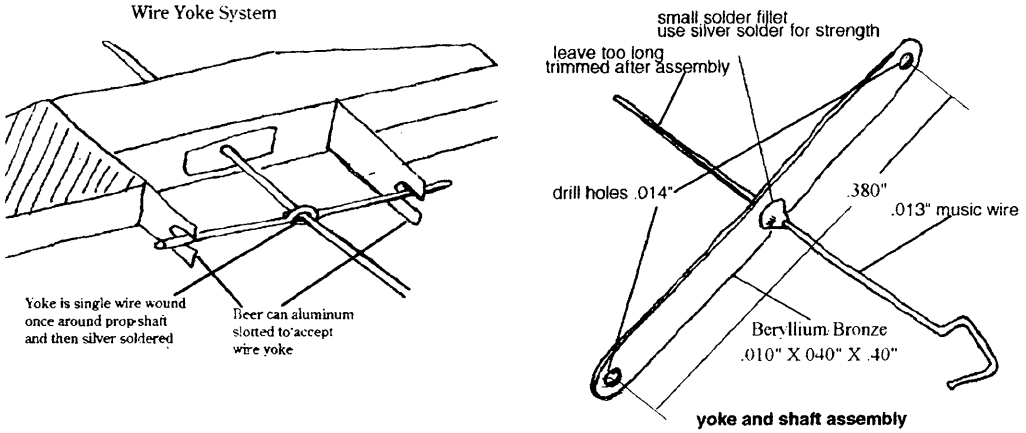


FIG. 2

Make certain that the solder joint is very strong. Use a silver solder such as sta-brite and build up a small fillet to reinforce the joint. Use a jig to insure proper alignment. After soldering place the assembly in warm, soapy water and scrub off all of the flux. Rinse thoroughly and inspect to make certain all the flux is gone. Flux will cause corrosion that will fail this important joint.

3.

Tack glue the prop spars to the hub using a jig block as shown in fig. 3. The jig is used to space the first spar then it is swung around to space the other spar the same distance from the shaft hole. The spars should be to finished dimensions and matched for flexibility before they are tacked to the hub.

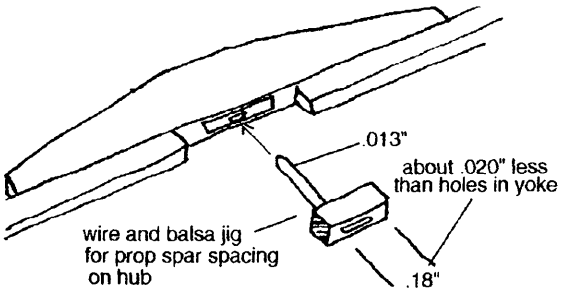


FIG.3

4.

Install monocote hinges. The area under the hinge is primed with balsa-rite from the Coverite company to insure a very good bond with the spar and hub. Jap tissue strips were originally used to

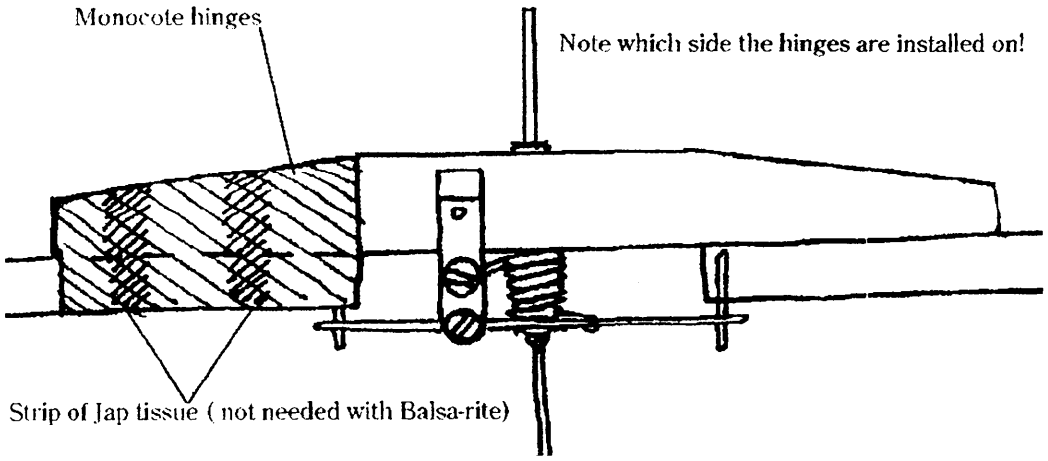
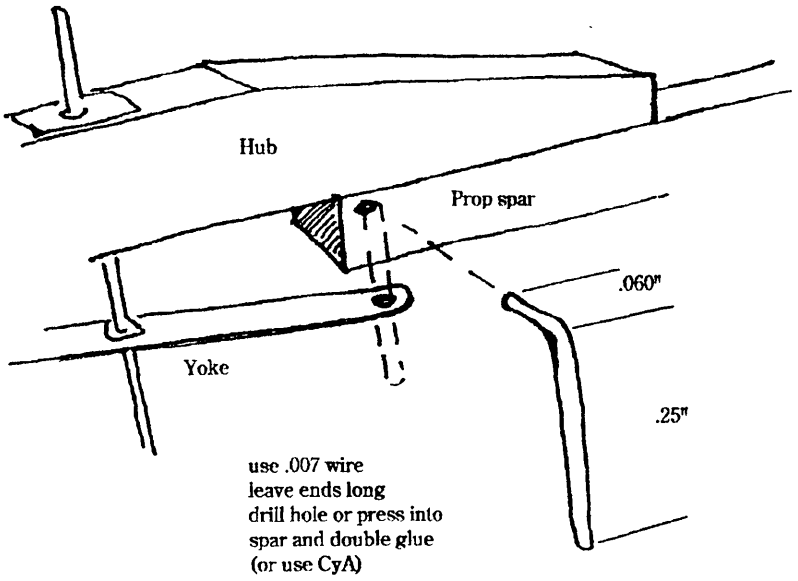


FIG. 4

5.

The actuator arms are added to the spars now. Use the shaft / yoke assembly to space the actuator arms. They go on opposite sides of the hinges as shown in fig. 5.



Actuator arm detail

FIG.5

6.

At this point the complete assembly is placed on the prop jig and the outlines are added. This is to avoid interfering with the adjuster screw arm that will be installed later.

7.

Make the adjuster arm from 3/32 X 3/32 model railroad basswood or the wood from a tongue depressor. The bass wood is both lighter and easier to work with.

Drill two holes .037" in diameter in the basswood stick a distance from the end that will preclude splitting. These holes should be the same distance apart as the length of the spring plus a .010" to slightly spread the spring when it is in place on the prop. These hole are now tapped with a 00-90 tap, reinforced with a drop of thin CyA glue, then tapped again to get clean strong threads for the stop screws. Make certain that the glue is hard and dry before tapping the holes the second time.

Once the holes are properly tapped the end of the arm is rounded off close to the hole so as to save weight. To prevent splitting add a bit more CyA to the end of the arm where it has been rounded, then trim the thickness down to .055" and cut the notch .020" deep as shown in FIG.6.

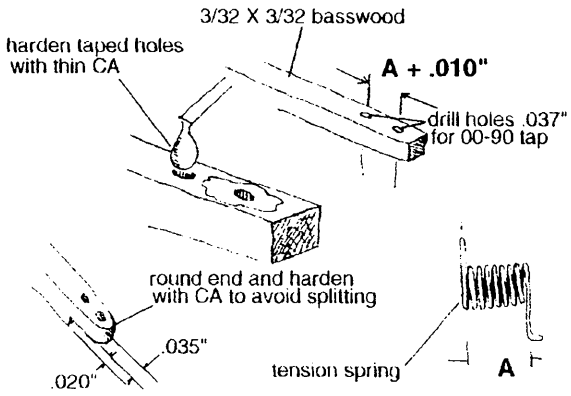


FIG.6

once the actuator arm is shaped it is placed against the hub to determine the proper length and then it is cut to size. assemble the shaft /yoke and spring onto the hub and arrange everything in the proper position, then add the adjuster arm using titebond. Once this is dry drill a .025" hole and add a hard balsa peg through the arm and the hub to strengthen this joint. See FIG. 7

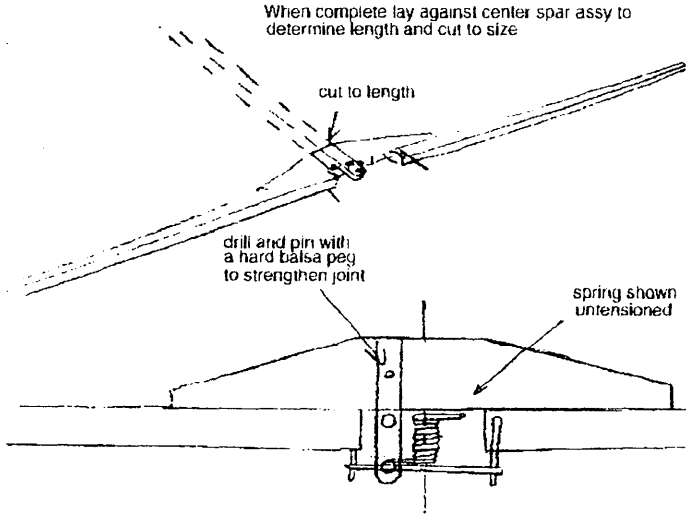


FIG.7

8.

Now remove the shaft /yoke assembly and carefully soak the tack glued spars loose so that the hinges can operate. Be very careful not to soften any other glue joints and let things dry for 4-6 hours.

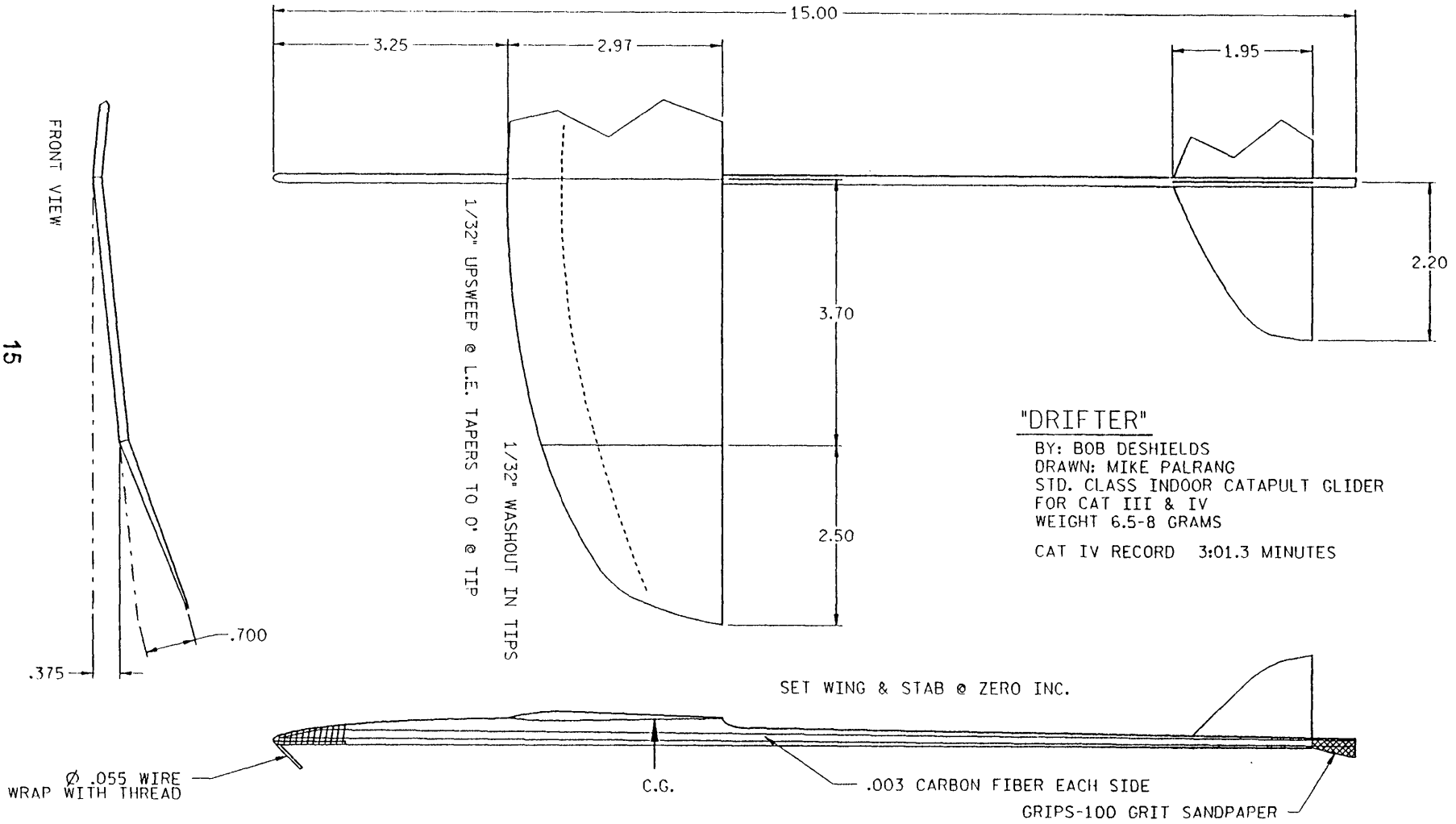
9.

Drill a .037" hole in a piece of Plexiglas or metal about 1/16 or so thick and tap to 00-90. Screw a 00-90 nylon screw through until it is just sticking out of the back side of the piece. The idea is to slice and

WOOD

WING	4.0 #	1/8 THK. C-GRAIN
FUSE	6-8 #	1/8 X 7/16 A-GRAIN
STAB	4.0 #	1/32 THK. C-GRAIN (SAND THIN)
RUDDER	4.0 #	.025 THK. C-GRAIN

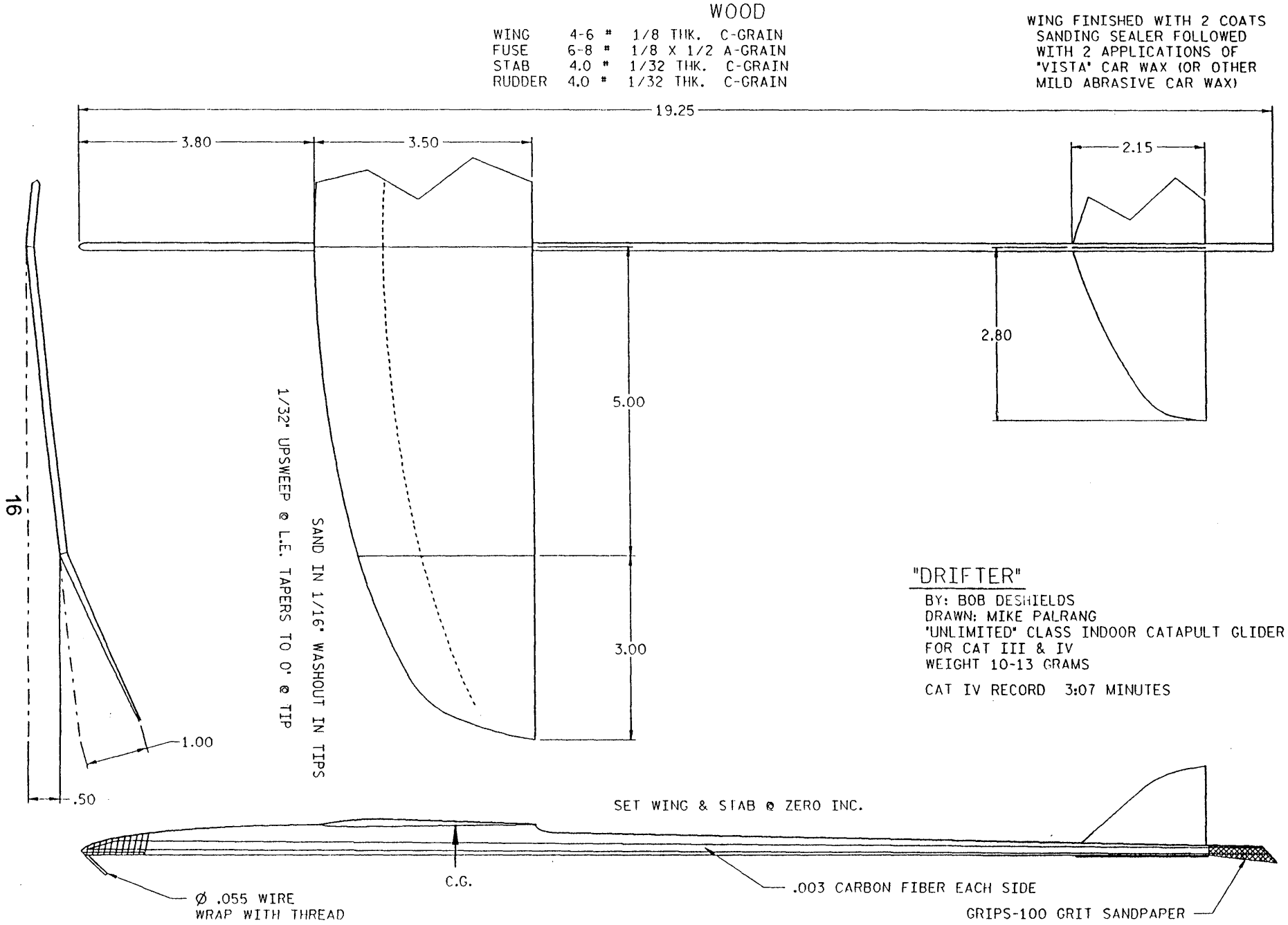
WING FINISHED WITH 2 COATS SANDING SEALER FOLLOWED WITH 2 APPLICATIONS OF "VISTA" CAR WAX (OR OTHER MILD ABRASIVE CAR WAX)



"DRIFTER"

BY: BOB DESHIELDS
DRAWN: MIKE PALRANG
STD. CLASS INDOOR CATAPULT GLIDER
FOR CAT III & IV
WEIGHT 6.5-8 GRAMS

CAT IV RECORD 3:01.3 MINUTES


WOOD
WING 4-6 # 1/8 THK. C-GRAIN
FUSE 6-8 # 1/8 X 1/2 A-GRAIN
STAB 4.0 # 1/32 THK. C-GRAIN
RUDDER 4.0 # 1/32 THK. C-GRAIN
WING FINISHED WITH 2 COATS SANDING SEALER FOLLOWED WITH 2 APPLICATIONS OF "VISTA" CAR WAX (OR OTHER MILD ABRASIVE CAR WAX)
19.25
3.80
3.50
2.15
2.80
5.00
3.00
1.00
.50
1/32" UPSWEEP @ L.E. TAPERS TO 0" @ TIP
SAND IN 1/16" WASHOUT IN TIPS
"DRIFTER"
BY: BOB DESHIELDS
DRAWN: MIKE PALRANG
"UNLIMITED" CLASS INDOOR CATAPULT GLIDER
FOR CAT III & IV
WEIGHT 10-13 GRAMS
CAT IV RECORD 3:07 MINUTES
SET WING & STAB @ ZERO INC.
C.G.
Ø .055 WIRE WRAP WITH THREAD
.003 CARBON FIBER EACH SIDE
GRIPS-100 GRIT SANDPAPER

sand off the conical point of the screw so that the end of the screw is nice and flat. Repeat for the second screw, but after you have flattened the end drill a .010" hole into the end of the screw while it is still in place. Use good magnification to insure that the hole is in the center of the end of the screw. Enlarge the hole to .020" about .032" deep and nice and clean as shown in FIG. 8.

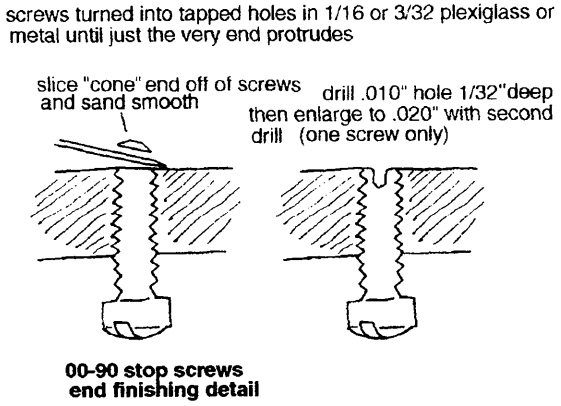
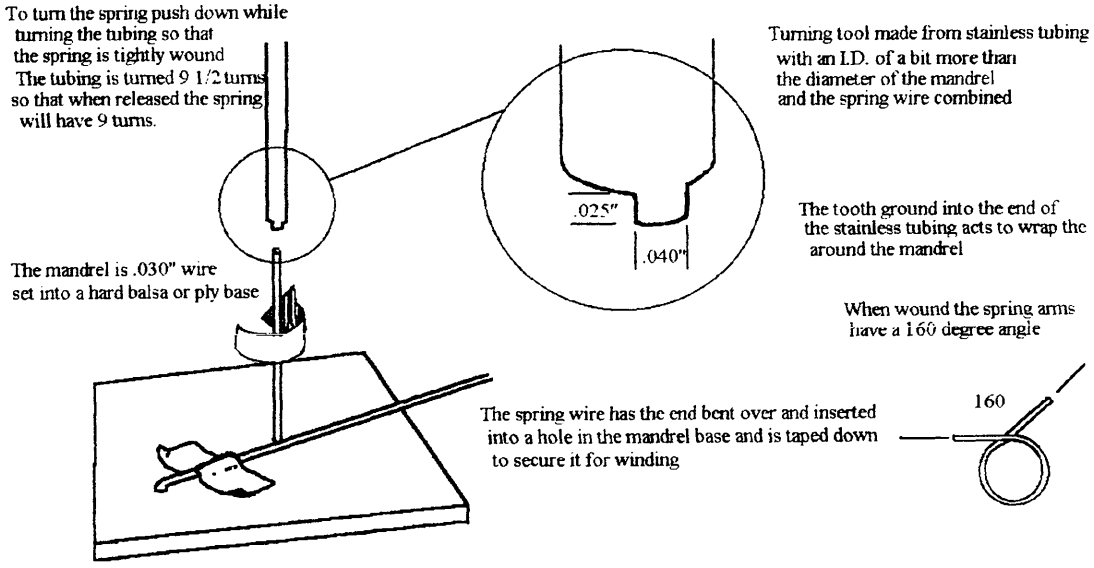


FIG.8

10.

Wind the spring around a .030" mandrel using a driver made from a piece of stainless steel tubing with a .040" wide by .025" tall tooth ground into the end of it. The I.D. of the tubing should be a bit more than the O.D. of the mandrel and the spring wire combined. The spring is wound 9 1/2 turns so that it relaxes to about 9 turns total with an angle of 160 degrees between the arms. See FIG.9.



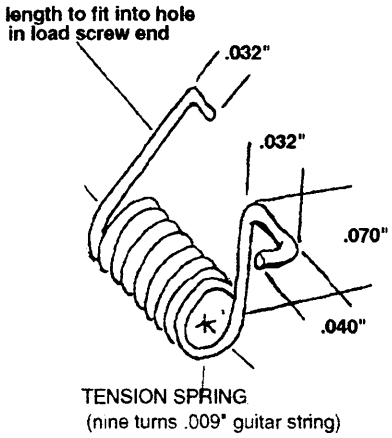


FIG.9A

11.

Carefully assemble the prop in the following manner. Add a piece of .035" O.D. X .013" I.D. Teflon tubing to the shaft to center the spring around the shaft and prevent binding. This tubing will ride inside the spring so it has to be shorter than the spring a by a bit. Add the stop screws with the drilled one in the front hole nearest the hub. place the spring onto the shaft and push the whole assembly together until you can get the front end of the spring into the hole in the screw. At the same time hook the rear arm of the spring onto the yoke and twist, opening the spring and sliding the yoke onto the actuation arms of each prop spar. You may need needle nosed pliers to walk the front arm of the spring into the hole in the front screw.

When it is all together the mechanism will be under tension with the spring holding the prop closed, (the hinges fully shut and the prop in low pitch). Add a small Teflon washer or a .030" long bit of Teflon tubing to the shaft to retain the hub. This washer should be a very snug fit and it is further retained by gluing with ambroid to just the shaft in front of the washer. the shaft and actuating arms are now trimmed to length. See FIG.10

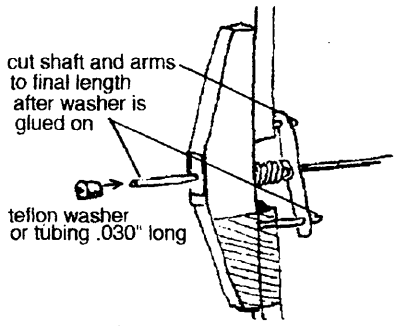


FIG.10

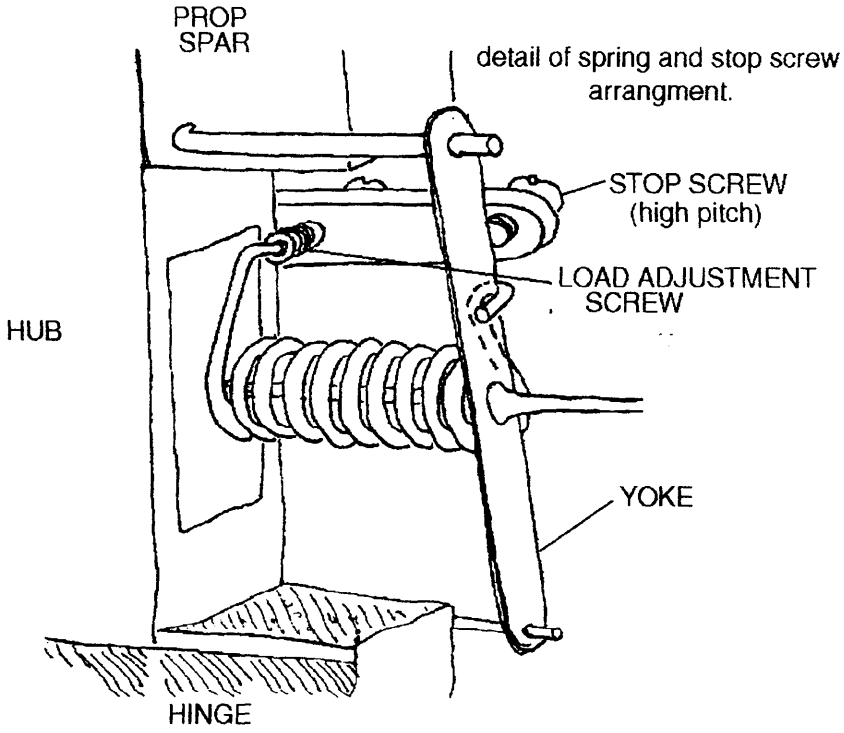
12.

To adjust the propeller for flight start with the front screw , the one with the hole in it. Screw this in about half way to start with. Steve Brown made a small torque meter to help set the pretension to where the prop blades just start to open (viewing the hingline under magnification) at about .14 -.17 in/oz of torque. **This is just a starting point and will most probably need to be adjusted further.**

Screw the rear screw (high pitch limit screw) about 2/3 to 3/4 the way in to start with a fairly low setting for the highest pitch. Install prop and test fly the model. First use the rear screw to set the high pitch -high torque setting to get the altitude needed, then use the front screw to set the tension and so vary the point when the prop starts to switch over to lower pitch. In some cases you will have to take the prop apart to adjust the spring tension by "tweaking" the spring if you run out of travel on the front screw adjustment.

WARNING!

Watch the shaft/yoke solder joint! When it starts to fail (and it will!)the shaft will start to rotate slightly in relation to the yoke . this will cause the prop to tend to remain in high pitch too long and so spoil the flight. this is a sign that the joint is failing. If a prop that flew fine suddenly needs the high pitch reduced a great deal, and the adjustment has little effect, check to see if this joint has shifted and so is about to fail. Stop flying and repair immediately!



KIBBIE DOME ANNUAL RESULTS

STANDARD CATAPULT GLIDER

NAME	1	2	3	4	5	6	7	8	9	TOTAL	PLACE
BOB DE SHIELDS	1:18	1:19	1:23	1:25	1:26	1:27	1:27	1:29	1:32.3	3:01.3	1
MIKE THOMPSON	1:24	1:22	1:26	1:24	1:28	1:27	1:28.9			2:56.9	2
WALLY MILLER	1:13	1:11.4								2:24.4	3
ED BERRAY	:49	:55	:51.5	:54.2	:55.9	:56.7	:58			1:56.7	4
JOHN LENDERMAN	:53.4	:55.4	:58	:47.9						1:53.7	5
HERB ROBBINS	:50	:52								1:42	6
MIKE PALRANG	:51	:53									
FRANK HERLEMAN											
BOB WARMANN											
BOB ROVICK											

UNLIMITED CATAPULT

NAME	1	2	3	4	5	6	7	8	9	TOTAL	PLACE
BOB DE SHIELDS	1:05.5	1:03.2	1:08.5	1:04.7	1:06.5	1:13.4				2:21.9	1
MIKE THOMPSON	1:01	1:05.4	1:02.3	1:06						2:11.4	2
DARRYL STEVENS	:55	:33	:47	:45	:59	1:02	1:06	:59	:42	2:08	3
JOHN BUSKELL	:56	:58	:59	1:02	:51	:54	:57	:56		2:01	4
ROB EBERLE	:57	:59	:58	:58	:56					1:57	5
BOB ROVICK											
FRANK HIRLEMAN											

EZB RESULTS

NAME	1	2	3	4	5	6	7	8	9	TOTAL	PLACE
LARRY CAILLIAN	27:26									27:26	1
LARRY COSLICK	25:20	26:52								26:52	2
BERNARD HUNT	26:33									26:33	3
MIKE PALRANG	24:32	25:32	25:59.3							25:59.3	4
BOB DE SHIELDS	22:39	24:55	24:37	25:09						25:09	5
TIM TAYLOR	24:14									24:14	6
JOHN LENDERMAN	21:58	22:01	21:40							22:01	7

EZB RESULTS

LEW GITLOW	21:45	20:43								21:45	8
GENE JOSHU	21:01	21:06								21:06	9
ED BARRAY	20:56	20:12								20:56	10
CHARLES DORSETT	18:41	1:35	19:50	16:32	19:44					19:50	11
HERB ROBBINS	18:25	19:01	19:14	19:24						19:24	12
WARREN WILLIAMS	19:23									19:23	13
BUD TENNY	14:26	14:47	17:40							17:40	14
EARL HOFFMAN	17:41	22:44									
DARRYL STEVENS											
ANDY TAGLIAFICO											
PETE SAMUELSEN											
BOB ROVICK											
WALT VAN GORDER											

LIMITED PENNY PLANE

NAME	1	2	3	4	5	6	7	8	9	TOTAL	PLACE
JOHN LENDERMAN	13:24	14:29	15:09.5	15:20.4						15:20.4	1
WALT VAN GORDER	15:12									15:12	2
BOB WARMANN	12:59	12:07	12:32	14:15	15:01.4					15:01.4	3
JIM CLEM	12:41	13:21	13:55	14:28						14:28	4
JOHN MARETT	13:47	11:09	11:12							13:47	5
BRUCE KIMBALL	12:36	12:08	13:45							13:45	6
LEW GITLOW	11:03	12:30	12:46							12:46	7
MIKE PALRANG	12:18									12:18	8
EARL HOFFMAN	11:42									11:42	9
BOB ROVICK	9:04	9:24	9:46	10:20	11:35					11:35	10
VERN HACKER	7:56	8:51	10:15	10:17						10:17	13 (TIE)
PETE SAMUELSEN	10:17	10:17								10:17	13
WARREN WILLIAMS	11:18	12:??								11:18	11
SHER GILLESPIE	10:51									10:51	12
BOB SHCAEFER	8:54	8:59	9:17	9:26	9:03	9:38				9:38	14

LIMITED PENNY PLANE

BUD TENNY	7:20	8:45								8:45	15
DARRYL STEVENS											

PENNY PLANE

NAME	1	2	3	4	5	6	7	8	9	TOTAL	PLACE
JIM CLEM	14:17	15:57	16:16							16:16	1
JOHN LENDERMAN	16:03									16:03	2
JOHN MARETT	10:50	13:30	8:00							13:30	3
BOB WARMANN	12:44									12:44	4
BOB ROVICK	10:39	12:04								12:04	5
BUD TENNY	7:38	11:19								11:19	6
ROB EBERLE											

MINI STICK

NAME	1	2	3	4	5	6	7	8	9	TOTAL	PLACE
LARRY CAILLIAU	12:47									12:47	1
WALLY MILLER	11:25	12:43	12:21							12:43	2
LAURIE BARR	10:38	12:28								12:28	3
MIKE PALRANG	12:06									12:06	4
WALT VAN GORDER	11:50									11:50	5
ED BARRY	10:54.2	10:15								10:54.2	6
PETE SAMUELSEN	6:29	9:07	10:10	9:28	10:15	10:51				10:51	7
ROB EBERLE	10:43									10:43	8
JOHN LENDERMAN	10:32									10:32	9
EARL HOFFMAN	6:48	8:42	7:04	8:57						8:57	10
ANDY TAGLIAFICO											
BOB ROVICK											
WARREN WILLIAMS											

INTERMEDIATE STICK

NAME	1	2	3	4	5	6	7	8	9	TOTAL	PLACE
LARRY COSLICK	30:47	38:33								38:33	1
LAURIE BARR	30:04	31:21								31:21	2
EARL HOFFMAN	27:12	28:28								28:28	3

INTERMEDIATE STICK

PETE SAMUELSEN	24:17	24:08	25:27							25:27	4
MIKE THOMPSON	21:22	24:37								24:37	5
BOB DE SHIELDS	23:47	22:17								23:47	6
NICK LEONARD SR.	12:45	14:02	18:25	20:29	20:04	15:33				20:29	7
JOHN MARETT	19:05									19:05	8
WARREN WILLIAMS											

PRO 20

NAME	1	2	3	4	5	6	7	8	9	TOTAL	PLACE
BOB DE SHIELDS	27:58	29:51								29:51	1
LARRY COSLICK	22:07	28:25	28:30	28:40						28:40	2
ANDY TAGLIAFICO	24:56	26:36	27:20							27:20	3
EARL HOFFMAN	24:00	25:51								25:51	4
WALLY MILLER	19:57	21:41	25:03							25:03	5
WARREN WILLIAMS	22:11									22:1	6
PETE SAMUELSEN	21:12									21:12	7
MIKE THOMPSON	21:09	21:56								21:56	8
BOB ROVICK											

ORNITHOPTER

NAME	1	2	3	4	5	6	7	8	9	TOTAL	PLACE
WARREN WILLIAMS	10:12									10:12	1
MIKE PALRANG	9:01	9:52								9:52	2
KEN JOHNSON	7;38	9:16	9:48	8:04	8:55					9:48	3
ANITA TAYLOR	3:29	5:25	6:11	6:58	7:21					7:21	4
HERB ROBBINS											

BOSTONIAN

NAME	1	2	3	4	5	6	7	8	9	TOTAL	PLACE
MIKE PALRANG	4:23	4:26	4:31							4:31	1
SHERM GILLESPIE	1:37	2:27	2:19							2:27	2
BOB SCHAEFER	1:39	1:45	1:36							1:39	3
DAVE HAUGHT	1:05	1:18	1:24							1:24	4
GUY RUSSO											

P-24

NAME	1	2	3	4	5	6	7	8	9	TOTAL	PLACE
KURT SCHULER	4:50	6:01	6:29.6	6:49.4						6:49.4	1
LEW GITLOW	5:10	5:10	5:16							5:16	2
AL LIES	3:36									3:36	3
ANDY TAGLIAFICO											

HELICOPTER

NAME	1	2	3	4	5	6	7	8	9	TOTAL	PLACE
LARRY COSLICK	12:00									12:00	1
NICK LEONARD JR.	4:40	5:47								5:47	2
NICK LEONARD SR.	3:55	4:24	3:19							4:24	3

A-ROG

NAME	1	2	3	4	5	6	7	8	9	TOTAL	PLACE
BOB DE SHIELDS	12:21									12:21	1
WARREN WILLIAMS	8:57.6									8:57.6	2
NICK LEONARD JR.											

ROG CABIN

NAME	1	2	3	4	5	6	7	8	9	TOTAL	PLACE
NICK LEONARD SR.	8:36	10:27								10:27	1
NICK LEONARD JR.											

35 CENTIMETERS

NAME	1	2	3	4	5	6	7	8	9	TOTAL	PLACE
JESSE SHEPHERD	10:39	17:23	19:58							19:58	1
WARREN WILLIAMS	10:00									10:00	2

A-6

NAME	1	2	3	4	5	6	7	8	9	TOTAL	PLACE
LEW GITLOW	3:42	4:06	4:41							4:41	1
FRANK HIRLEMAN	2:05	3:10	2:35.4							3:10	2

MANHATTEN

NAME	1	2	3	4	5	6	7	8	9	TOTAL	PLACE
JOHN MARETT	11:59	12:55	12:02							12:55	1
WALT VAN GORDER	11:39									11:39	2

UNLIMITED STICK

NAME	1	2	3	4	5	6	7	8	9	TOTAL	PLACE
WARREN WILLIAMS	18:30.4									18:30.4	1

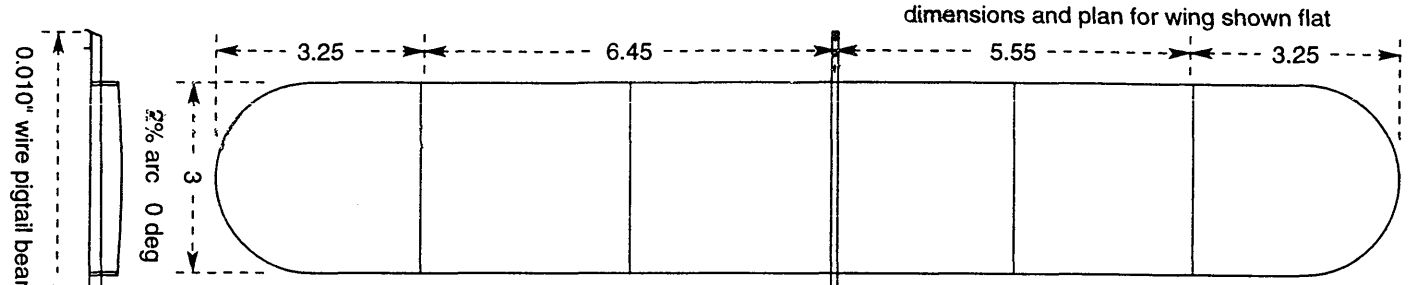
WALLY MILLER INTERNATIONAL
EZB COMPETITION

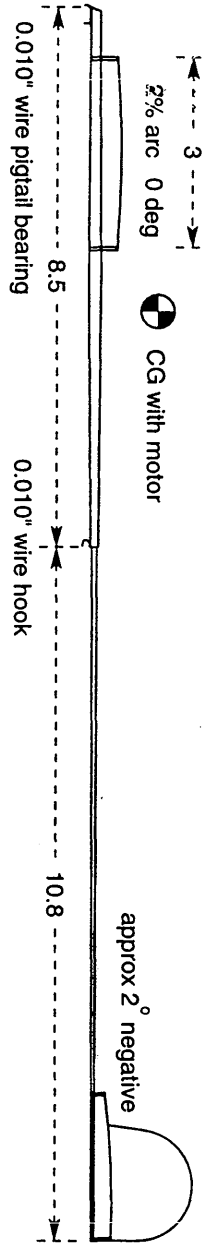
RESULTS

NAME	1	2	3	4	5	6	BEST	2ND	TOTAL	PLACE
BARR, LAURIE	18:56	22:05	22:15	21:17	28:19	29:00	29:00	28:19	57:19	1
CAILLIAU, LARRY	2:40	25:47	28:48	27:02	27:26	28:24	28:48	28:24	57:12	2
PALRANG, MIKE		25:57		28:27	0:18	28:29	28:29	28:27	56:56	3
COSLICK, LARRY	25:58	27:46	28:39	27:46	25:11	22:44	28:39	27:46	56:25	4
HUNT, BERNARD	25:22	11:05	28:11	27:13	27:02	23:49	28:11	27:13	55:24	5
TIPPER, JOHN	21:06	23:09	23:54	25:16	26:11	26:08	26:11	26:08	52:19	6
DE SHIELDS, BOB	23:06	26:59	2:36	1:30		25:14	26:59	25:14	52:13	7
TAGLIAFICO, ANDREW	25:15	22:44	22:00	10:02	25;10	26:03	26:03	25:15	51:18	8
VAN GORDER, WALTER		24:11	24:33	19:55	18:59	25:53	25:53	24:33	50:26	9
BAILEY, BOB		23:12	22:52	26:32	9:01	20:53	26:32	23:12	49:44	10
GITLOW, LOU	20:25		23:12	25:09	23:55	23:35	25:09	23:55	49:04	11
KAGAN, JOHN	19:47	25:11	15:36	22:11	21:21	23:00	25:11	23:00	48:11	12
MILLER, WALLY	24:04	23:41	23:06	20:41	21:09	24:05	24:05	24:04	48:09	13
THOMPSON, MIKE	19:54	21:02	19:34	24:33	00:04	23:16	24:33	23:16	47:49	14
TAYLOR, TIM	15:18	22:30	19:35	5:56	21:38	24:44	24:44	22:30	47:14	15
LENDERMAN, JOHN	16:47	21:22	23:59	22:37	06:56	21:01	23:59	22:37	46:36	16
DORSETT, CHARLES	13:58	20:27	18:09	21:06	22:41	22:47	22:47	22:41	45;28	17
JOSHU, GENE		23:06	20:25	19:52	19:51		23:06	20:25	43:31	18

BERRAY, ED	17:22	17:23	5:37	13:44	20:38	20:26	20:38	20:26	41:04	19
STEVENS, DARRYL		14:43	16:52	20:44	19:29	19:24	20:44	19:29	40:13	20
YATES, DAVE	17:21	18:00	19:24	18:47	17:26	20:27	20:27	19:24	39:51	21
HOFFMAN, EARL	18:48	:06		18:47	20:32	15:28	20:32	18:48	39:20	22
WILLIAM, WARREN	16:13	00:06	04:50	02:42	19:40	00:05	19:40	16:13	35:38	23
COLLING, MIKE	14:44	15:35	14:51	15:45	15:38	16:30	16:30	15:45	32:15	24
SAMUELSEN, PETE	10:03	15:10	4:48	14:10	16:12	9:21	16:12	15:10	31:22	25
ROCH, EDMOND	14:28	10:29	06:48	9:59	15:09	00:18	15:09	14:28	29:37	26
CLEM, JIM					20:35				20:35	27
RIBWOLD, BOB										28

1st Place International EZB Contest





At rest the model has reverse warps:
approx 3/32" washin starboard wing
and 3/32" washout port wing

Winner of Wally Miller International at Kibbie Dome on Aug 4 1996 - 28.19 & 29.00.
Model set world "record" time of 33.04 at Cardington on Aug 25 1996.

3° upthrust, 1½° left thrust
Record flight motor 13½" 0.7g Tan 2 1994 (pink)
Launch torque 0.185 in.oz. 2500 wound, backed off to 2410. Max possible turns 2604 ?

Weights	oz	gram
wing	0.0054	0.153
M/S &baoom	0.0088	0.249
tailplane	0.0022	0.062
prop	0.0046	0.013
TOTAL	0.0210	0.0594

WOOD: All wood except prop and posts is 4½ lb, Youngs Modulus tested at "14.3" (50% above average). If you do not have good wood, use 5½ to 6 lb wood, or the model will be too weak to handle full turns!

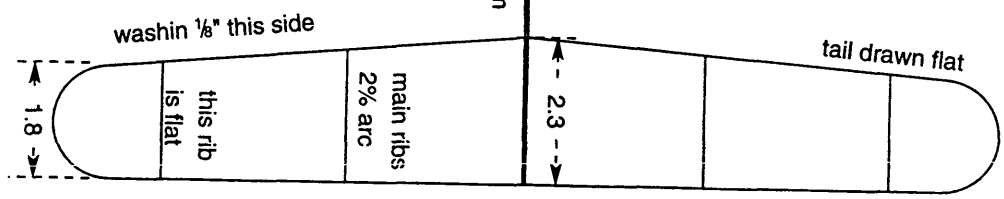
Wing tips: 0.023 thick, 0.040 at DH -> 0.030 at tip
Wing spars: 0.023 thick, 0.065 at root -> 0.040 at DH
Wing ribs: 0.022 x 0.035 deep pre-bent (microwaved) to 2% arc and sliced with stripper
Tailplane: 0.022 thick, taper 0.045 root to 0.030 at tip
Tail ribs: 0.022 x 0.026 deep, pre-bent and sliced

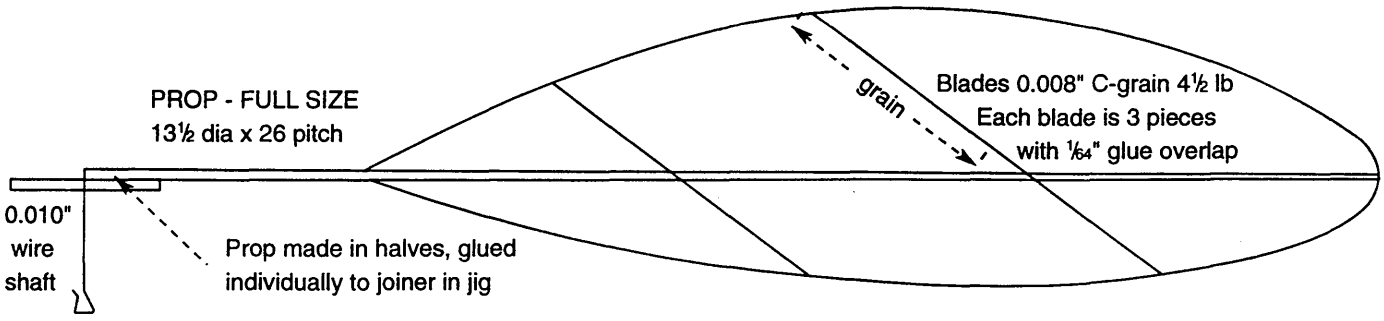
Motorstick: 0.1 wide, depth: 0.15 at nose, 0.195 middle, 0.12 rear
Tailboom: width 0.075 -> 0.040, depth 0.115 -> 0.045

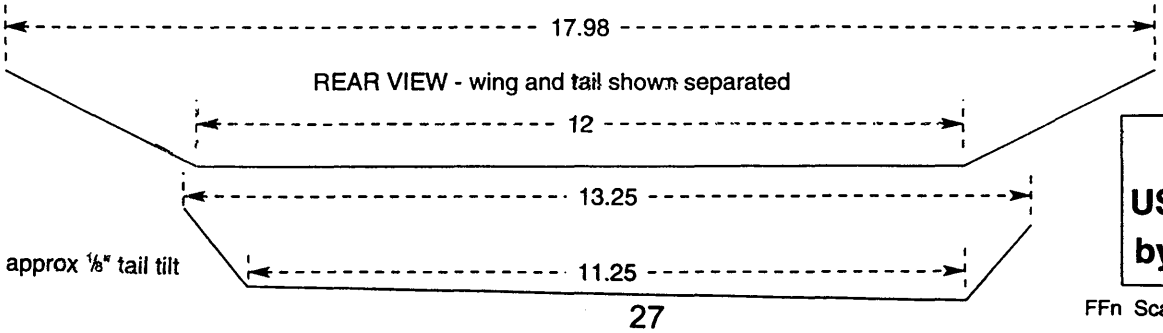
Propspar: 5½lb wood, dia 0.060 taper to 0.025

Wing and tail posts: 6½lb wood, 0.047 dia.
Tissue tubes glued to wing and tail, posts to fuselage

Covering: "wrinkled" PM2 Polymicro plastic



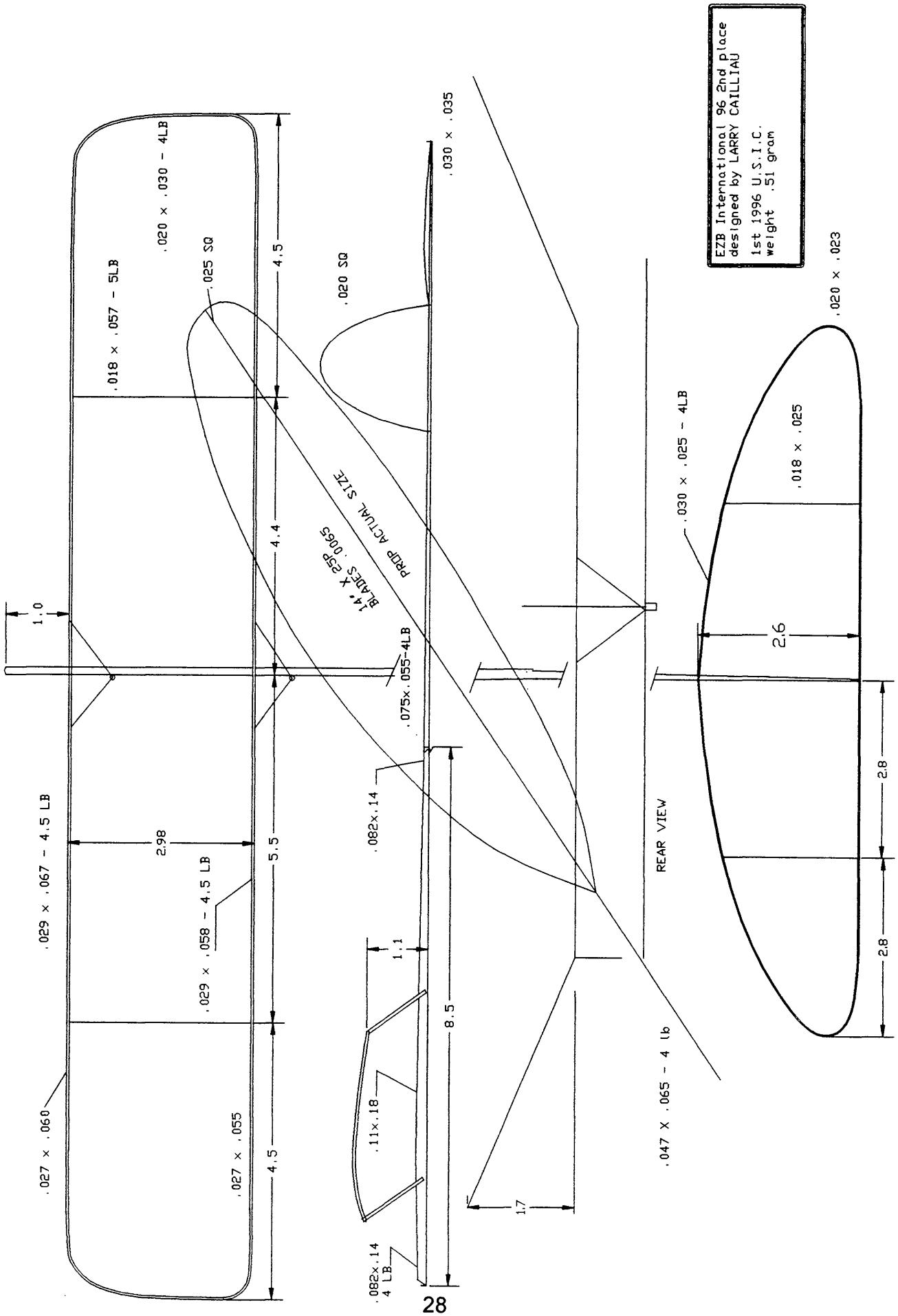




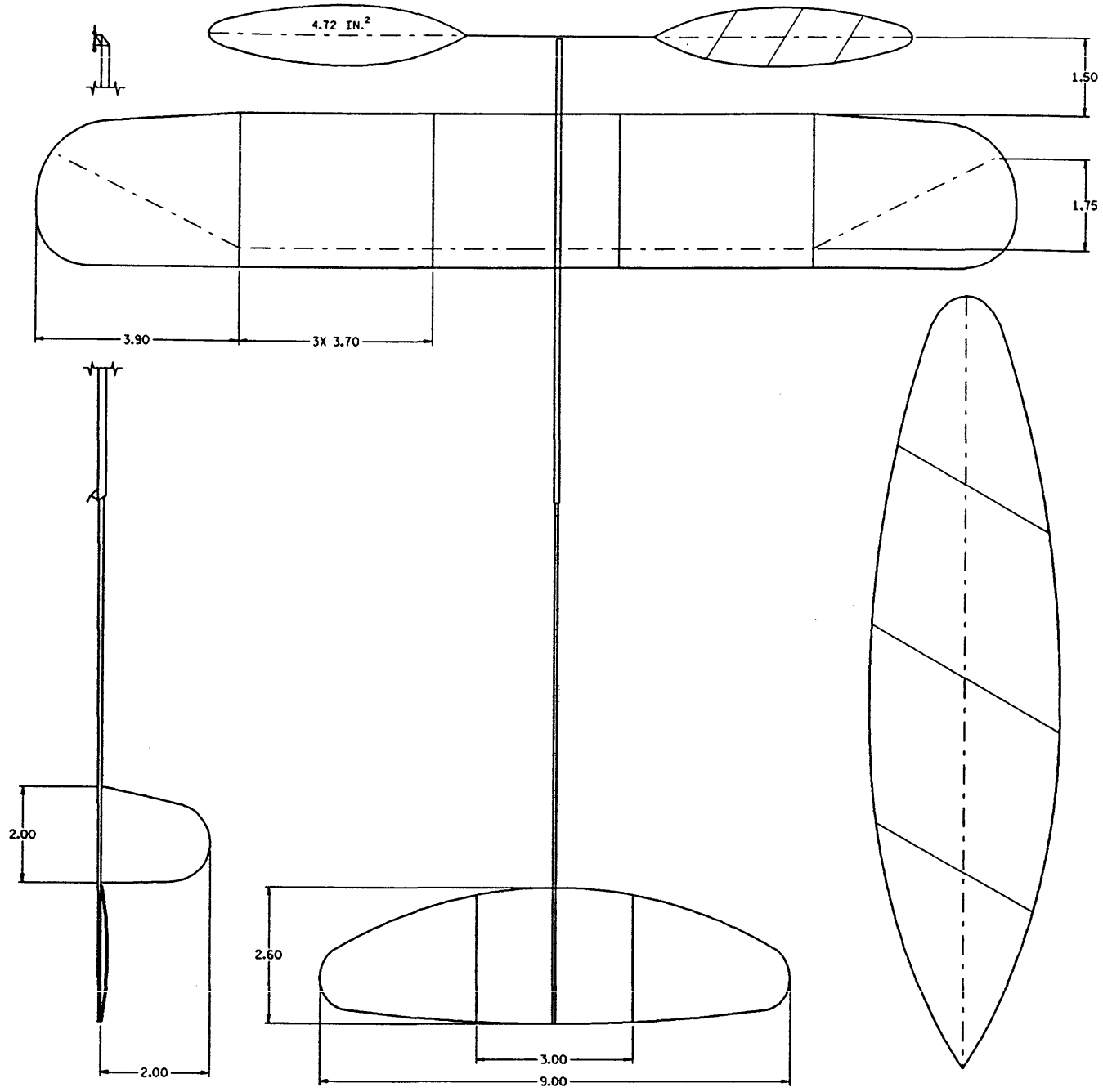
Miller Lite
USA rules EZB
by Laurie Barr

FFn Scale 1:3 All dimensions ins

2nd Place International EZB Contest



3rd Place International EZB Contest



WING

L.E. .028 X .093 - .028 X .055 (4.5°)
T.E. .028 X .090 - .028 X .050 (4.5°)
TIPS .022 X .055 - .022 X .026 (4.0°)
RIBS .018 X .040 (4.5°) 6" RADIUS ARC
POSTS □ .055 - Ø .055 X .75 LG. (5°)

STAB

SPARS .022 X .033 (4.0°)
RIBS .021 X .030 (3.8°) 7.5" RADIUS ARC

MOTORSTICK

.093 X .165 X 9.0 LG. (4.4°)
PROP BEARING Ø .009 WIRE W/ .010 GUSSET
REAR HOOK Ø .007 WIRE W/ .010 GUSSET

TAILBOOM

.055 X .107 - .035 X .040 X 10.0 LG.
RUDDER .025 X .025 (4.5°)

PROP Ø 14 X 28 PITCH

SPARS .040 X .070 - .013 X .013 X 7.0 LG.
PROP SHAFT Ø .009 WIRE
BLADES .006 THK. (4.0°/4.5°)

WEIGHTS

WING DRY 107 MG
WING COVERED 155 MG
WING COMPLETE 160 MG

STAB DRY 19 MG
STAB COVERED 33 MG

MOTORSTICK 160 MG
MOTORSTICK COMPLETE 173 MG

TAILBOOM 48 MG
TAILBOOM W/ RUDDER 56 MG

PROP SPAR W/ BEARING 41 MG
PROP BLADES 36 MG EACH
PROP COMPLETE 124 MG

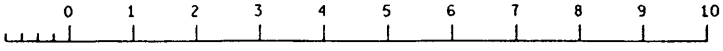
COMPLETE PLANE W/ REPAIRS
W/O PROP 435 MG

ADJUSTMENTS

WING INCIDENCE -1.1°
OUTBOARD PANEL WASHIN 3/32
TIP WASHIN 3/32
TAILBOOM INCIDENCE 0°
STAB TILT T/16 ON EACH SIDE
PROP BEARING 0° DOWN & 2° LEFT
C.G. W/O MOTOR @ T.E.

MOTOR

BEFORE PRE-WIND 12.75" LOOP .032 X .044
TAN II 4-95 590 MG
WOUND TO .28 OZ.-IN. & BACK-OFF 100 TURNS
LAUNCH @ .13 OZ.-IN. & 2345 TURNS



EZ-B #6

MIKE PALRANG
6 SEP '96

AMA RECORDS UPDATE
OPEN CLASS

Catapult Glider Unlimited Class			
CAT I	2/18/96	1:12.3	Roy White
CAT II	2/18/96	1:29.4	Robert Roman
CAT IV	8/3/96	3:07.00	Bob DeShields
Catapult Glider Standard Class			
CAT I	2/11/96	1:03.4	Roy White
CAT I	2/18/96	1:12.3	Roy White
CAT III	3/96	1:32.7	Wes Anderson
CAT IV	8/3/96	3:01.03	Bob DeShields
Mini-Stick			
CAT I	1/13/96	9:18	Jim Clem
CAT I	4/11/96	9:23	Walter Van Gorder
CAT II	1/1/96	4.38	Don Crosby
CAT II	1/7/96	9:11	Edward Berray
CAT III	1/1/96	6:43	Don Steeb
CAT III	3/10/96	10:18	Walter Van Gorder
CAT III	10/6/96	11:23	Walter Van Gorder
CAT IV	1/28/96	6:29	Gary Underwood
CAT IV	1/28/96	7:15	Karl Van Buran
CAT IV	1/28/96	9:08	Robert Eberle
CAT IV	4/15/96	11:34	Walter Van Gorder
CAT IV	8/10/96	14:28	Andrew Tagliafico
AMA Stick			
CAT I	1/22/96	39:19	Bob Randolph
EZB			
CAT I	2/11/96	21:44	Larry Coslick
ROG Stick			
CAT I	2/11/96	14:08	Larry Coslick
CAT II	4/11/96	14:32	Larry Coslick
Hand Launch Stick			
CAT IV	9/27/96	58:08	Steve Brown
Helicopter			
CAT IV	8/2/96	12:00	Larry Coslick

JUNIOR CLASS

Helicopter			
Cat IV	8/2/96	5:47	Nick Leonard Jr.

1997 International Mini-Stick Postal Contest

The St. Louis Thermaleers invite all indoor flyers to take part in the 1997 International Mini-Stick Postal Contest to be held over the winter period. The rules for the contest will be as follows:

1. The contest is open to Indoor models that comply with the Living Room/Mini-Stick rules.

2. Contest flights are to be made between 1 Jan.. 1997 and 31 Mar., 1997.

3. Any number of flights can be made at any number of sites.

Wing

4. All contest flights to be timed by someone other than the flyer.

5. All contest flights to be recorded on an official Results Form. (Included in this issue. Copies can be made.)

6. Best single flight time wins, after the flight time has been corrected for different ceiling heights. Ceiling height to be measured as per the FAI, but with a 5 meter diameter circle. The correction factor is 627 divided by (167 plus 46 times the square root of the ceiling height in feet). The time in seconds will be multiplied by this to give the corrected time.

7. Prizes will be awarded dependent on the number of contestants.

8. All Results Forms to be returned no later than 10 April, 1997 to the address below:

9. Entry is free to all contestants.

10. Results will be sent if a S.A.S.E. is included with the Results form.

Send your results to:

Larry Coslick
4202 Valley Crest Hills Drive
St. Louis, Missouri 63128

MINI-STICK MODEL RULES

Monoplane, max span	7.0 in.
Max Wing Chord	2.5 in.
Stick Length	5.0 in.
Max Model less (less prop)	10.0 in.

Stab (Tail) Area Max = 50% of

Covering Plastic/paper. NO microfilm

Propeller Wood Prop, 7" dia. max.
Minimum Weight (0.43 gms)0.015 ounces

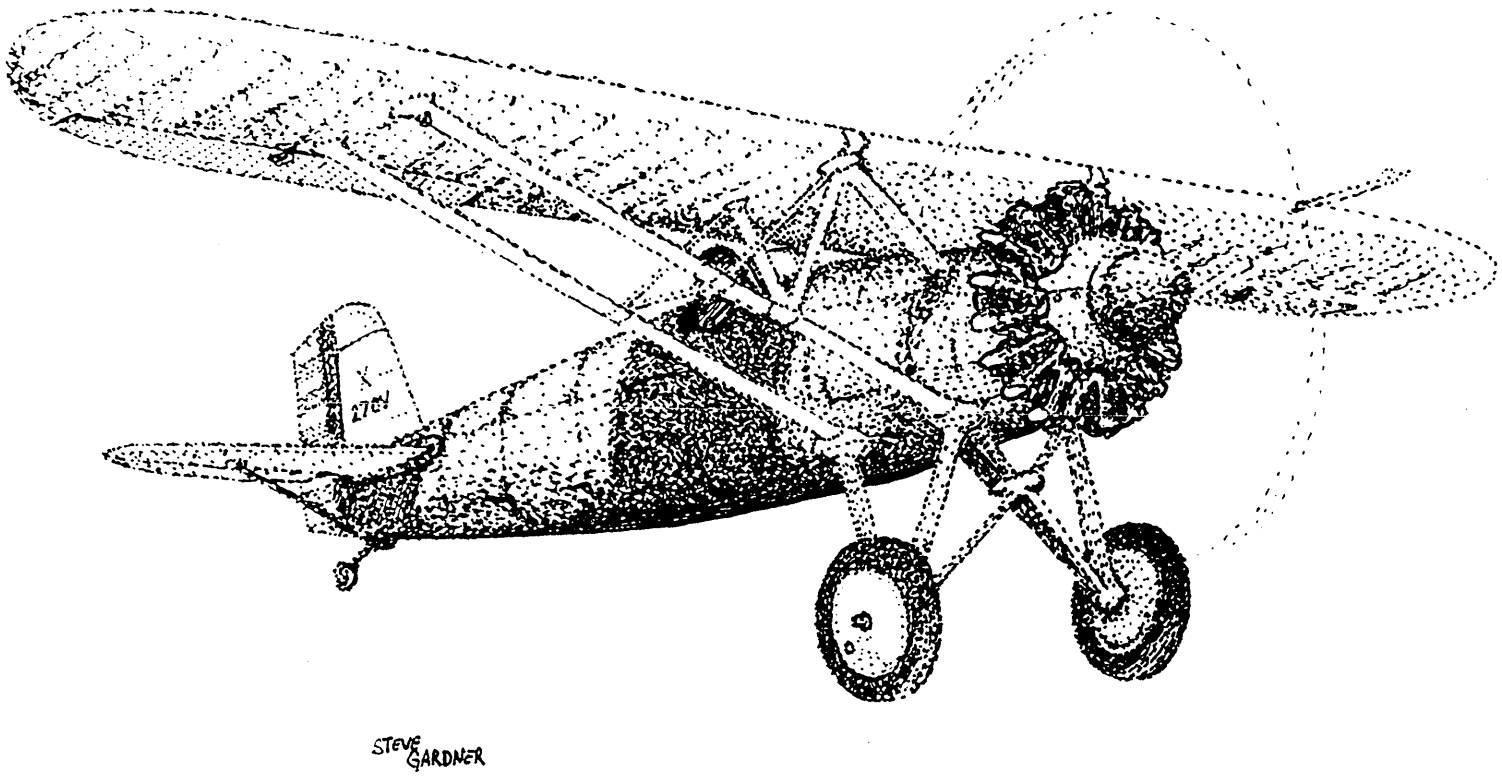
Flying
Steering 4 Ten Second Steers*
Attempt 15 Seconds or more*

*Special rules for very small rooms only! (Living Room flying.)

INVA

Indoor News and Views

ISSUE #90 Feb 1997



Boeing Model 202 (XP-15)

INDOOR NEWS AND VIEWS (INAV) IS PRODUCED IN ST LOUIS BY ROY WHITE, LARRY COSLICK, HOWARD HENDERSON, BILL MARTIN, AND STEVE GARDNER

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The National Free Flight Society Needs Your Support

We are asking our subscribers to join and support the NFFS. The NFFS is instrumental in obtaining the Johnson City site for the Indoor National Championships. The NFFS also supports indoor free flight with coverage in their magazine. In recent months the NFFS has had increasing costs which need to be covered so that they can continue to champion our cause. If your are not a subscriber to the NFFS magazine, we encourage you to subscribe. If your are already a subscriber, consider making a donation to help this worthwhile organization. Clubs can get involved and really make a difference.

NFFS MEMBERSHIP AND RENEWAL APPLICATION

Make checks payable to:
National Free Flight Society

NFFS Mail to:
NFFS
3317 Pine Timbers Drive
Johnson City, TN 37604-1404

Dues include an annual fee of $.50 for membership in the National Free Flight Society. The balance of the dues is for subscription to *Free Flight*, the NFFS Digest. Subscriptions or memberships are not available separately.

Age 19 & over (US only)	1 year $20.00 2 years $39.00
Junior (US only) Age 18 & under Ages are as of July 1 of the current year. Supply proof of age.	1 year $7.50 2 years $13.50
All Non-US Residents	1 year $24.00 2 years $47.00
Life Memberships US Residents Non-US Residents	 $450.00 $500.00

Include payment in US dollars and this form:

New Member ☐ Renewal ☐ Address change ☐

Current expiration date: Mo. Yr.

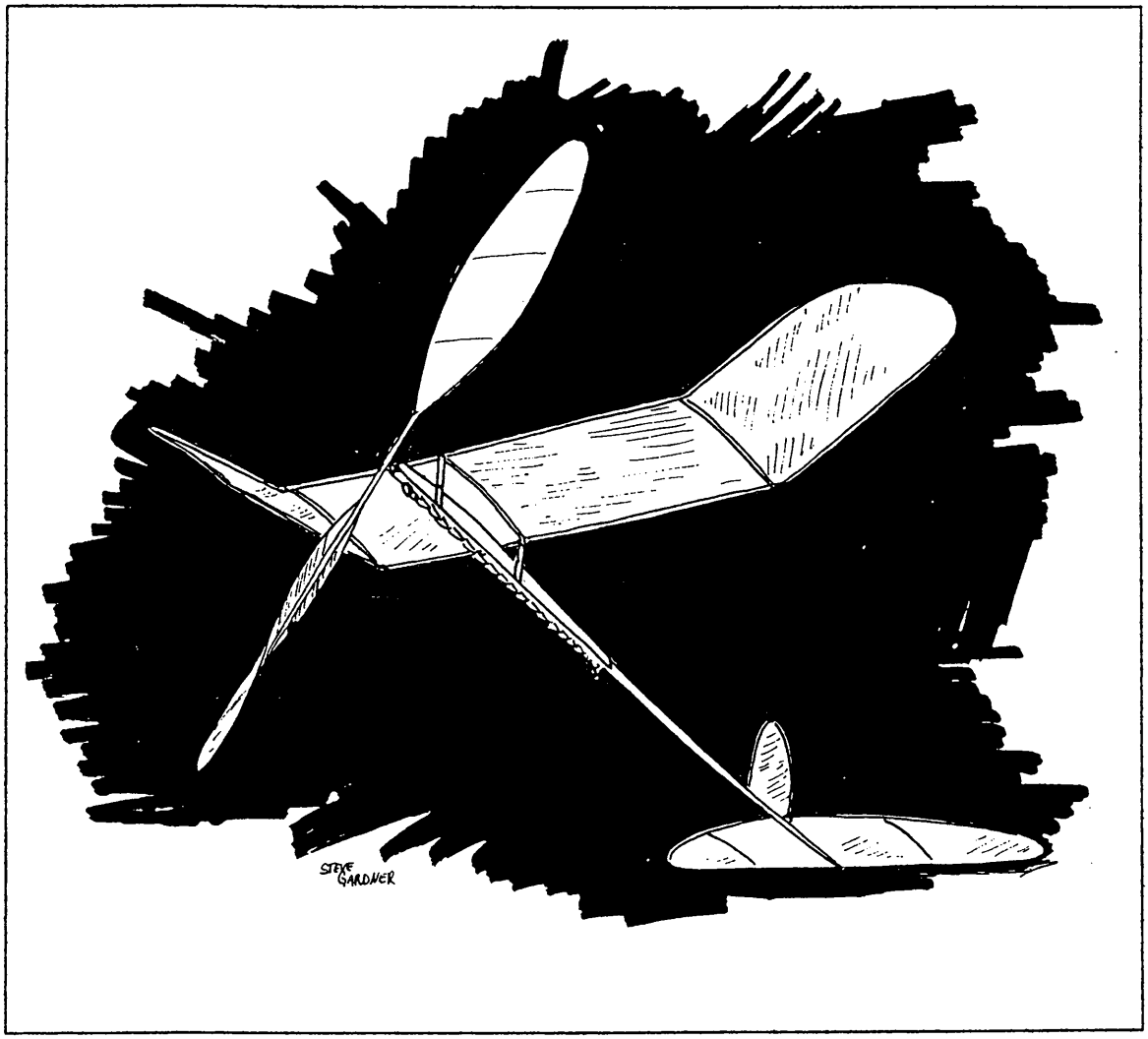
Name	AMA # (US only)
Address	Telephone # (US only)
City, State	Zip

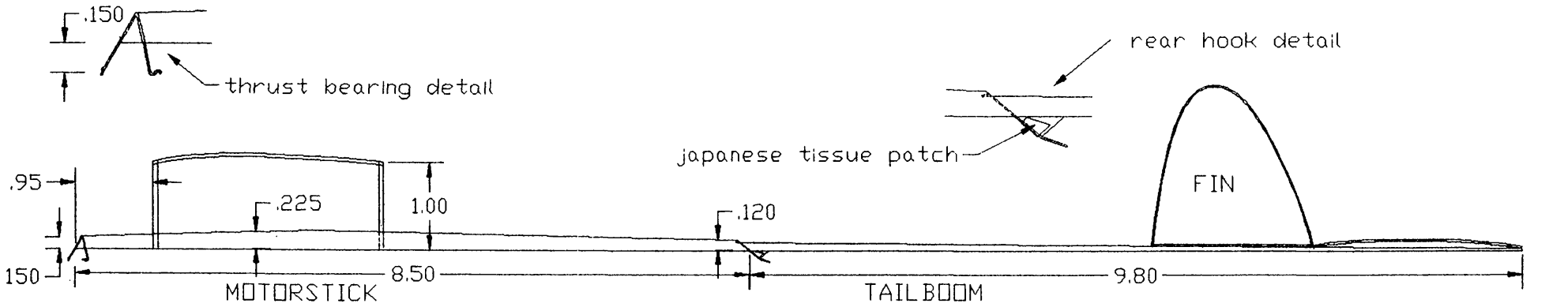
Send *all* renewals, changes-of-address, new applications, and membership questions to the Membership Office.

Hobby Shop EZB

by Larry Coslick
Illustrated by Steve Gardner

This building and trim article is intended to help the new modeler eliminate some of the frustrations when starting out in this fascinating hobby. It is a detailed description of my methods for constructing an EZB. The prototype was built entirely from hobby shop wood, and was quite strong at .61 gram. Following these directions this EZB should come out weighing less than .75 grams using only wood available at your local hobby shop. At this weight the model could fly from 22 to 25 minutes in a high ceiling site. For a new EZB flyer this is a very good performance.





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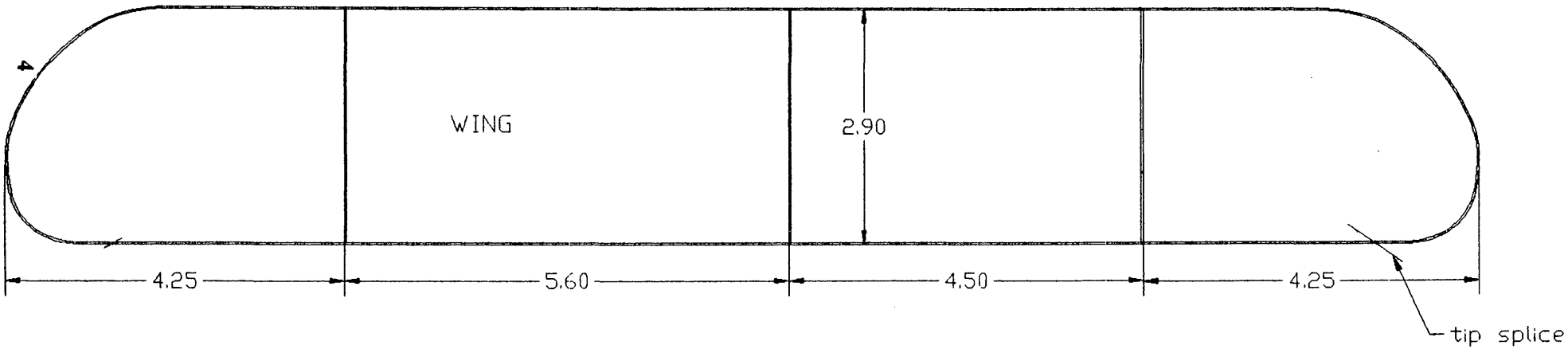
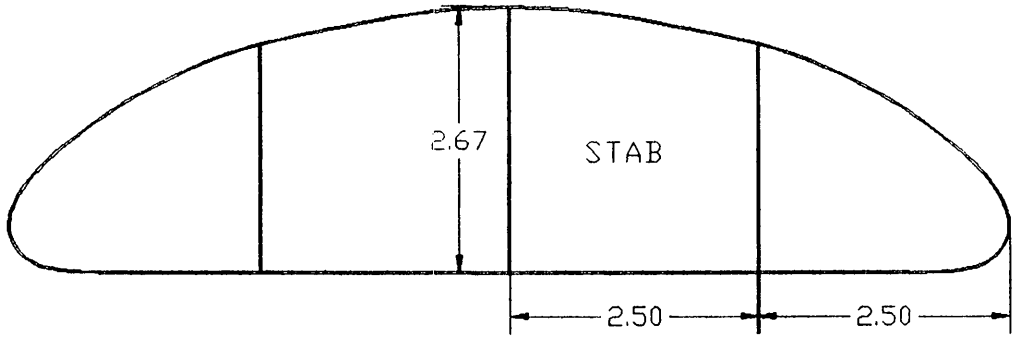


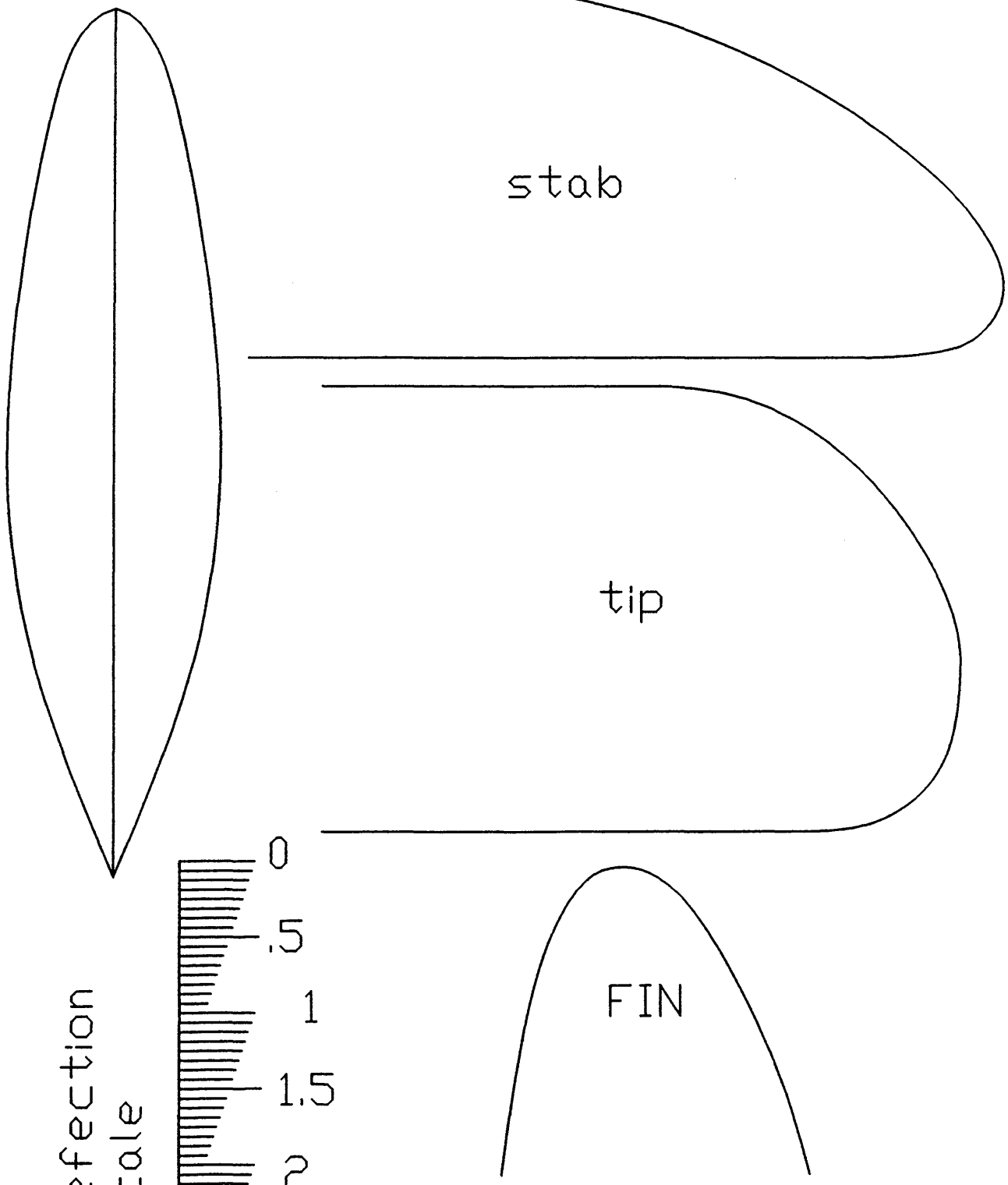


Hobbyshopper

Designed by:
Larry Coslick
Drawn by:
Steve Gardner

1-18-97

HOBBY SHOP EZB

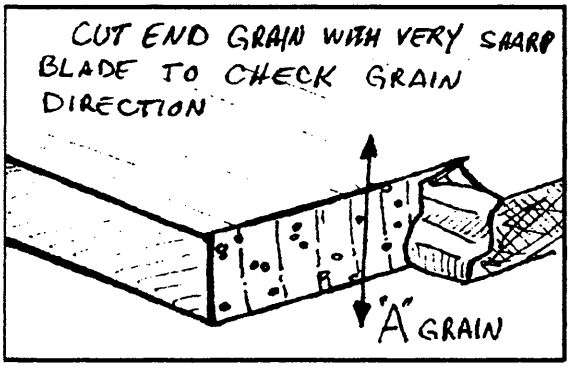


Full Size Outlines

BALSA SELECTION

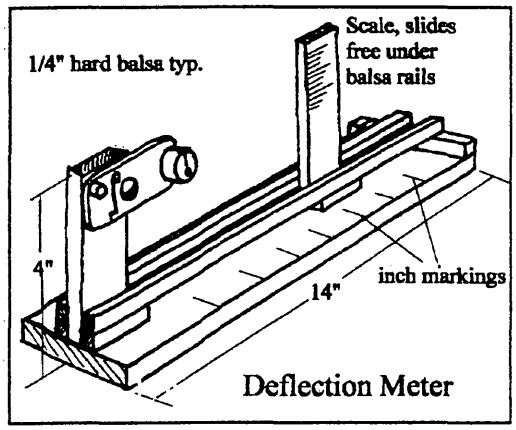
The most important part of building a competitive EZB is the selection of the proper wood for each part. The wood is available at any hobby shop with a fair selection of balsa sheet. Special indoor wood is not needed. The wood used for the prop blades may be a possible exception.

The first consideration when choosing wood is weight. The density, or weight, of balsa is measured in pounds per cubic foot. We say a certain piece of wood is "six-pound wood", and on some plans it may be marked "6# wood". Each component of an EZB is made from a certain weight wood. The very lightest wood is about 3.5 to 4 pounds per cubic foot. Wood with a weight of about 5 to 6 pounds per cubic foot is much easier to find at an average hobby shop, so this EZB is made mostly from this wood. Take a postage scale to the hobby shop and check each piece before you buy it. To check the density of a piece of wood first weight the piece to find its weight in grams. Then find its volume by multiplying its thickness by its width, and then multiplying that number by its length, in inches. We are mixing units here, but grams (metric) are easier to use for weight, while inches (English) are still what everyone used for small measurements. To use these together we take the weight in grams and divide by the volume in inches, then take that number and multiply by 3.81 to get pounds per cubic foot. A piece of 1/16 X 3 X 36 wood in the 5 pound range will weigh about 8.9 grams and a six pound piece about 10.6 grams. By figuring out what the wood will weight in a certain size sheet you can use a postal scale right at the balsa wood rack in the hobby shop to choose wood. You should buy "A" grain wood for EZBs. (see drawing)

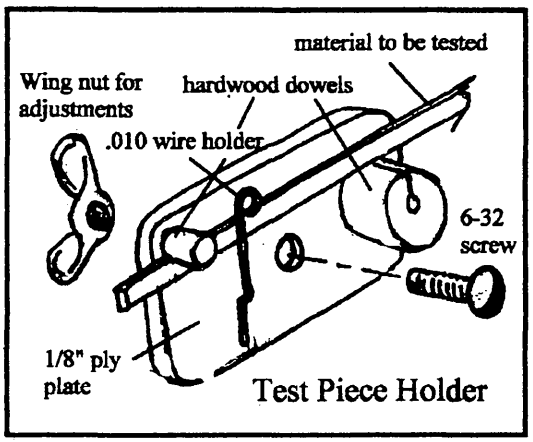


Because the density of balsa wood can vary a great deal in any given sheet of wood the next step is to hold the sheet in front of a swing arm lamp with at least a 40 watt bulb. Turn off all the other room lights so that you can see the light coming through the balsa better. The wood will have a brown color that is lighter where the wood is the lightest in weight. The wood that you want is the lighter streaks or sections of wood that the most light is coming through. Mark these areas with small dots from a felt tipped pen while holding the wood up to the light. When you look at the wood when you turn the room lights back on you will probably notice that the wood you have marked is very light in color, almost white, and that it shows almost no grain at all. The areas marked are not usually very wide, yet you will not need much for several sets of wing spars, or ribs etc. When you cut these very small areas out leave a half an inch or so of darker , heavier wood to serve as a handle for the good wood. This will make cutting spars and other parts from this wood much easier. This method of picking out the wood will work even with 1/4 inch wood which you might use for motor stick wood. Cut the good wood out of the sheet and recalculate the density of the good piece. It might be as light and stiff as the special indoor wood and it has straight , smooth grain.

The next most important thing to check about balsa wood is its stiffness. Cut a test spar from each of the good pieces of wood and test them on the deflection meter. (see drawing) Use colored marker pens to grade the wood for stiffness so that you can tell which piece made the stiffest spars. If you do not mark them you will get them mixed up and have to test them again. You may be surprised at the difference in stiffness between one spar and the next, cut right beside the first. Simply selecting the stiffest wood from a given section will really improve the model.



Deflection Meter



Test Piece Holder

SANDING

The sanding blocks are cut from pine, .75" X 1.5" X 5". Slightly round the long edges with sandpaper. Cut the sandpaper so that it wraps up around both sides. Use 220 wet or dry paper for the first cut and finish with 360 grit. To sand the wood for the prop blades, or any other wood that you need to be a certain thickness, the ends of the sanding block are spaced up to the height of the wood thickness. To do this shim stock is glued to the ends of the block. It can be made from metal, plastic or masking tape. It takes some experimenting to find the correct amount of shim for each application.

Glass makes a good surface on which to sand. I use a piece of double strength glass 10" X 24" which is mounted on several layers of foam board, painted flat black, (no lacquer). The glass was then taped to the foam board with duct tape to safety and protect the edges.

Sanding prop wood - It can be sanded to around .020" by carefully sanding with a back and forth motion. Once the wood is this thin you must start to sand in one direction only, away from the end that you are holding down on the glass. Make sure to stroke the sanding block past the end of the sheet and to lift the sanding block completely off the glass before making another stroke. Start with 1/32" C grain balsa and take it down to .008". This will take about 45 minutes, so be patient.

MOTOR STICK

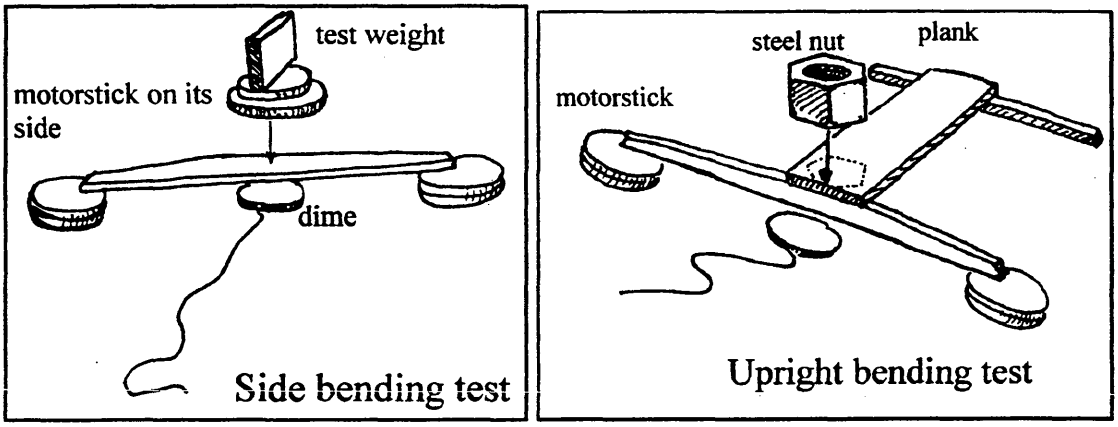
MOTOR STICK——————8.5"————4.5#——AB GRAIN————.185 GR.

Selecting good Motor stick wood is perhaps the hardest part of building an EZB. The wood must be light and springy. Punky wood will take a set, and the models flight characteristics will change making the model's flight unpredictable. Do not accept a motor stick that won't spring back after bending it noticeably to the right and in a downward plane when viewed from the front. When selecting motor stick wood cut them from 3/32 or 1/8" stock, preferably 3/32". For this project I found a piece of 3/32" AB grain. The sheet had several 1/2" wide sections of white wood sandwiched in-between wide bands of dark wood. I drew the outline of the motor stick

right on the sheet and cut it out with a new razor blade and straight edge. The sides were left straight. With no sanding this motor stick weighed .185 gram, and was just right for this model. I cut 10 sticks and found lighter ones, but felt that this weight stick was one that most modelers could find. If you are able to find a stick that is lighter and stiffer, use it.

Stiffness test for the motor stick-- Coins are used to make the weights and spacers for this project because they are fairly consistent and available to everyone. Using new pennies, CA 2 pennies together. Make up several sets. Find a spot on the face of 2 sets that is .12" thick, and mark that spot with a magic marker. Take a nickel and quarter and CA them together to make one of the test weights. Cut a piece of balsa 1/8" X 1/2" X 1" long and CA that to the nickel as a handle. This is one of the weights used to measure motor stick bend. It weighed 10.67 gram. Find a dime that is .051" high and CA a piece of thread to one edge. This will be used as a test spacer so don't get any glue or thread on the faces of the coin. The last weight to be used is a 5/8" coarse thread nut (hardware, auto parts store) that weighs 31.89 gram. The support for the nut is called the plank. Make it out of a piece of 1/8" X 1/2" X 4" balsa. On one end of the plank glue a 1/8" square x 3" long foot.

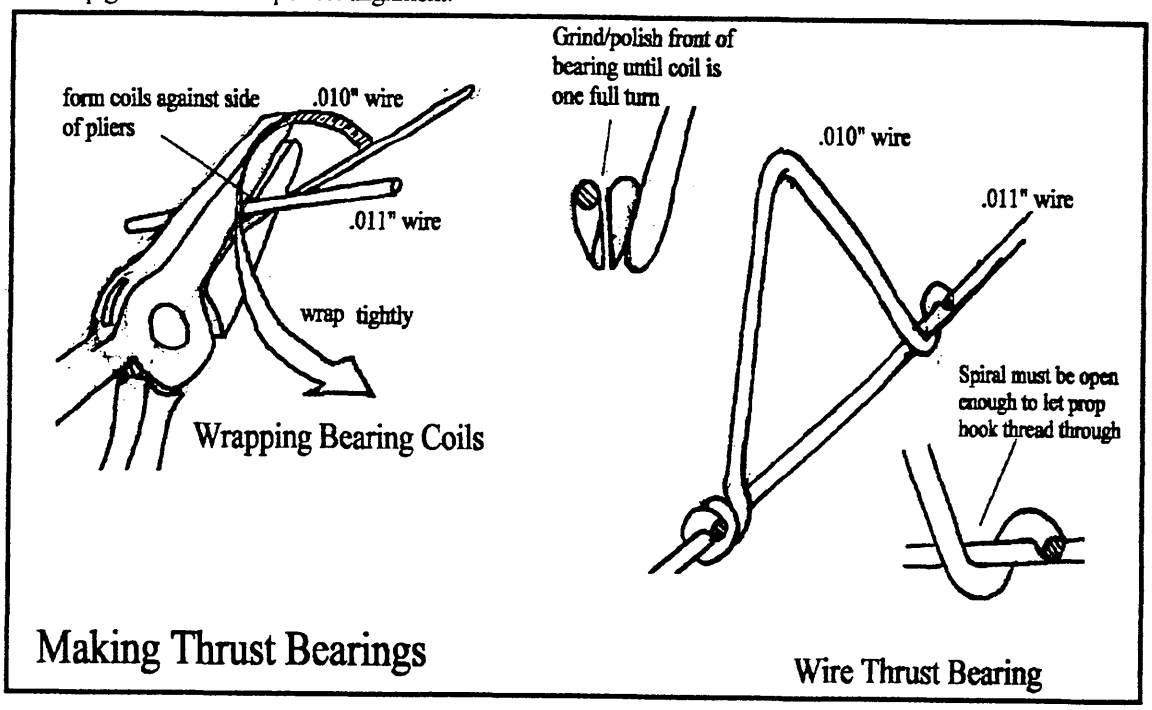
TESTING--Use any flat, hard surface to make this test. Place the motor stick flat on its right side across two sets of pennies with each end of the motor stick resting exactly on the center of one of the penny sets. Turn the penny sets to where the .12" thick area is under the end of the motor stick. Use a ruler to find the center of the stick and place the spacer dime under the center of the stick. Place the test weight made from the nickel and quarter above the dime on top of the motor stick. The motor stick is a good one if it doesn't bend far enough to touch the spacer dime. If it is too close to see clearly, then gently tug on the thread to see if the spacer dime rubs the stick. Place the motor stick upright and place the plank end on top of the motor stick. Place the nut on top of the plank with the outside edge of the weight lining up with the outside of the motor stick. Again, the motor stick should not touch the dime. See drawing:

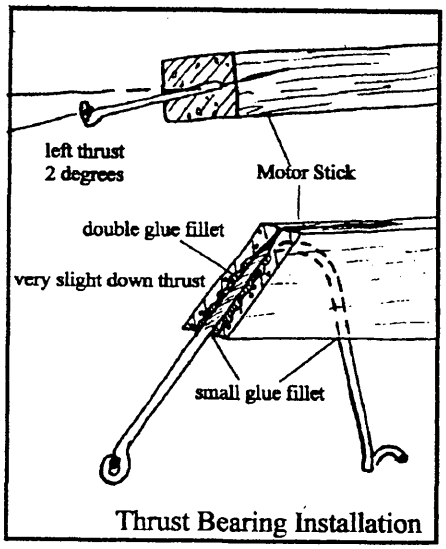


Wire Bearing and Rear Hook

The wire bearing , called a "thrust bearing", is made from .010 music wire. To make the bearing the wire is tightly wrapped around a piece of forming wire that is .001" larger than the bearing wire, or about .011". All the "music wire" mentioned in these instructions can be purchased very inexpensively at the local music store in the form of Guitar strings. A very good pair of needle nose pliers are a very nice thing to have when making thrust bearings, if you are going to fly indoor, get some! See the illustration on bending the bearing. Note that the bearing supports the prop shaft at two points. There is the front of the bearing, and there is the "pig tail", so called because that is its shape. After the bearing is formed, it will usually require some adjustment. The pig tail might be out of align with the front of the bearing, or vice-versa. Insert the forming wire in either the pig tail or front of the bearing and bend to realign. The bearing must swing free on the prop shaft. This will not happen until the front of the bearing

and the pig tail are in near perfect alignment.





Before mounting the thrust bearing to the motor stick, make sure that the prop shaft can be threaded through the bearing. If the bearing front end is not ground down far enough, or if the pig tail is not properly formed, the prop shaft will not thread onto the bearing. Make sure that the front of the bearing is ground down to match the drawing. If the problem is with the pig tail, you might be better off by just making a new bearing. Once the bearing is made and you have it aligned you can use it to help get the prop shaft square with the prop spars. Temporarily mount the bearing to a 1/8 sq. piece of balsa, like a false motor stick. Do not mount the bearing on the real motor stick for this step, the pressure of getting the prop shaft straight might weaken the glue joint. At this time I have the prop shaft mounted to the prop spar. No blades. Put the shaft through the bearing and hook up a thin loop of rubber. Put in some hand winds and check to see if the spar is running true. If there is any wobble in the prop spars as they turn, make note of which spar is most forward, and then, grasping the prop spar where the wire shaft is bent and glued to the spar, bend the shaft until the prop spars turn straight. Go easy and make very small corrections.

Remove the thrust bearing from its temporary mount and clean off any glue. Cut a 1/4" deep slot in the front of the motor stick. Angle the slot to provide 2 degree left thrust. Place a piece of .010 wire 3" long through the bearing to check the thrust line. Slide the bearing into the slot. The reference wire should be .150" below the bottom of the motor stick. Do not place glue in the slot. The front of the bearing should intersect the lower right angle of the motor stick. (see drawing) Take a new razor blade and cut the front of the motor stick to match the front angle of the bearing. Recheck for 1 degree down and 2 degree left thrust. The front of the bearing must be flush with the motor stick. Apply two thin coats of glue, to the wire and wood. Build up a small glue gusset where the pig tail and the front of the bearing meets the wood. No extra glue is needed.

Cut a 1/64" slot at the rear of the motor stick. The motor stick and boom are joined by a scarf joint. Cut a piece of .009 wire 5/8" long and bend over one end 1/16" long. The 1/16" hook will be imbedded in the wood but the wire will be flush with the rear of the motor stick. Tack glue the wire in place. Cut an angle on the tail boom to match the motor stick and pre-glue both surfaces using Ambroid glue. Attach the boom and make sure the bottom of the boom is even with the bottom of the motor stick. Cut a gusset, so that the end of the gusset is .125" below the motor stick. The gusset is glued to the boom. Place a strip of Japanese tissue over the gusset and wire. You can angle the wire again where it breaks away from the gusset. Cut the wire to a usable length. (see plans)

Boom

Boom———9.80"———6#———.04 gram

I cannot stress enough the importance of a good EZB tail boom. It needs to be fairly stiff and light. When they are not stiff enough the model will usually flounder under high launch torque.

To get a tapered boom start with a sheet of good clear grained 6# wood 11" x 1" x .062 (1/16 sheet), and sand it down to a taper from .062 at one end to .028" at the other, using a 220 grit sanding block. Once the sheet is tapered in one direction the boom can be cut to a taper in the other direction using a Harlan stripper or a good eye and a straight edge. This taper is from .075 " to .028".

The boom is used on the model with the .075" side vertical so that the boom is stiffest in the vertical plane. If you build and use the deflection meter the boom is tested in the same position. Insert the large end of the boom into the hold down and adjust the pivot and the scale until the end of the boom is right at the 0 mark. With a .270 gram weight trimmed from a paper clip hung on the very end of the boom, there should be less than 1 1/8" deflection. A deflection of around 3/4" is a good boom.

Stab

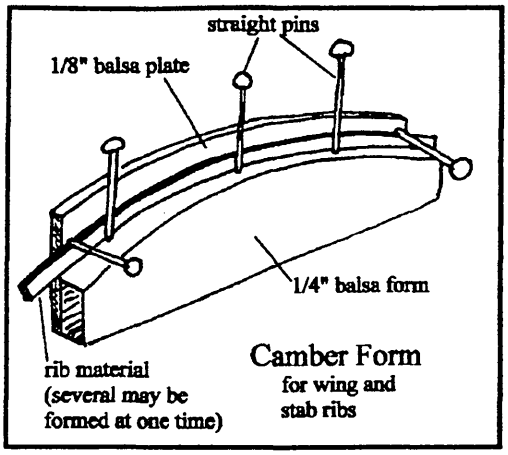
STAB CONSTRUCTION

PROJECTED WEIGHT ———.05 GR.
OUTLINE ———.025" X 0.27" X 24" ——— 5.0 #
RIBS ——— .017" X .027" ——— 5.0#

Make the template from .032 sheet balsa and coat edge with CA. Cut vee notches at the rib locations so that the ribs will clear the template.

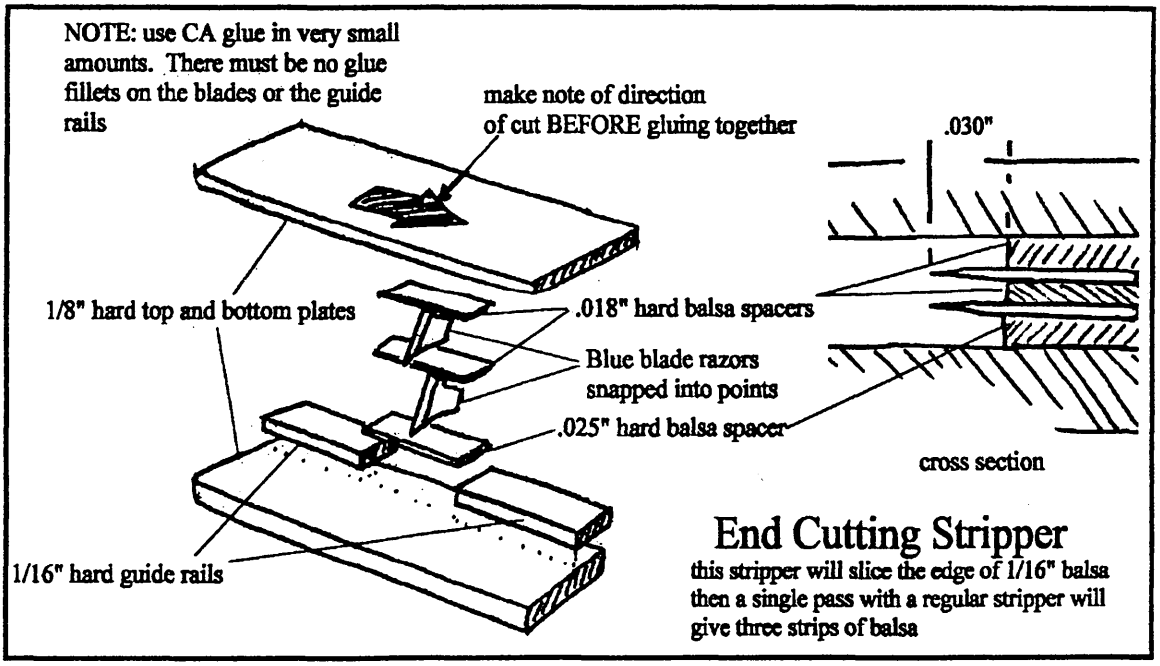
FIN ——— .025" X .025" ——— 5.0 #

Select from either 1/32" or 1/16" stock for stab wood. Use A- grain with a density of 4.0# to 5.0#, and cut the sheets 24 " long. A 24" outline will wrap all the way around the stab template , but if you have trouble finding a good piece of wood this long, you can cut the spars and splice to get the correct length. When wrapping the thin outline around the template it's easy to put a twist in the wood. To keep this from happening, mark thin black lines every 4"or 5" along the edge of the sheet you will cut the spars from. These lines act as a reference when pulling the wood around the template. To get the wood strip to wrap around the template without kinking you must hold a bit of tension while pulling the spar around the curve of the template. You can either sand the wood to .025" thickness or use Steve Gardner's stripper (see drawing). His stripper cuts the stab and fin outline at the same time from 1/16 sheet. If you sand 1/32 down to .025" it is best to use a Harlan stripper (see tools list) if you have one. The dry outline should not weigh more than .025 gram. A light one will weigh .015 gram. Do not cut the outline dimensions any thicker, because it is over-built with the wood sizes shown.



Camber Form
for wing and
stab ribs

The ribs are stripped .027" high out of A grain and then stacked on a form. See illustrations for stab wood stripper and rib form.



End Cutting Stripper

this stripper will slice the edge of 1/16" balsa then a single pass with a regular stripper will give three strips of balsa

WING

Projected Weight——————————————————————————— .15 to .16 gr.
L/E————.030" X .067" X 10.5"————5.5#——————————————————— .028 gr.
L/E————Deflection————————————5/16" with .340 gr., paper clip at 5"
trailing edge————.027" X .067" X 16.5"————————5.5#——————————————.031 gr.
trailing edge————Deflection————————————1 1/16" with .20 gr. clip at 8"
Tips————.025" X .058"————.025" X .035" ——4#————————(2)——.022 gr.
Ribs————.020 X .055 X 3"————————————4.5#————————(3)——.010 gr.
Posts————.035 X .062 X 1.25"————————————6#————————(2)——.009 gr.
Paper tubes—3 wraps of Condenser Paper, or light Japanese tissue————(2)——.003 gr.

The leading and trailing edge spars are cut from selected sheets of A grain stock as described in the wood selection article. Use a Jim Jones or Harlan stripper to cut the spars to size. Test each spar for weight and stiffness using the deflection gauge. Select the L/E and trailing edge spar that comes closest to the spec sheet. The front spar is the most important component of the wing. It must be stiffer than the rear spar for the wing to resist unwanted flexing. To save weight the wing tips can be cut from very light wood. If you can find 3.5# wood, use it.

Leading edge spar - This spar is 10.5" long and is not tapered except for the last 3/4" on each end. Hand sand or cut this taper from .067" to .058".

Trailing edge spar - This spar is 16.5" long and the last 4" of the top of each end tapers from .067" to .035". Scribe a line to show the taper and sand or cut along the line. Mark the top of this spar with a felt marker to prevent using the spar up side down.

Tips - The tip wood needs to be sanded from 1/32" stock to around .025", not less than .022". Use 4# wood or less. Use a Harlan stripper, if you have one, or a straight edge to taper the 8" tips from .058" to .035".

Template - Mat board of the kind used to mount pictures or photos makes very good template material. It is available at all art stores and most picture framers. Balsa sheet 1/16" thick is also good. Make sure that you allow for the width of the spars and another .050" when you make the template to stay under the 3" chord limit for EZBs. Apply CA glue around the entire template edge and sand smooth when dry. This will prevent the template from swelling when you use water to make the bend in the tips. Pin the template to your building board with poster pins. These are 3/8" long pins with plastic heads. Push the pin all the way down to the heads so that they are not in the way of construction.

Construction - The first step is to soak the tip wood in water to allow them to be bent around the template. Gene Joshu suggested a good way to soak the tip and stab outlines. Lay the wood on a Formica counter top or table and use a watercolor paintbrush to run a bead of water along both sides of the wood. Let the water soak for about a minute, then place the tip with the .035" end at the rear splice marked on the plans. Trap this end of the tip in place with a balsa block and a pin and wrap the wood around the template while holding a very light tension. The other end of the tip will extend past the front splice. This will be trimmed off later when it will be matched to the leading edge spar. Once the tips are dry (about an hour) lay the rear spar in place with the top side marking up, and cut the scarf joints in the spar and the tip. Pre-glue and attach each tip to the rear spar. Place the leading edge on the template. The wood will extend beyond the rib. Make a scarf joint 1/8" beyond the rib and attach both tips to the leading edge spar. Be careful when making the last joint, its easy to cut either the tip or the spar too short .

Ribs - Sand a small sheet of 4.5# A grain balsa to .020". Strip 5 straight ribs .020" X .055" X 3.25", two of these are spares. Soak the ribs and then stack them on the rib form to dry. (See illustration) The ribs are placed with the front end against the leading edge spar, then they are carefully trimmed to length at the trailing edge spar. Check to be certain that the rib is not too long, forcing the spars apart or adding bend to the rib. Pre-glue the ends of the rib and the spot on the spars where the rib will be glued. Wait about ten seconds and place glue on one end of the rib and attach it to the spar in the proper place, then glue the other end of the rib to the spar. Make sure that the rib is vertical before this glue dries. After the ribs are placed its best to leave the wing on the template for one day. Make sure that the center rib is installed perpendicular to the wing spars to properly locate the wing posts. The wing post jig centers each post on the rib location. This jig is illustrated in the final assembly section.

Covering - This subject is not covered in this issue. I did a covering article which appeared in INAV issue 65,66, 67 Jan 93. If you need a copy, send a self addressed stamped envelope to INVA.

Placing Dihedral - After the wing is covered turn the wing over on a clean flat surface. Take a sharp double edged blade and cut scarf joints on the tip side next to each rib. Don't cut all the way through the spars. Lift the center section of the wing 2" above the table and break each joint where the cut was made. The tips will touch the table.

Now support the center section with balsa blocks. Place a small amount of thinned carpenters glue in each joint. After 2 minutes re-glue the joint. Carefully turn the wing over and block up each tip 1.7". Make sure the wing is not over 18" long from tip to tip. Place a small weight on top of the spar at each tip rib. After about one hour lift the wing and inspect each dihedral break. If there is a gap, close it with a sliver of balsa.

Wing Posts - Strip the posts 1/32" X 1/16" X 1" , 6# wood. Wing post installation is described in the final assembly section.

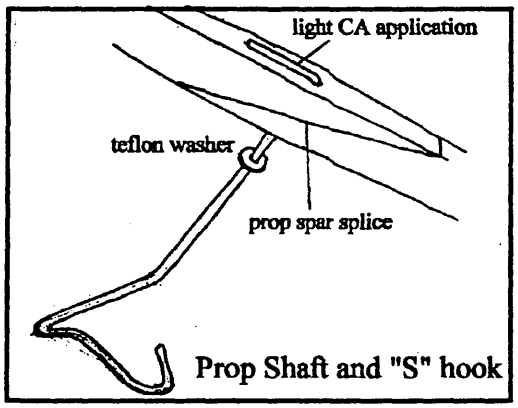
Paper tubes - Cut another piece of 1/32" X 1/16" balsa to use as a form for the tubes. Cut the tissue or condenser paper into 3/8"X1" pieces. Apply a bit of ambroid glue to one end of the form and place the tissue so that it is ready to wrap. The tissue should extend off the end of the form by about a 1/16" so that you will have an end to grab when you pull the tube off of the form. The glue will help you start the wrapping by holding the end of the tissue. After the first turn, when the tissue is starting its second layer, put a fairly large blob of glue on the tissue right at the form. Now as you continue to wrap the tissue around the form this glue will spread out and coat each wrap in the whole length of the tube. Once you have three or four turns wrapped around the form immediately grasp the end of the tube extending past the end of the form with your fingernails and pull the tube off the form. Set aside to dry an hour, then place back on the form and recoat the outside of the tube. Once the glue is on the tube pull the tube off again and let dry completely. Do not put the tubes on the wing posts too soon, or they will stick. A good idea from Steve Gardner.

Prop

Projected Weight ——————————————————————————.170 gr.
Prop Spar————12.5" X .047" X .075"——.025" X .025"—5.5#————————.035 gr.
Prop Spar————B grain——Deflection 3/8" each side with a .20 gr. paper clip
Prop Spar Wire—.010 music wire + spar ——————————————————.044 gr.
Prop Blades ———5.0 sq. in each blade————4.0# .008" (2)————————.120 gr.
Prop————————14" X 25" Pitch

Prop Spar - The spar is double tapered from 1/16" B grain , 5.5#. Look for clear uniform grain and cut several sheets 1" X 7". Sand a taper from .050" to .025" using a 220 grit sanding block. The spars are double tapered by cutting the second taper into them when they are cut from the sheet. Use a Harlan stripper or a straight edge to make this cut. Make several spar sets from each sheet. Test each spar for deflection as you did the boom. Both prop spars should match each other closely in deflection. Record the deflection of each set of spars. Pick the lightest, stiffest set of spars to use for the prop. When your final selection is made, cut a long scarf joint on the big end of each spar. (see drawing) Pre-glue the ends of the spars and join the two with ambroid. Pick up the spar after several minutes of drying time and realign if necessary.

Prop Shaft - I have used several styles of prop hooks and the S hook works best for me. It centers the O ring and does not creep up the hook. Sharpen one end of .009" wire and punch a hole through the narrow portion of the spar.(see drawing) Hone the end of the .010" prop shaft and push it through this hole in the spar. Leave just enough wire to accept 1 thrust washer and clear the end of the bearing by 1/16". Place needle nose pliers at the front of the prop spar and push the prop spar back towards the hook. Bend a 90 degree angle in the wire. Leave .2" of wire to glue to the prop spar. CA the wire to the spar using a straight pin to apply the glue. It just takes a small amount of CA so do not overdo it.. Check the spar on the dummy motor stick for trueness. The .2" of wire on top of the prop spar allows for easy handling when truing up the prop spar.

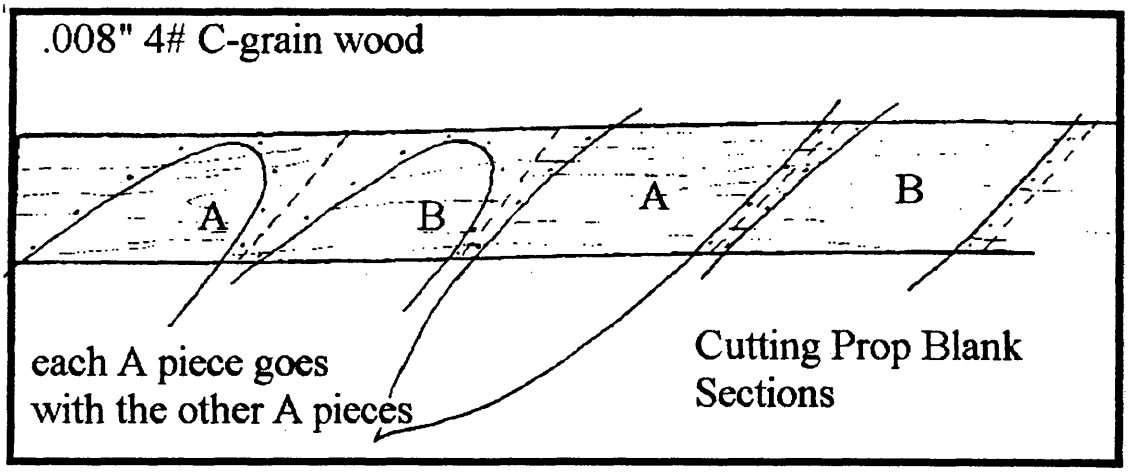


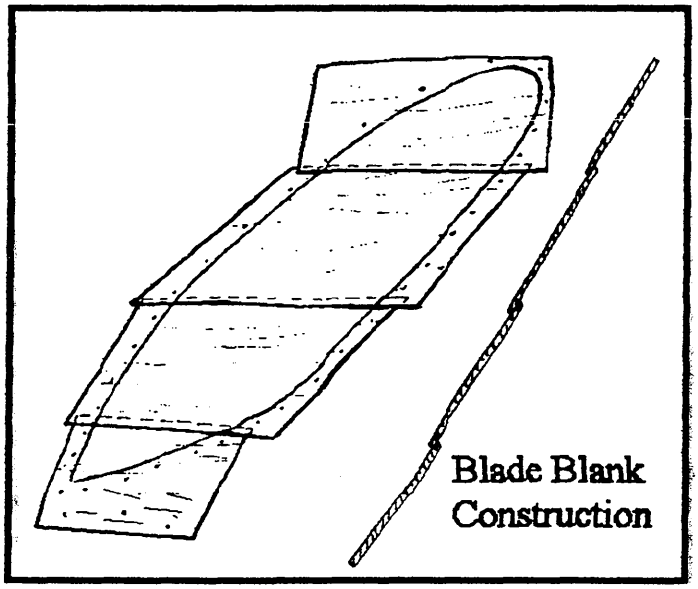
Prop Shaft and "S" hook

Blades - If at all possible, order .008 C grain from Indoor Model Supply. It's difficult to find good C grain at a hobby shop. If you want to use hobby shop wood for the

prop you must choose the lightest piece of C grain 1/32" balsa that you can find. You can't use 5# wood and expect the prop to weigh .17 grams. The EZB will fly OK with a heavier prop, but the performance will fall off quickly with every bit of extra weight.

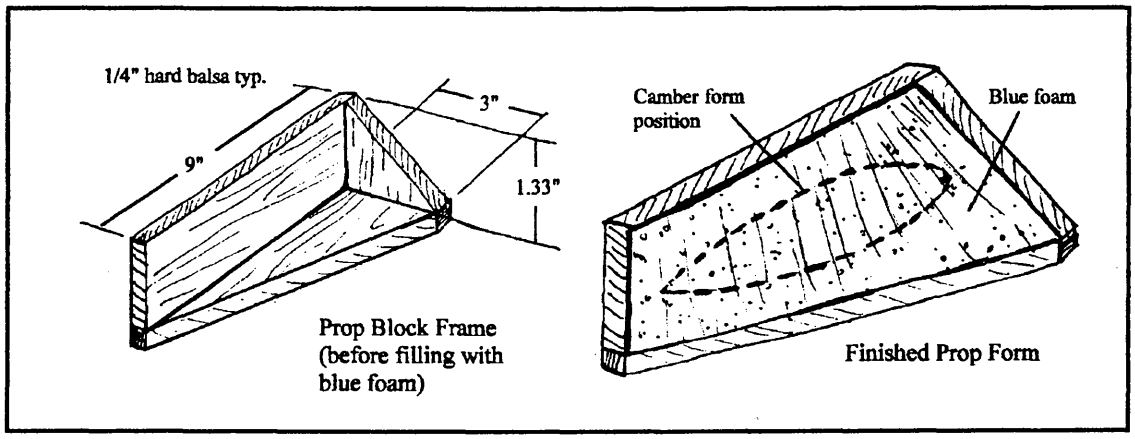
Blade Construction - The blades are assembled on a 4"x10" piece of the green cutting mat from the fabric or stationery department of Wal Mart. My prop blade template is cut from thin aluminum flashing material (available at any hardware store). Diagonal lines are drawn on the template to indicate the overlap. Place the tip of the template over one end of the balsa sheet. Outline the tip with a series of dots 1/8" away from the template. Move the template tip down the sheet and outline the tip again. Do each section two at a time. The reason for placing the two sections together is in hopes that the grain will match as closely as possible. After the pieces are cut out the first tip (A) goes with the first center section (A) and so forth. The sections are glued together so that the diagonal joints face the hub and toward the front of the spar. The tip will overlap the center section, and on down the line. Each overlap is about .025". Use very thin ambroid and lay a thin line of glue along each face to be glued. When dry, lay the tip over the center section .025". Hold the two sections together on the mat and run a small brush loaded with acetone across half the joint. After 10 seconds, slightly rotate the two sections so they won't stick to the mat. Now do the other half. Do not use any more glue or acetone. Repeat this process on the remaining sections.





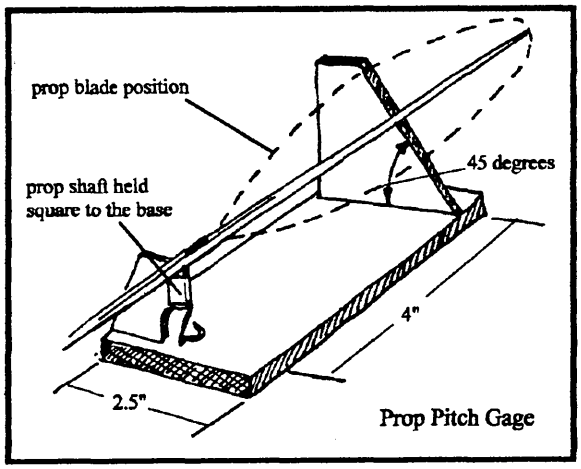
Place the glued prop blades in a heavy book and press overnight. The next day, lay the blades, stacked on top of each other, on the green mat. Make sure that the diagonal lines match up. Lay the metal prop template over the wood. Use a new razor blade and cut along both sides of the template. As you come toward the tip make small straight cuts instead of trying to get the blade to follow the sharp curve of the tip. Work around the tip and rotate the mat as you go. If the cuts are small enough, you will have a perfect curve, and no sanding will be needed. Weigh and record the weight of both blades. Draw a spar line on the back side of each blade where the spar will be placed. This can easily be done by stacking the blades together and pricking the wood with a straight pin. Place a straight edge along the two small holes, and draw in the line with a very thin tipped marker. Do not use a sharp pencil or an ink pen as this will damage the thin balsa.

The thin blades need camber to help retain their shape. To get camber into the prop blades a camber form is made from 3/32 soft balsa. The camber form is made by taking the prop blade template and cutting it 1/8" larger than the template . From the hub to about 2/3rds the length of the form the thickness is 3/32". Taper the last 1/3rd to .045" at the tip. Sand an airfoil into the form leaving the leading and trailing edges .020" thick. From about one inch from the hub up to the hub the camber fades to nothing. The edges will get thicker than the .020" from the one inch point to the hub, where they will be 3/32" thick. Hold the form at different angles to the light and check for depressions or flat spots and use sandpaper to adjust as necessary. Soak the form in cool water for 30 minutes and then place the tip of the form 7" from the center of a 26" pitch block.



Wrap with an Ace bandage to hold the form to the block and allow to dry. After the form has dried soak the blades in cool water for about 15 minutes. Float one blade over the other while they are still in the water and line up one edge. Remove from the water and stack the wet blades on the camber form, and again place the tip end of the form 7" from the end of the pitch block. Use the prop template to cut a cap from 1/32" balsa to protect the blades from the Ace bandage. Run water over cap for a few seconds, and place over the blades on the camber form. Wrap the pitch block , form, blades, and cap with the Ace bandage. Let the blades air dry for two days. To separate the blades once they are dry, place a single edge razor blade between the two blades and run the blunt edge of the razor blade carefully around perimeter of the prop blades.

Prop Assembly-Take the prop spar and place it on the pitch gauge. Make a prop stop from scrap balsa and tape it to the top of the gauge at the 7" mark.



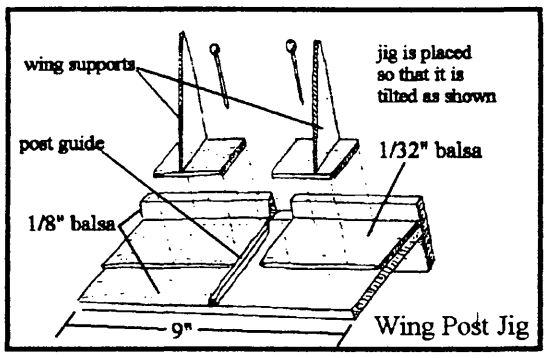
Move a swing arm lamp directly behind the gauge next to the base. When the blade is placed close to the spar the light will show the exact position of the spar through the blade. Do not use Ambroid or other cellulose cements. The pitch will change as the glue cures because cellulose glues shrink too much. Use thinned carpenters glue. The 45 deg. protractor at 4" will give a pitch of 25". Have a blade ready and place a small amount of glue at the hub, the center, and the tip of the prop spar. Immediately move the blade to the spar and attach the hub first, then attach the tip. The tip should be next to the stop. Reach behind the blade and press the blade to the center section of the spar. Check to see if the spar is on the reference line drawn on the blade. Adjust now if necessary. After 10 minutes, remove the spar and place two dots of glue between the hub and center of the blade. Two more between the center and the tip. Place the spar back on the gauge and make sure that both edges of the blade touch the protractor at the 4" mark. If one of the edges is higher than the other, the spar can be tweaked, gently twisted to get the blade to touch front and back. Wet the spar by the hub

and tweak it past the desired pitch. After a few adjustments it should hold the position. Attach the other blade the same way. The prop is now complete.

Final Assembly

Fin - The motor stick and boom should be attached and straight in line with each other. Glue the fin to the left side of the boom, 1/16" in front of the stab. The stab is installed later.

Wing Posts - Before the wing posts are installed cut a step at the top of each post. Cut the step 1/32" deep and the depth of the wing spar. Bevel all four faces at the other end of the wing posts. Place the paper tubes on the posts and make sure that they fit snugly. This is important!



Wing Post Jig

Wing Assembly Jig - The wing assembly jig is used to correctly position the wing posts while they are glued to the wing spars. The post guide holds the wing post square to the spars while the wing supports hold the wing square to the face of the jig. (see drawing)

After the glue has set on the wing posts and paper tubes, install the wing on the motor stick. Place 1/32" positive incidence in the wing. One final adjustment needs to be made to the wing. Loosen the glue joint at the rear wing post where it meets the rear spar with acetone. Put downward pressure on top of the right rear spar several inches from the center rib. You want 3/32" wash in (rear spar down) on the right wing panel. This will slightly wash out in the left panel. Place the model in a stooge and support the wing until the glue has set. This model will not fly properly unless this adjustment is made.

Stab - Glue the stab to the boom with thinned carpenters glue. The stab is glued onto the boom with the left tip about 3/8" high. This is called "stab tilt" and is used to make the model turn to the left. The stab should be flat , or with a slight amount of wash in on the left panel . Warps can easily be removed during assembly by placing downward pressure on top of the L/E spar by the center rib while supporting the boom with your thumb. This adjustment is done on whichever side of the stab that needs it. Hold or support the stab until the glue sets.

Set up & Trim

Final check - Before the model makes its first flight you need to make sure all the components fit together properly. Make certain that the wing posts fit snugly in the paper tubes. The side walls of the paper tubes must be stiff. If they are not the models flight pattern will be erratic. To fix loose or weak tubes use a bit of ambroid on the outside of the tubes. If this doesn't tighten the tubes enough then use a very small amount of glue to coat the inside of the tubes. Check the thrust bearing for 2 degree of left thrust as per plans. The wing must be washed in on the outboard panel, with 1/32" positive wing incidence. Make sure that the wing is less than 18" in span and the chord is slightly less than 3" wide. Re-check the prop for 25" of pitch. The stab should be 3/8" higher on the left side. Finally, the motor stick and tail boom should be straight in line with each other.

I am going to assume that you have no experience in trimming an indoor free flight model. Duration models fly to the left in a nose high flight attitude. We help the model turn left by tilting the stab so that it is higher on the left side. The prop thrust bearing is offset about 2 degrees to the left. Offsetting the rudder is not very effective and so it is not used on this model. Stab tilt and thrust offset are more effective. Next, the model must fly nose high, just under the stall, for maximum duration. This slows the model and also slows the rotation of the prop. Negative incidence in the stab is what causes the model to fly nose high. A really good tail boom will naturally flex to give the needed negative incidence. Here is an easy way to test the stiffness of your models tail boom. Hold the assembled model by the front of the motor stick. The prop does not have to be on the model. Lift the model vertically about 3" and then push it back to its original position. Repeat this procedure several times. This will load the stab and boom. A fairly stiff boom will flex up and down about 2 inches and a floppy boom will flex 5 to 6 inches. Now rotate the model gently on its roll axes from side to side. The wing and stab will follow each other on a stiffer boom. On a floppy boom the stab will twist one way while the wing twists another. In my opinion the tail boom is one of the most important components of an EZB. Its importance doesn't usually show up until the motor is really torqued up. My design has the wing mounted very close to the front of the motor stick. This makes for a longer tail moment arm and moves the center of gravity behind the trailing edge of the wing. This makes the stab carry a larger portion of the load. This is evident by the upward flex induced in the stab during flight. When the stab is loaded, the boom also bends upwards. The more power that is loaded into a motor the greater the boom will bend. If the model has a floppy boom it will stall or flounder around until the torque drops off. When the motor stick and boom match, the model will perform smoothly throughout the entire usable torque range.

First flight - Set the model up with 1/32" positive wing incidence. Tie up a loop of rubber .033" X 10". Wind in 300 turns and place the motor on your model. Go to the center of the floor. Hold the model about eye level, with the nose of the model slightly elevated. Release the prop and gently push the model forward. The model should circle left in a 20' to 25' circle. If it stalls, move the front wing post down slightly. If it dives, relaunch and make sure you launch with the nose raised. If it still dives make sure that you still have 1/32" incidence in the wing and check to see if the model has too much down thrust in the bearing. Increase the wing incidence another 1/32", but no more than 1/16" over all. If the model needs more than this you should tweak the tail boom to help get the nose up. This should correct any diving.

With 300 turns in the motor a .6 gram model should maintain level flight. A slightly heavier model (.75 g) will probably not maintain its height, but it should come close. When the model flies without stalling, check the circle. If the circle is greater than 25', twist the tail boom so that you have more stab tilt. Do the opposite if you need a wider circle. Hopefully your model will be flying with a nose high attitude. If not, an adjustment has to be made to the tail boom. If you had more experience I would suggest sanding the boom slightly so that it would flair. Lets do it an easier way for now. Starting about 3" behind the rear hook, bend the boom upward about 1 degree. 1 degree puts about .1" negative incidence in the stab. Wet the area where the bend is to be with saliva and be careful. Don't apply too much pressure as the boom may break. Rewind the motor and check for the 25' circle and a nose high attitude. If the model is doing both, start adding turns in the motor in multiples of 100. Do this until the model starts bumping the ceiling.

You could continue adding turns, but there is a possibility of damaging your model. Depending on your flying site, you now have two choices. Experiment with different rubber sizes and launch torque, to get the most out of your model, or start flying on quarter motors.

If done properly, quarter motor flying under a low (25') ceiling can accurately predict the time your model with do in a high ceiling. A 22' to 26' site is a perfect place to get ready for contests with ceiling heights of around 120'. If you decide to use quarter motors measure the distance from the rear hook to the back of the prop hook. Make a dummy motor 3/4 the length of your measurement from .015 wire. Wrap thread 1.5" on each side of center and apply a light coat of CA. This give a place to add ballast and to hold on to when the motor is torqued up. The prototype performed well on a 3" loop of .033" tan II. To get the motor off the hook on the winder without loosing turns an "O" ring is used. This is a very small plastic ring through which the motor is threaded before it is tied. These rings are made from thin slices (.025" to .030") of the plastic stick found on the cheapest Q-tip copies. Use one 0 ring on the front end of the 3" loop.

You need a reliable way of balancing the quarter motor and dummy motor. **The dummy motor must weigh three times what the rubber weighs**. This is important. You can use a portable scale or build a quarter motor balance beam. See plans for my balance beam. Each time there is a change to the weight of the motor, you need to add or remove weight from the center of the dummy motor . Non drying clay sold at toy and art supply stores is good for adding weight to the dummy motor.

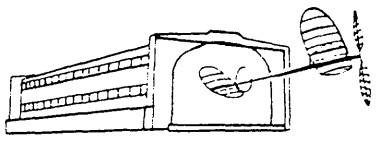
When flying on quarter motors the model and the prop need to be released at the same time. The torque drops off quickly on a quarter motor once the prop stars to turn. You can't tell if the model will handle the torque that is loaded on the model if turns are allowed to spin off before the launch. If your model stalls on a quarter motor it will certainly stall on a full motor.

I'll give you an idea of what the prototype looked like when loaded with .13 inches oz.of torque.. Hold the wound model in front of you, and sight down the motor stick to get the proper view. The wing was flat with no warps in either wing panel. The motor stick and boom were bent downward in a slight arc. The stab had lost some of its tilt but was still high on the left side. This torque was more than enough to get to the 116 foot ceiling at Johnson City.

One last bit of information on motor sticks. If your model stalls at a high launch torque and you think the boom is OK the problem could be with the motor stick. It might be to strong. The model will fly great on low to moderate torque, but stalls when released at the desired launch torque. Try this. If the model stalls at .12 inches oz, wind to .15 inches oz. and relaunch. If it climbs 4 to 5 feet higher then stalls, the motor stick is probably too stiff. To make certain wind and launch at .18. If the model climbs to around 20 feet before stalling the motor stick is definitely too strong. Take a sanding block and sand the bottom of the motorstick from the rear post tube to one inch in front of the rear hook. Be careful and only make a few strokes with the paper and make another flight. Its extremely easy to remove too much wood and ruin the motor stick. Relaunch at .12 in oz of torque. to check if you have removed enough wood. When the stalling at this torque goes away stop sanding the motor stick.

Good Luck !! Larry Coslick

EAST COAST INDOOR MODELERS
1931



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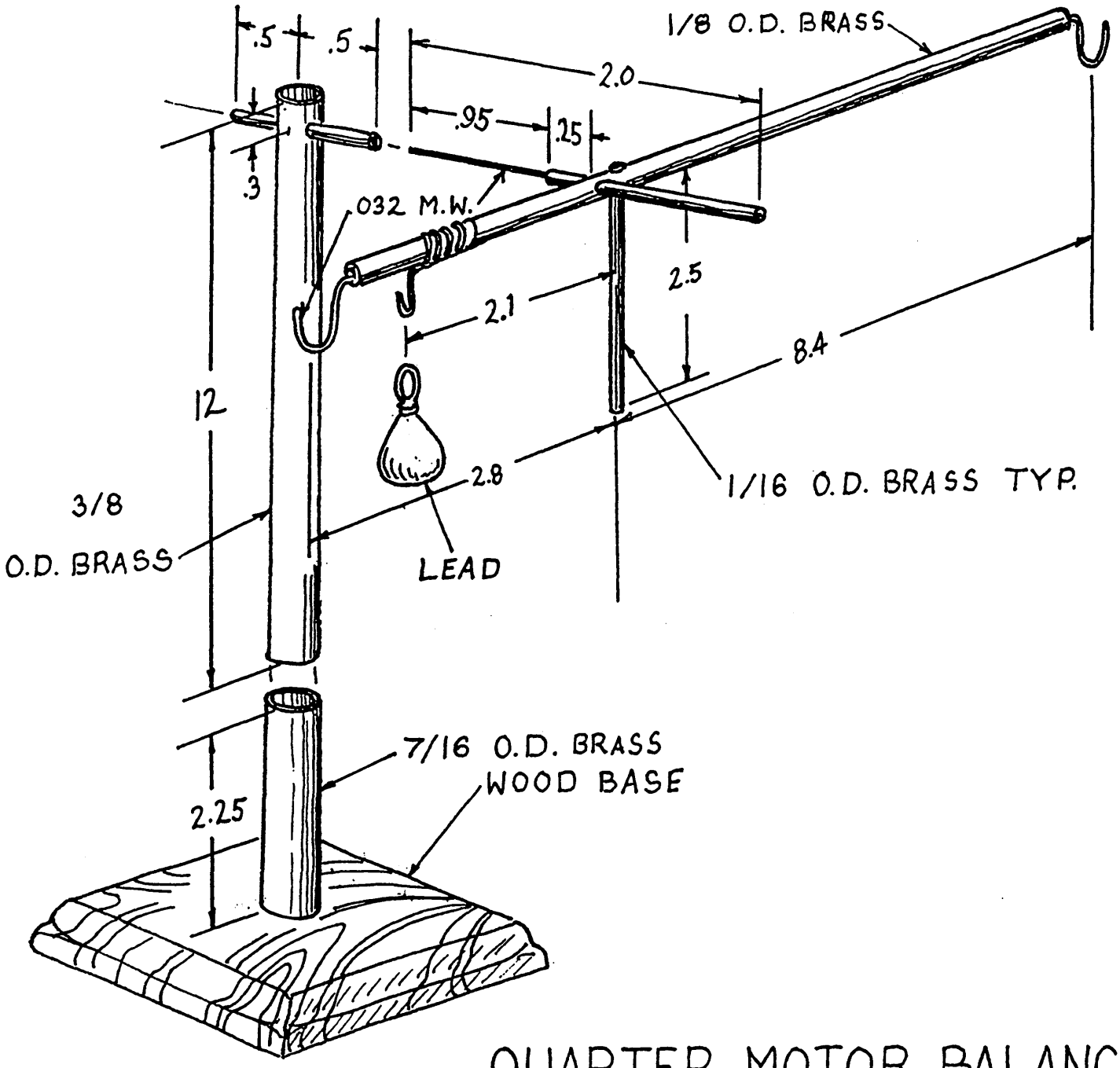
July 4th Pete Andrews Contest	*4 Days*	*July 3, 4, 5, 6*
Labor Day Weekend Contest	*4 Days*	*Aug 29, 30, 31, 1st*
FAI U.S. Team Regional Contest	*3 Days*	*July 4, 5, 6*

NOTES:

1. SILVER SOLDER ALL METAL JOINTS
2. ADJUST LEAD WEIGHT FOR STATIC BALANCE



QUARTER MOTOR BALANCE

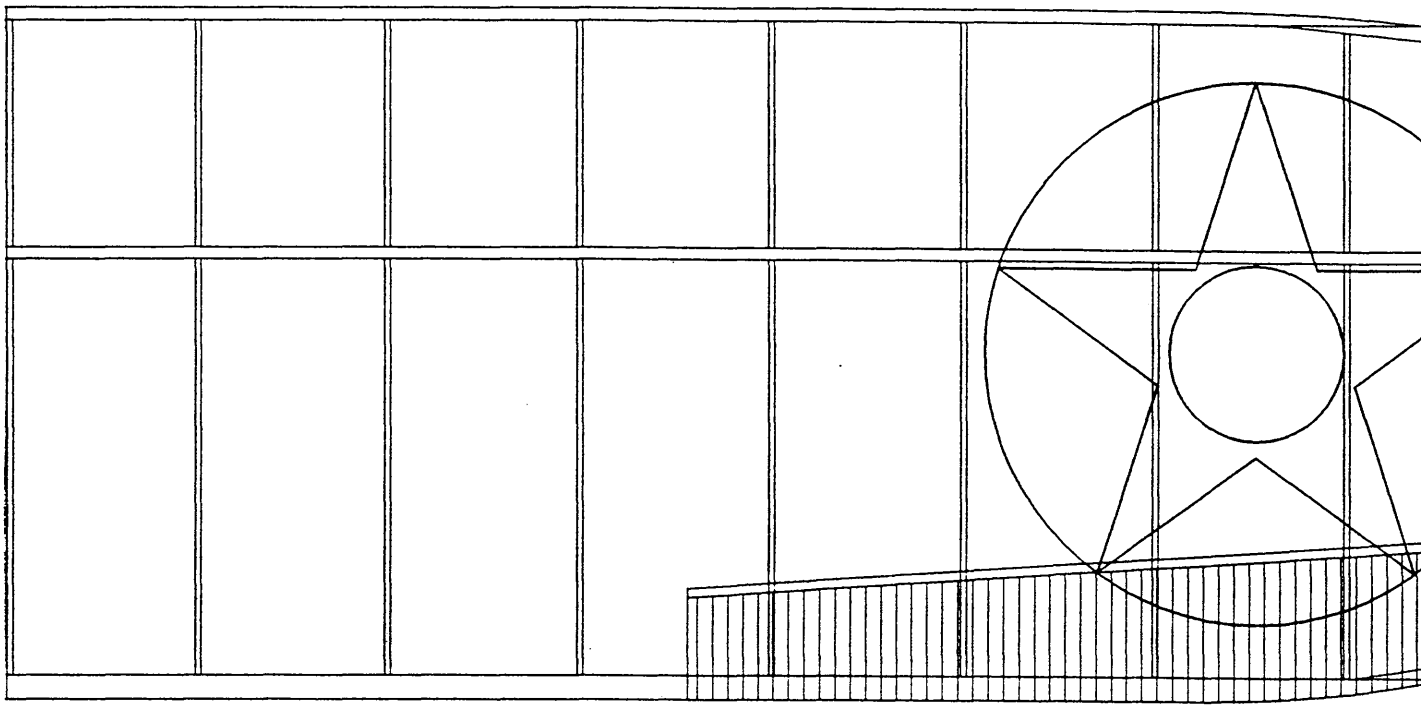
DESIGNED BY LARRY COSLICK
DRAWN BY STEVE GARDNER 11/5/96

Tool and Source List

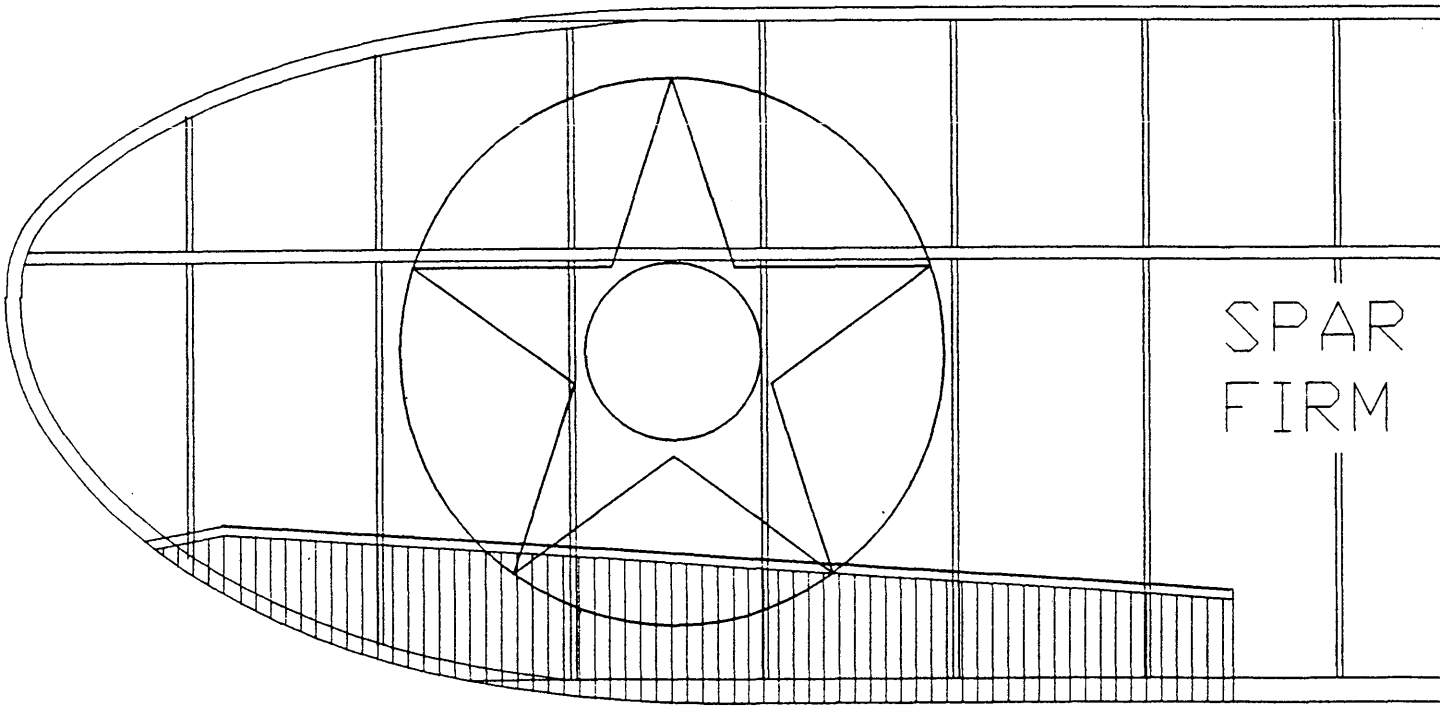
Indoor Model Supply Box 5311, Salem, OR 97304 Owner Lew Gitlow Complete line of indoor supplies Plans, Wood, Kits. Cat. $ 2.00	Good source for prop pitch gauges, wood, beam scale and Ultrafilm
Jones Manufacturing 36631 ledgestone Mt. Clemens, MI 48043	Balsa stripper and prop jigs
Oppegard Mfg. 140E. Golden Lake Lane Circle Pines, MN 55014	Rubber stripper
Harlan Mfg. 15 Happy Hollow rd Wayland, MA 01778 Owner: Ray Harlan	Ultrafilm, scale, balsa stripper, rubber stripper prop bearings
FAI Model Supply Owner : John Clapp PO box 366 Sayre, PA 18840-0366 1-717-888-0997	Rubber (tan II) catalog $1.50
Wilder Machine Works 1005 Hidden Oak ct. Colleyville, TX 76034	Indoor Rubber Winder
Superior Props 2412 Tucson Ave. Pensacola, FL 32526 1-904-944-1972	Prop blocks and forms
Micro-X Box 1063 Lorain, OH 44055	Complete line of indoor plans and supplies Catalog $1.50

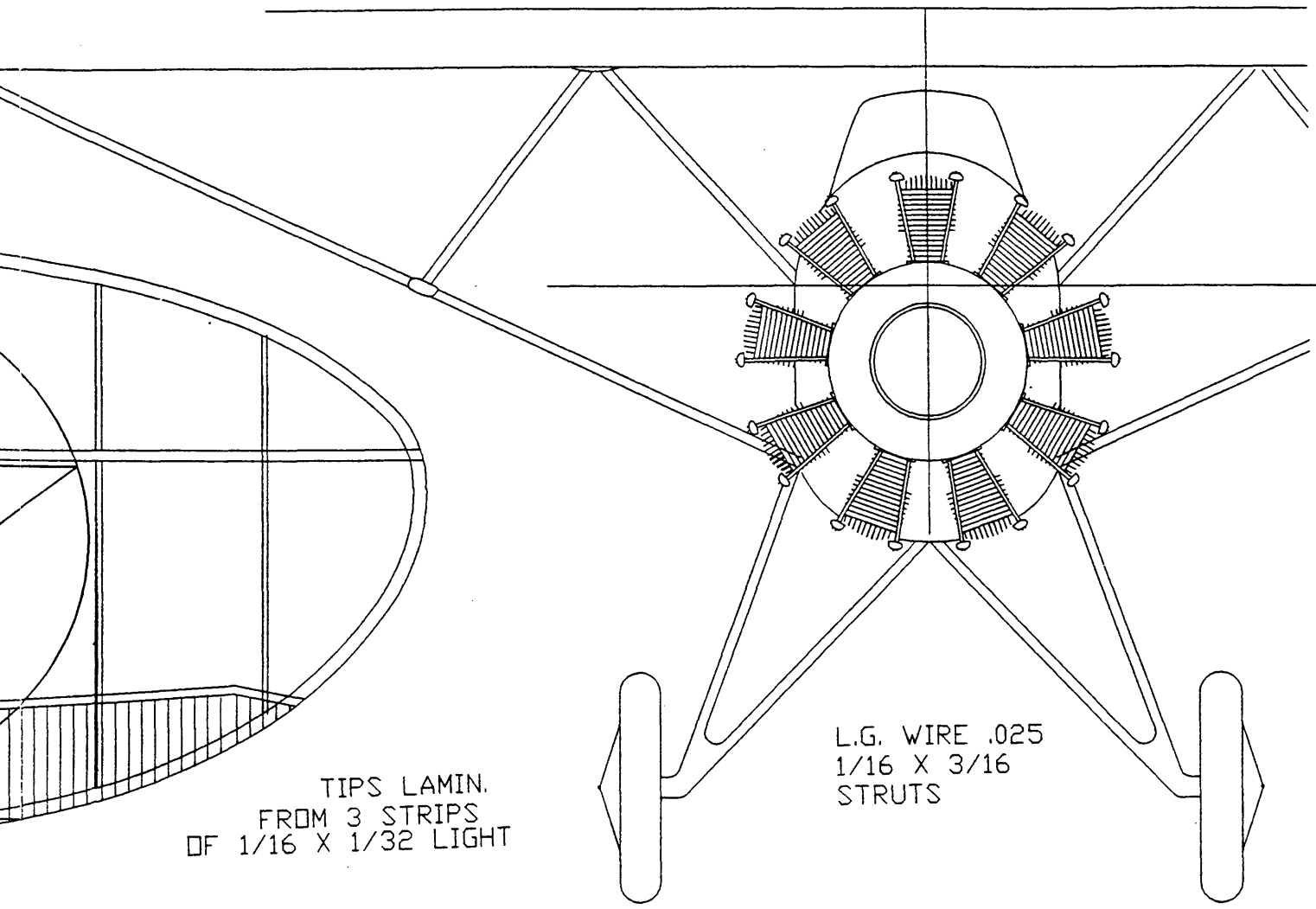
RIBS 1/32 SHEET, MED LIGHT

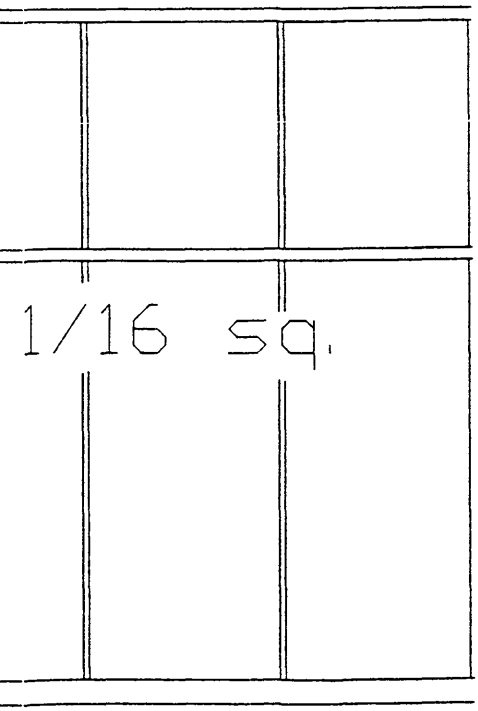
L.E. 1/16 X 1/8



T.E. 1/16 X 1/8

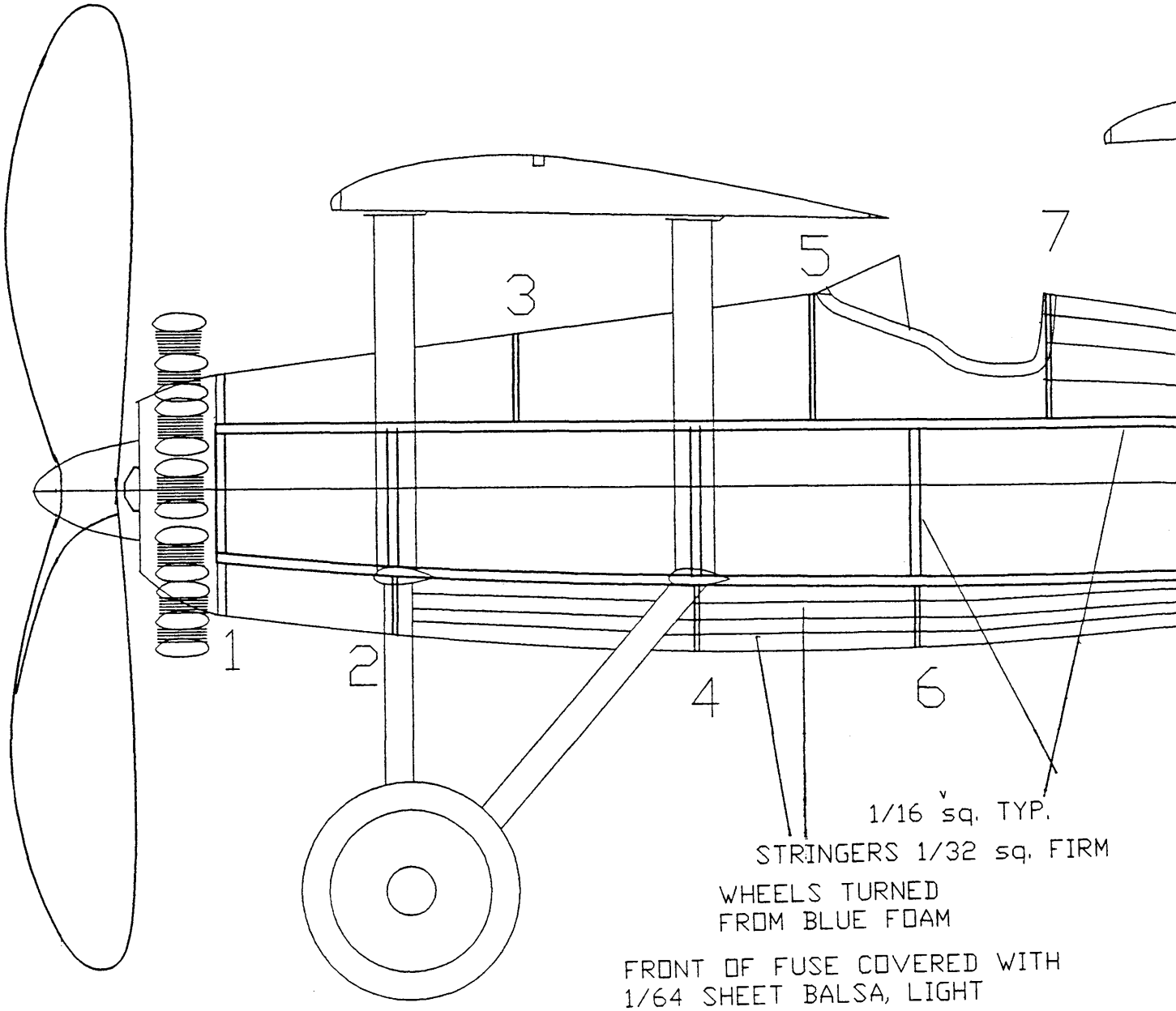


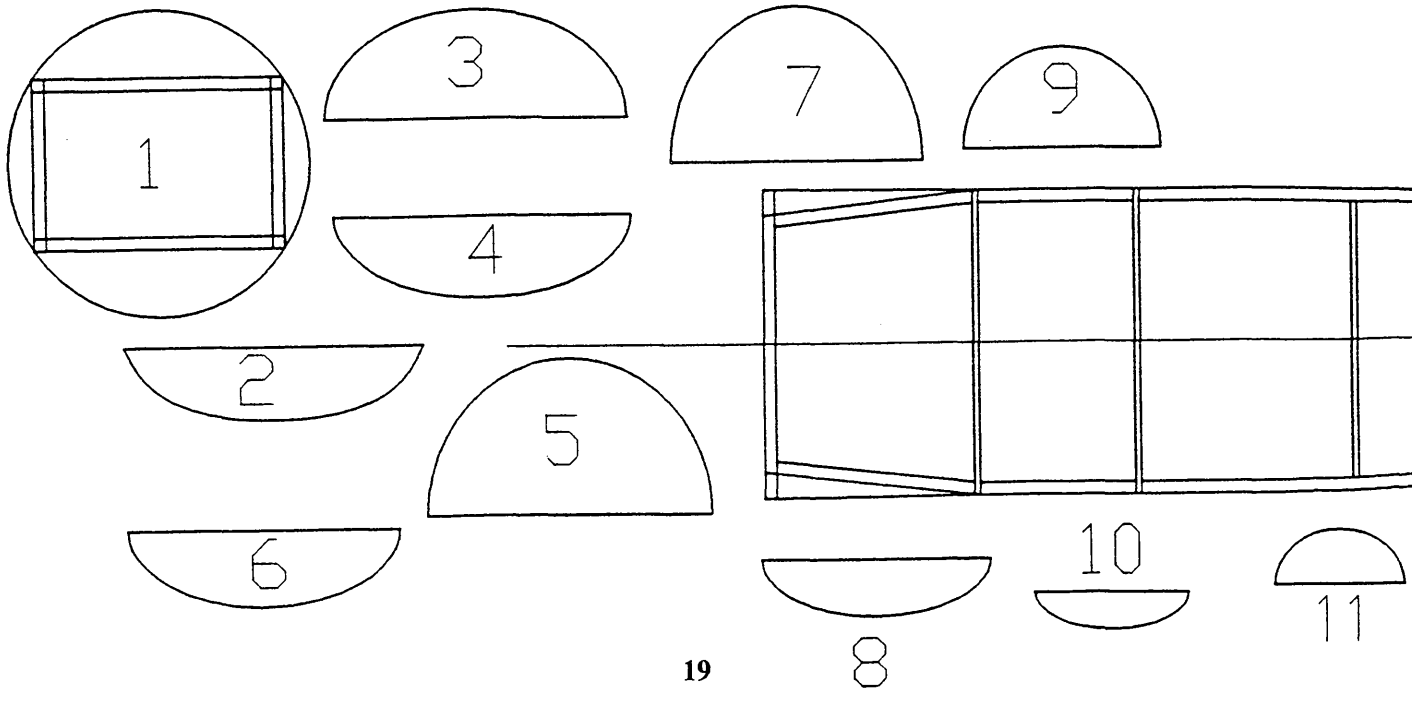




ENGINE MADE FROM BALSA CYL.
WRAPPED WITH THREAD, WIRE PUSHRODS.
BUILD STRONG FOR NOSEWEIGHT

BOEING MODEL 202
(ARMY XP-15)
RUBBER SCALE MODEL
by STEVE GARDNER


1
2
3
4
5
6
7
1/16 sq. TYP.
STRINGERS 1/32 sq. FIRM
WHEELS TURNED
FROM BLUE FOAM
FRONT OF FUSE COVERED WITH
1/64 SHEET BALSA, LIGHT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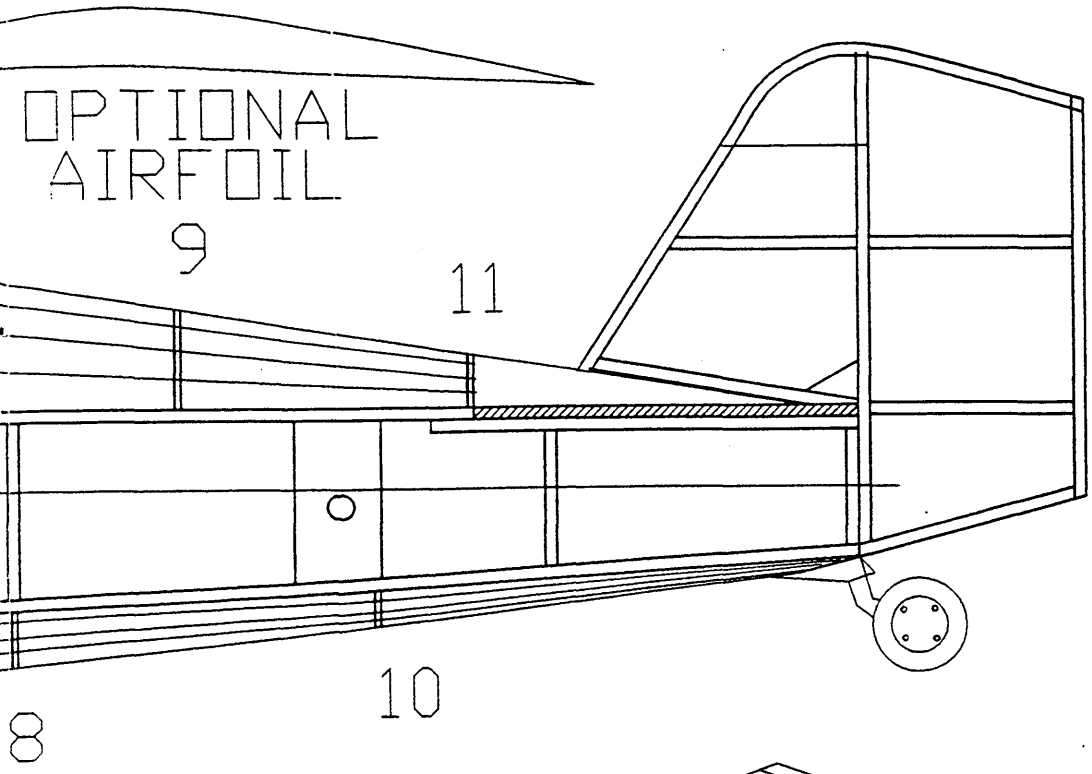
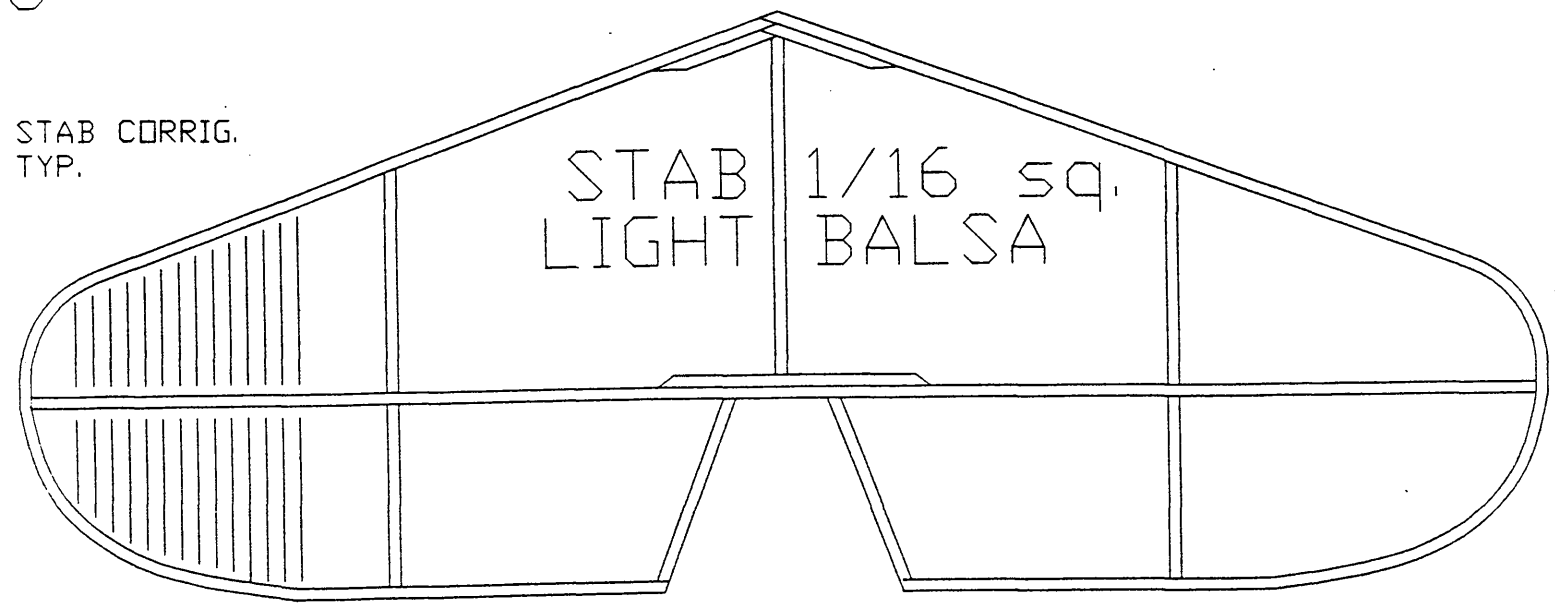
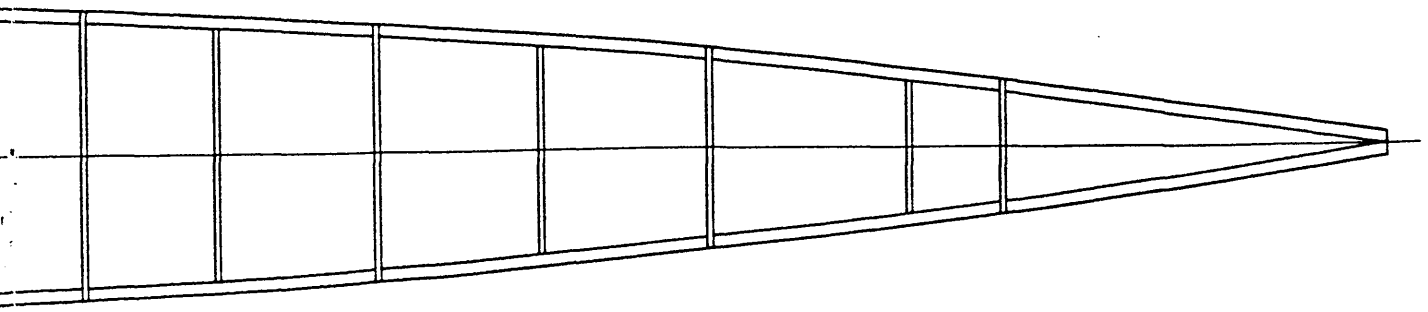
11

ALL FORMERS 1/32 MED.



POWER
1/8 X 14
TAN II





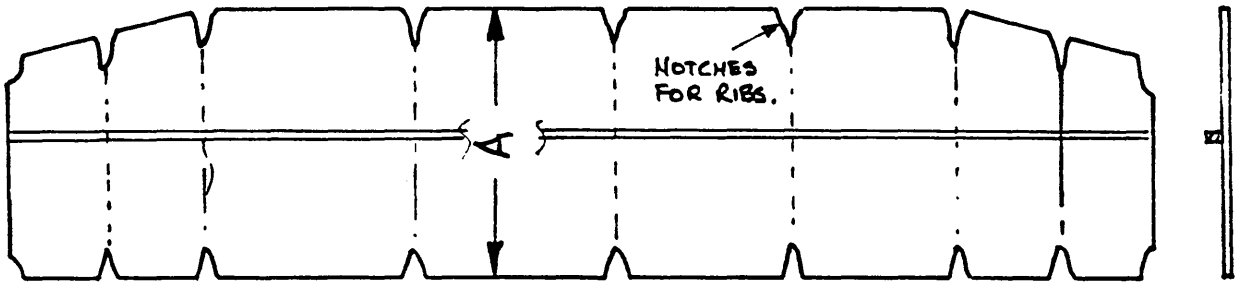
MY WAY - Part 1 by John Barker (of Georgia)

This article is intended for those who have never built a duration type indoor plane, are convinced that they can't, but don't realize that, with a little help, they CAN.

Where to start ? My preference is the Limited Pennyplane (Most of my friends still call it a Novice Pennyplane, and so do I). get a plan of a successful plane e.g. Banks Pennyplane or copy a model of a club member. If you don't have a building board try a piece of plain ceiling tile. Buy sharp dressmaker pins. You need some good quality cardboard for templates; I bought a sheet of picture matt material from Michaels, a local general handicraft store that also frames pictures . Any light color is O.K.

The Wing.

Draw and cut out the wing outline template. It will look something like this:

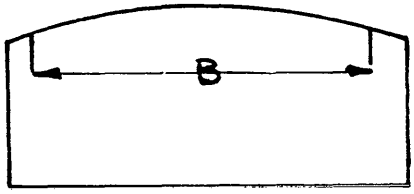


Dimension A is important. The completed wing must not exceed 5.0 inch chord. Lets assume that the L.E. and T.E. are 1/16 sq. (medium). Lightly sanded assume .06 in.

Make Dimension A = 5.00 - .06 -.06 -.04 = 4.84 in.

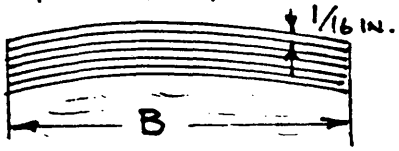
The .04 is insurance against exceeding 5.00 in. finished chord . The spar is to stop the d--- ribs falling over and to stiffen the template.

Draw and cut out the wing rib template. Mine look like this:



The two marks are the ends of the completed rib.
Make dimension B a hair more than dimension A.

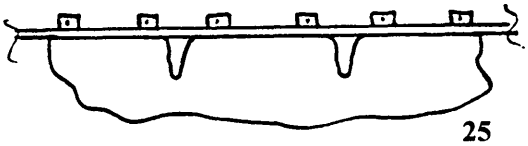
Ribs. Get your rib material . probably 1/32 medium light sheet, and cut a piece length B (a hair more than A) off the end of the sheet. Both ends of this cut must be clean cuts. Use the template and a sharp razor blade (not a balsa knife) to slice off ribs that look like this:



Eye ball the 1/16 in.

Some ribs may be deeper than others. Save these for the dihedral joint and center ribs.

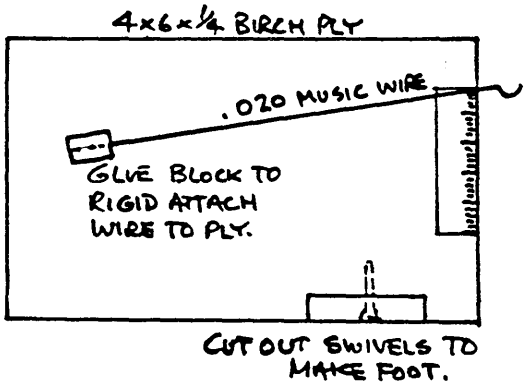
Assembling the wing. Put the usual wax paper etc. on the board and pin the wing template securely down on top of it. Make sure that the board is flat. find some old medium soft 1/8 x 1/16 strip. cut off a zillion little blocks about 3/16 in. long. Use these with pins to fasten the L.E. and T.E. against the template like this:



Do NOT push the pins thru the structure OR against one side of it.

Now insert the ribs in place. If you made B a hair more than A , they will be a nice snug fit. The dihedral ribs should canted inwards by about half the dihedral angle. Use Cy glue (not the thin stuff) or acetate glue, put a tiny drop on the end of a tiny screwdriver (or similar 1/32 across) and apply to each rib joint. When dry remove all the pins. When doing this stick a finger on the structure so you don't lift it with the pins. Pry the wing structure off the template with a lot of patience and a few well chosen words ! With the wing finally free you will be appalled at its floppiness (technically called low stiffness). Don't worry , compared with an EZB its like iron !!

Weight recording. you should get in the habit of weighing parts as you go along. You can jot them down on the wing template. Do not rush out and buy expensive scales. I made one like that described in Ron Williams excellent book (Alas,not available). It looks like this:

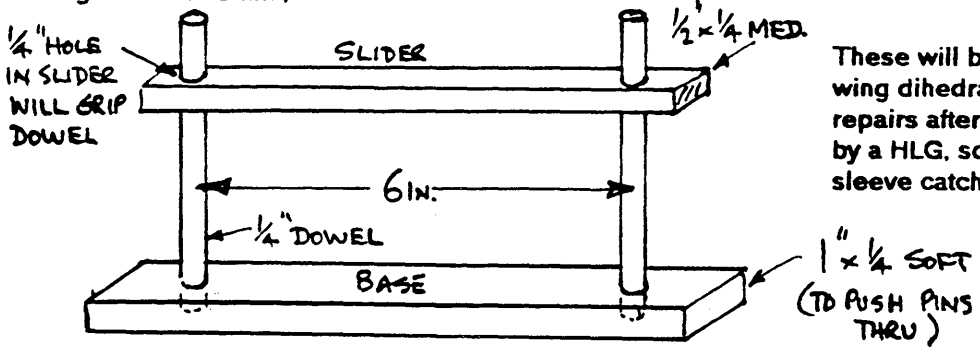


When finished you must calibrate it. A NEW penny weighs very close to 2.50 grams. The old copper ones were 3.1 grams , from which the Pennyplane gets its name. Use a very small piece of thread and sticky tape to hang the new penny on the wire hook. Measure EXACTLY how much the wire deflects at the edge of the wood (C in.). Remove the thread and tape and Hang this on and measure the deflection (D in. not much).

Make a paper scale C - D in. long graduated linearly from 0 to 2.5 and paste it along the ply edge. Tweak the wire if necessary to sit on zero. The use of a linear SCALE (equal length divisions) is not quite accurate but will do for now until you can locate some accurate 0.50 gram weights. Beware , some mail order weights are way off. Like I said , weigh the bare wing and later covered. Do this for every part of the plane. For future models this will indicate where you need to reduce weight or add material for more stiffness.

Stabilizer and Fin. The method is similar to the wing construction. Should be a breeze , except that you may be using thinner Wood.

NEXT MONTH. Covering with plastic film. In the meantime make a couple of wing stands like this;



These will be used for setting up wing dihedral, and for on the field repairs after you get clobbered by a HLG, some other clod, or your sleeve catches a wing tip !!!

MY WAY - Part 2 by John Barker (of Georgia)

COVERING - IT AIN'T EASY (UNTIL YOU'VE DONE A FEW)

INTRODUCTION. By now you should have built your Novice (Sorry! ' L i m i t e d') Pennyplane wing and tail feathers. If not. GO to PART 1 and do it ! For the good guys, you should cover your indoor duration plane with one of the modern plastic films. These vary from .000060in. down to around .000023in. One supplier quotes .000006in.(6 millionth's) which I find hard to believe ! Any of these will be OK, but you may find the thicker stuff easier to handle . I buy mine from Wayne Trivin and Dick Obarski. It comes in 15ft. rolls . Expect to waste quite a bit with your first attempts to use it.

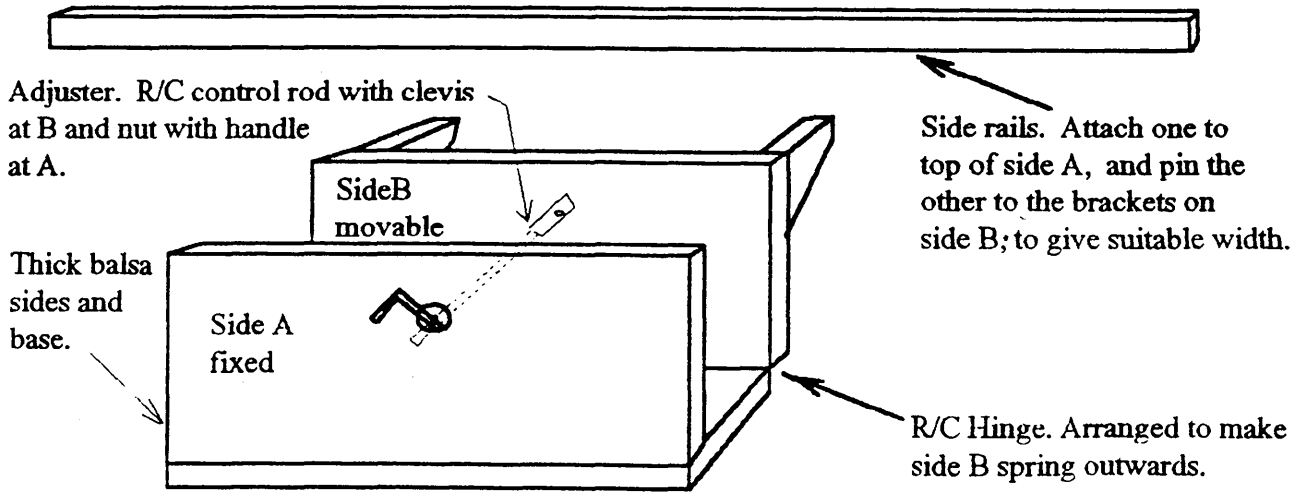
Covering with this type of material is totally different from Jap tissue or condenser paper. It has no inherent stiffness and is full of static. If you let go of a piece it will collapse into a heap like Handi-Wrap only worse. From a strength point of view its a bit like cellophane. Once you have something covered , it is surprisingly resistant to puncture, but if you get a tear started then watch out !

Let's cover the Pennyplane wing and tail which you built last month along with the pair of wing supports. The covering sequence will be :

1. The wing and tail must be flat with no dihedral.
2. Construct a film mounting frame.
3. Mount the film on the frame.
4. Place the wing (or tail etc.) on the framed covering .
5. Adjust the frame to roughly match the rib contour.
6. Apply adhesive.
7. Trim the covering thus cutting loose from the frame.
8. Add dihedral and remove the resulting slack.

You may read articles which describe different covering sequences, but start with my way and you will be less likely to get into a mess. But do experiment later. Now for details.

FILM FRAME. First construct a lightweight rectangular frame whose inside edge is <u>at least</u> 6.5x20in. However you fashion this frame ,it must be flat to start with and have stiff spanwise sides. With the film mounted on the frame, you must be able to introduce slack by pulling the sides together. This will let the covering conform to the rib contour. One way to achieve this is to have bendable end pieces made from aluminum wire or possibly strips cut from a soda can. Another rather more complicated method which works great is my way. This uses a screw adjustable gizmo that looks like this:

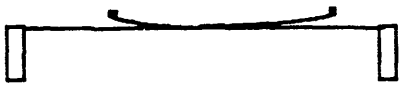


The hinges are essentially flat pieces of nylon. Arrange them to make the moving side to spring outwards. The top rails are hard balsa or spruce etc. The rail on the moving side can be pinned to the side B brackets to allow different frame widths for other models. The idea of this contraption is that the film slack can easily be adjusted by turning the handle. It is a bit cumbersome, but it works fine.

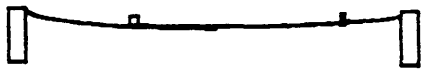
MOUNT THE FILM. Use a slightly damp cloth to wipe off your work board. When dry, lay the roll of film down at one end and start to unroll it. don't worry if it starts to cling together, but be very careful NOT to start a tear. With a brand new razor blade cut off a piece at least 1in. larger all round than your frame. Go slowly because the razor may snag in the film and tear it. Roll up the remaining film and stow it. Now pick up your cut piece and wad it up (you heard !) real tight. Now spread it out again , as flat as you can, on your board. It will have fine wrinkles and less static. fasten it down to the board with about ten little bits of tape and, if possible, tighten it a little at the same time.

Prepare Adhesive. Use any type of contact adhesive, including rubber cement, that can be thinned to a rather watery consistency. I use Elmers SAF-T Contact Cement . This is water soluble. Check building supplies and craft shops. carefully lay the frame , topside down, on the film. Using a small brush apply the thinned adhesive so that it wicks between the frame and the film. Let it dry. Press down on the frame to make sure it adheres to the film. With a razor cut loose the bits of tape and slowly lift the frame and support it right side up.

COVERING. Covering is done with all surfaces flat just as they came off the building board. Do NOT sand cute airfoil type tapers into the L.E. or T.E. ; it will not improve the aerodynamics, but it will weaken the members considerably. Lets start with the wing. Lay it upside down on the film. Introduce slack by bending the frame wire ends, or by cranking the handle of my frame. You need just enough slack so that both L.E. and T.E. sit down on the film thus:



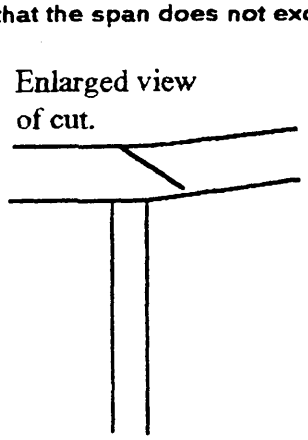
Film tight.

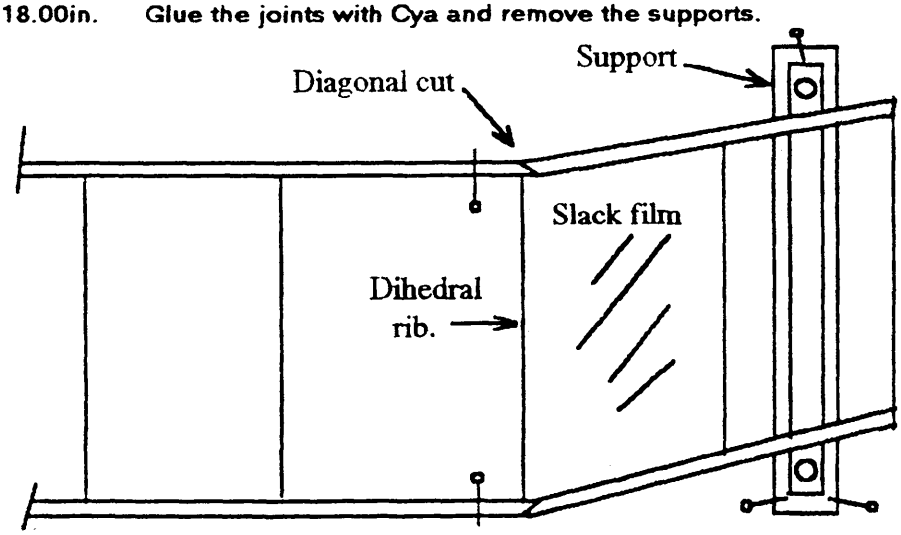


Film slack

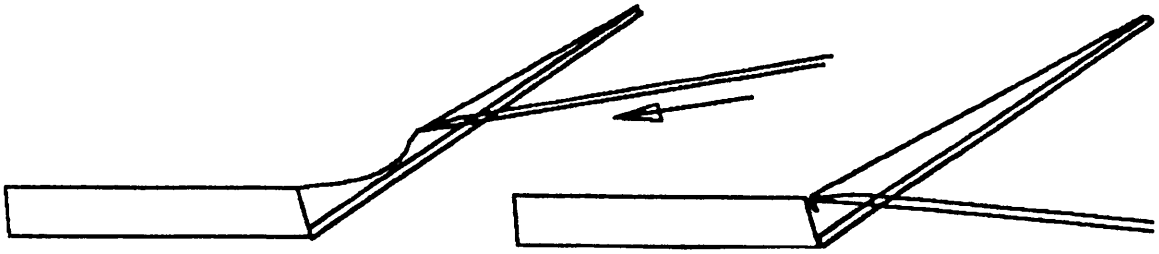
Apply adhesive. With a tiny brush apply a little thinned adhesive to wick in on the L.E. and T.E. at the dihedral ribs. Let it dry. Go around the entire outline and across the dihedral ribs with adhesive, using as little as possible and let it dry. It may be necessary to push down on the structure to make it stick. Now for the fun part! the film must be trimmed all round the outline to cut it loose from the frame. There are two ways. The first is to use a brand new razor blade from which all traces of stickiness have been removed to minimize the chance of snagging the film. The second is to use a hot wire or cautery having first practiced on a spare area of film, being careful not to pause at any one spot since you may burn the balsa or melt a hole in the covering. I have used both methods but I prefer the hot one. Which ever you choose you may want to put something under the wing to support it as it drops.

DIHEDRAL. Fasten the center wing to the board, on wax paper, with pins angled across the L.E. and T.E.. Slice almost thru the L.E. and T.E. at an angle just outboard of the dihedral rib , so that the rib remains attached to the inner wing. Lift the wing tip to crack the spars and prop up on a wing support (you did make the supports I hope!) . Pin the base of the support to the board and raise the slider to give the correct dihedral, plus washout if the plan calls for it. Add pins if necessary to hold the dihedral joints together. Repeat for the other tip and check that the span does not exceed 18.00in. Glue the joints with Cya and remove the supports.



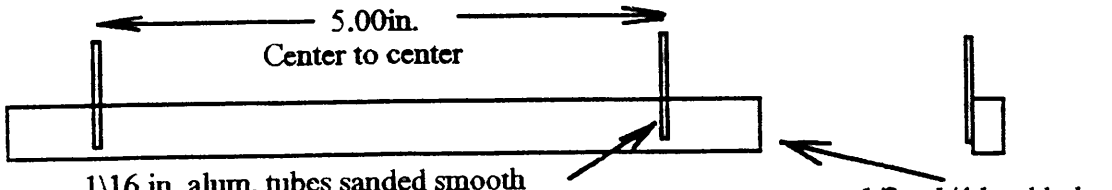


How to get rid of the slack film on the outer wing? Easy. With your fine brush paint a line of thinned glue just outboard (1\32 to 1\16in.) of the dihedral rib. Get a piece of 1\16 th.square and slice the end to look like a chisel. Apply it to the bottom surface about mid-chord and slide it inboard to chase the slack to the rib until a downward tuck forms. The glue should hold it here. Repeat all across the rib until all the slack is gone. If it does not hold, wait until the contact glue has got tacky and try again.



Cover the tail feathers in like fashion.

NEXT MONTH. Prop, motor stick etc., and final assembly. In the meantime make a jig to set up the wing attach tubes to the motor stick like this:



BALSA DENSITY TABLE

For sheets 3 x 36 in. and strips 36 in long.

Table gives weight in grams

Sheets: thickness	Density, lb/cu-ft 4	5	6	7	8	10	12	14	16	K
1/32	3.54	4.43	5.32	6.20	7.09	8.86	10.6	12.4	14.2	1.13
1/16	7.09	8.86	9.43	12.4	14.2	17.7	21.3	24.8	28.4	.564
3/32	10.6	13.3	15.9	18.6	21.3	26.6	31.9	37.2	42.5	.376
1/8	14.2	17.7	21.3	24.8	28.4	35.4	42.5	49.6	56.7	.282
3/16	21.3	26.6	31.9	37.2	42.5	53.2	63.8	74.4	85.1	.188
1/4	28.4	35.4	42.5	49.6	56.7	70.9	85.1	99.2	113.	.141
3/8	42.5	53.2	63.8	74.4	85.1	106.	128.	149.	170.	.094
1/2	56.7	70.9	85.1	99.2	113.	142.	170.	198.	227.	.071
Strip size / No. of strips										
1/16 x 1/16 16 1/16 x 1/8 8 1/16 x 1/4 4	2.36	2.95	3.54	4.13	4.73	5.91	7.09	8.27	9.45	1.69
3/32 x 3/32 8 3/32 x 3/16 4	2.66	3.32	3.99	4.65	5.32	6.64	7.97	9.30	10.6	1.50
1/8 x 1/8 8 1/8 x 1/4 4 1/8 x 1/2 2	4.73	5.91	7.09	8.27	9.45	11.8	14.2	16.5	18.9	.847
3/16 x 3/16 4 3/16 x 3/8 2	5.32	6.64	7.97	9.30	10.6	13.3	15.9	18.6	21.3	.752
1/4 x 1/4 4 1/4 x 1/2 2 1/4 x 1 1	9.45	11.8	14.2	16.5	18.9	23.6	28.4	33.1	37.8	.424

For closer work, or sizes not listed:

Density (lb/cu-ft) = weight (grams) x K

Weight (grams) = Density (lb/cu-ft) / K

K appears in the right column in the table. For sizes not listed, K may be calculated from the formula:

$$K = \frac{3.81}{L \times W \times T \times N}$$

29

where L, W, and T are the length, width, and thickness in inches, and N is the number of pieces.

MY WAY Part 3 STICK & TAIL BOOM ASSEMBLY John Barker (Georgia)

(THEY DO MORE THAN YOU MAY BARGAIN FOR !!)

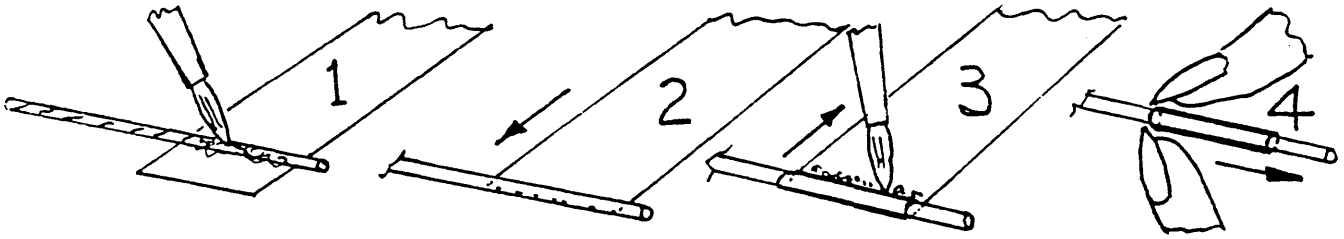
INTRODUCTION If you read Parts 1 & 2 you may by now have ventured into the field of indoor duration. You may also have built and covered the wing and tail feathers of your Limited Pennyplane. together with a jig to position the wing mount tubes on the motor stick. Last month I got carried away and indicated that we would be finished with this article right here. I bit off more than I could chew . so you will have to be satisfied with words of semi-wisdom on the motor stick and tail boom assembly. Why so much space for such mundane items ? Read on.

MOTOR STICK DISCUSSION. The prime function of the motor stick is to support the wing, tail boom, prop and rubber motor. Unfortunately it does more than that !! Lets consider what it does when you wind up your motor :

1. It Bends. i.e. it arches up in the middle due to the tension between the motor hooks. This induces some negative tail incidence and some downthrust. Both of these are quite small for a fairly robust limited pennyplane.
2. It Twists. For the tail this imparts a left tip down tilt , which tries to make the plane turn right (not desirable). For the wing, it twists the left wing L.E. up and T.E. down (wash in) which assists the normal trim for left turn. It also imparts a small deflection in the yawing direction.
3. Both the above will change as the motor unwinds, especially during the initial burst of power.

For early flying .it is easier to trim if the above effects are minimized by keeping the motor stick stiff. bear in mind that a stick of lightweight wood (up to 7 lb./cu.ft.) and generous proportions will be much stiffer than a thinner stick of heavier stock. Enough talk, lets build.

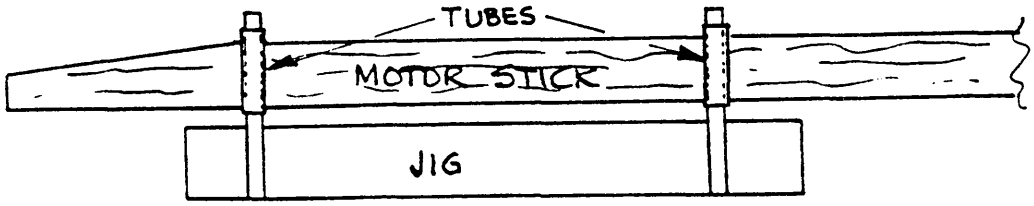
WING AND TAIL MOUNT TUBES. These tubes are made by rolling jap tissue around a mandrel and impregnating with cement. Start with the 1/16 in. inside dia. tubes which carry the wing pylon sticks. Cut a strip of jap tissue about 3/4 in. wide and several inches long. Use the shank end of an undamaged 1/16 drill as the mandrel. Rub the shank end on a candle stub and remove any residue with your fingers. Thin some Ambroid (or similar) about 50/50 with acetone. Lay the tissue flat on the work board and proceed as in the diagrams. At (1) paint the mandrel with the cement. (2) roll back to pick up the tissue. (3) roll forward to start the first layer -- use of the brush will help eliminate any slack -- none allowed here. Continue rolling and adding cement for several turns. Cut off the spare tissue and twirl between your fingers to lay the end flat and tighten the coils. (4) Immediately pull the tube off the mandrel with your finger nails and let it drop on the work board. You will ruin a few until you find it is easy. The trick is getting step (3) O.K. Make several spares



and when dry store them on snug fitting rounded balsa sticks. With an 1/8 drill and tissue about 1 in. wide make the tail mount tube, plus a spare or two.

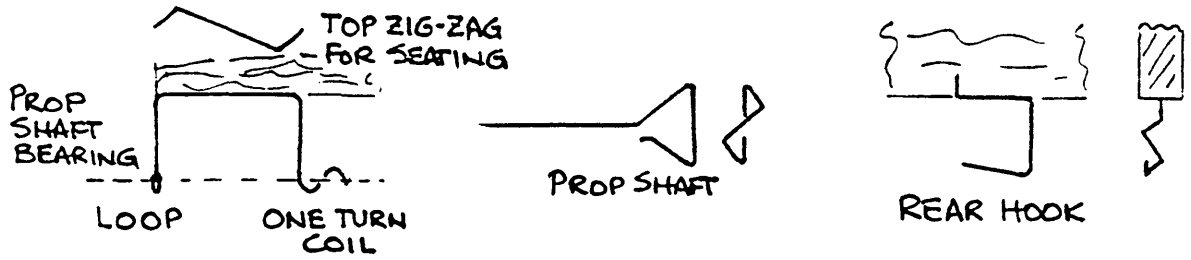
MAKE MOTOR STICK AND TAIL BOOM. Cut the stick and boom per your plan with a bias towards being slightly deeper than shown. When sanding leave the motor stick essentially rectangular cross section. The tail boom can be rounded. Just ahead of the tail position sand the boom to a hair more than 1/8 in.dia. for an inch or so . Later this will be the place for the tail mount tube.

Get the wing mount tubes and slice them to length with a sharp razor while still on the storage sticks. Slide them off the sticks and on to the wing mount jig. Lay this whole thing in the correct position on the motor stick



side. Shim under the stick or jig so that the tubes sit nice and flat on the side (usually left) of the stick. Glue in place with Cya. Remove the jig.

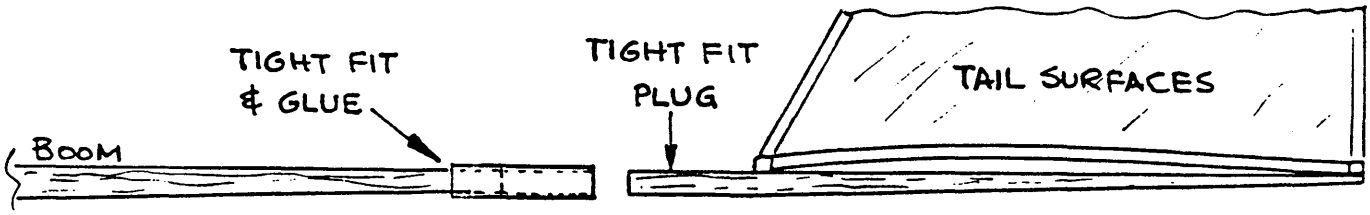
Now for the prop shaft and rear motor hooks, together with the shaft dual bearing. Every one has their favorite hook shape and rubber sleeves, O-rings, etc. My hooks look like a Z shape when viewed from the rubber band side. When wound, the motor tends to center itself on this type hook. The shaft bearing has to do two things. First, it must hold the thrust line you want and second, it must let you remove the prop complete with shaft for storage. Ray Harlan does a good bearing, but I make my own from music wire. The general principle of all dual bearings is similar. The front bearing is a plain hole thru which you thread the prop shaft hook. the rear bearing is a devious shape, which allows the hook to be 'screwed' thru or snapped in place and then grips the shaft when in the running position. Here are some sketches (enlarged) of my hooks and bearings.



I make my bearing loop and spiral by clamping two pieces of wire in a vice and then winding one around the other. Takes a lot of practice to get it just right. The front face is then stoned to remove any sharp projections.

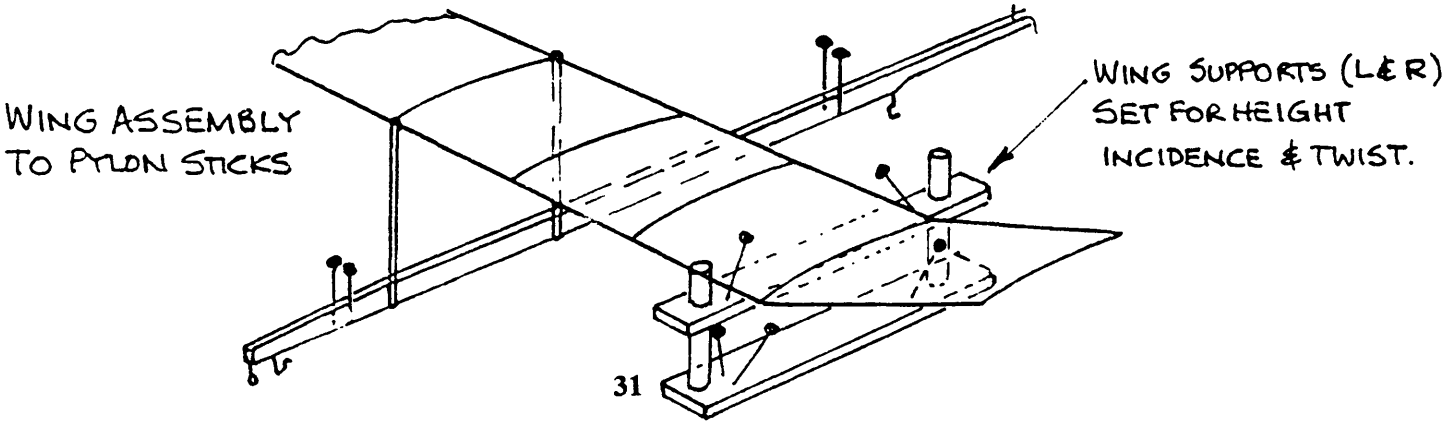
The front bearing and rear hook are both attached by binding a few turns of a strip of jap tissue and thinned Ambroid. A short piece of wire the same dia. as the prop shaft will help you align the bearing. You will need about 2 degrees of left sidethrust. Remember to allow for any slop which will straighten out with a wound motor.

Now for the tail boom. Fasten it down on the building board with pins and blocks. Set the horizontal stabilizer



in place and cement it. Likewise for the Vertical. If you have a droop down tail, block it up to clear. Remember the approx. 1/8 in. dia. bit sanded ahead of the tail? Cut thru it about one third back from its front end. Get the paper tail tube and cut it to length (approx 3/4 in.). Sand the front part of the cut to make it a tight fit on the tube. Insert about 1/4 in. and glue it. Sand the tail half of the cut to be a tight but removable fit. This will tend to loosen in time but a thin coat of Cya will take care of it. If you fly in a site where the plane can hit obstacles (and Who doesn't?) , put a small smear of Ambroid to secure the plug in part. Have a small bottle of acetone with you to loosen it later. If the boom is separate from the motor stick, they can now be joined.

WING MOUNT ASSEMBLY. Sand the lower 1/2 in. or so of the wing pylon sticks for a stiff fit in the motor stick tubes. Insert them in the tubes flush with the bottom. Pin the motor stick to the work board with the pylon sticks vertical. Support the wing using the props you used earlier so that the wing sits at the correct height between the pylon sticks. If all is well, the sticks should rest lightly against the L.E. and T.E. At this time you should include anywing twist called for,usually some left wing wash in (T.E.down) . I use less than 1/8 in.



When everything is in the correct position, glue the pylon/wing joints with Cya. I stopped using Ambroid for these joints after a small amount of creep occurred in storage which ruined the trim. If the plan calls for any diagonal braces, these can be added now. Remove the wing assembly and weigh it. Likewise the motor stick + boom and tail assemblies.

NEXT MONTH We will make the prop and give brief flying hints. However lets conclude with some fun. add some ballast to the nose to make the model balance at about 65% of the wing chord. Set the wing at a slight positive incidence relative to the tail. Set the right tail tip about 1/4 to 1/2 in. down. Test glide in your best clear space indoor (Air OFF). Adjust wing setting until almost stalling. It should turn slowly left and amaze your friends by its lack of speed !! Maybe not. It reminds me of a morning when I was giving an indoor flying demo to a bunch of about 80 sixth graders. My Pennyplane was steadily climbing to the gymnasium roof accompanied by ooo,s and ahhh's from all except one boy who asked " Sir, can you make it fly any faster?"

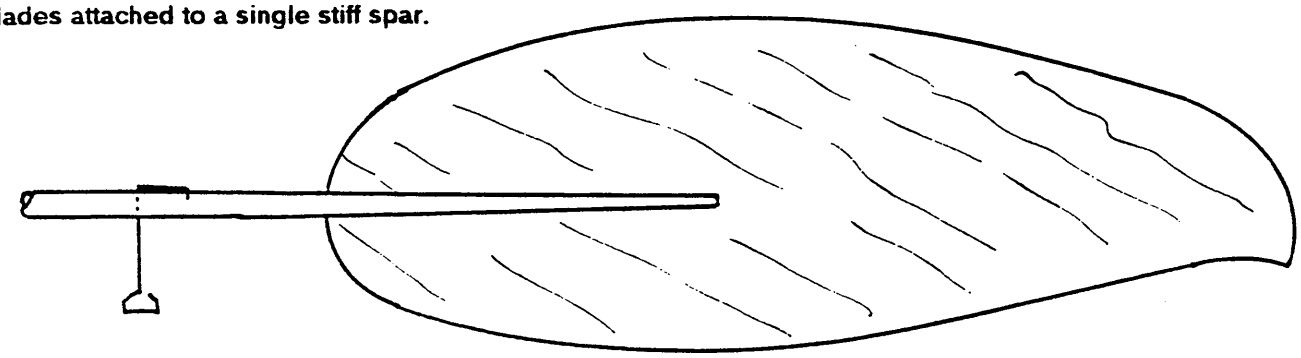
MY WAY - Part 4 John Barker (Georgia)

INTRODUCTION

If you read Parts 1 thru 3. you may already have built and covered the airframe and perhaps had some fun with test glides of a Limited (Novice) Pennyplane. However to get that model to the roof of the local school gym. or tangle with the roof at E.T.S.U. in Johnson City. you need a propeller and rubber band motor. For the novice to indoor free flight these easily can be the most neglected items. Volumes could be written about them, but we only have enough space to touch on some of the basic principals to get started. If you get hooked on indoor duration flying. the rubber motor can get quite expensive because you will need a rubber stripper. a winder with counter. and one or two torquemeters. However lets start with the propeller.

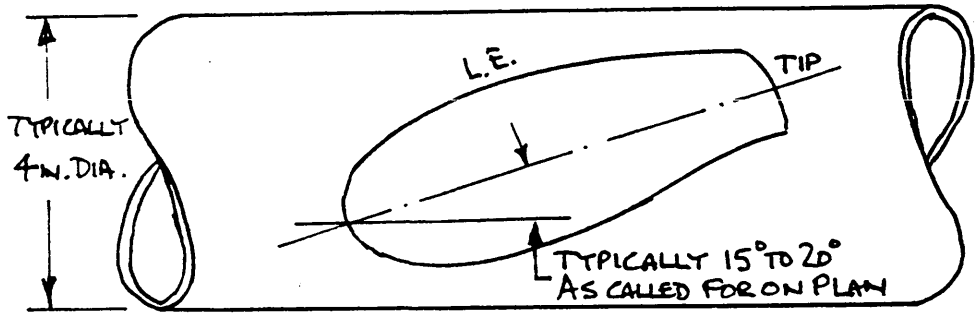
PROPELLER BASICS

Your plan will give you a good idea of the propeller construction. It will have thin molded light sheet blades attached to a single stiff spar.

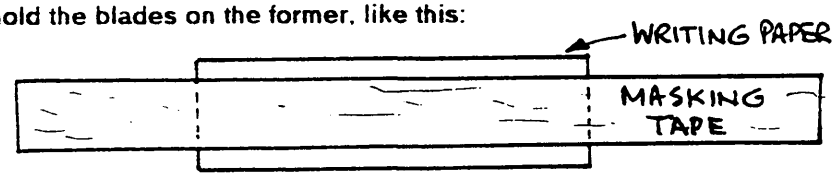


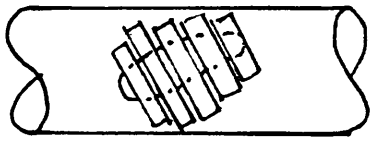
The Bare Blade. This will usually be made from 5 to 6 lb. C grain balsa. The grain may be shown straight or on the diagonal. The blades must be cut from the sheet so as to give a good stiffness match.
Blades are usually sanded to taper in thickness. typically from about 1/32in. at the root to perhaps half that at the tip. For sanding this thin. you must set the blade on a very flat surface (I use a 12in. square tile] and the sandpaper must be glued to a very flat block such as a piece of 1/2in. sheet balsa. It is important to match the blades for thickness and weight. The spring scale and a micrometer will help.

Molding The Blade Twist. Theoretically the optimum blade twist is for helical pitch which requires a carved



block former. but we will use a simpler and quite good method which involves setting the blade at an angle on a cylindrical surface. This method also induces an airfoil section to the blade. You need a smooth can,bottle or pipe of 4 in. dia. or as indicated on your plan. If the item you find is not quite the right diameter then the angle must be changed. The bigger the diameter the steeper the angle. Mark this angle on the former. twice. 180 deg. apart. together with blade outlines. Mark the spar lines on the blades. tip to tip. Prepare about 12 strips to hold the blades on the former. like this:

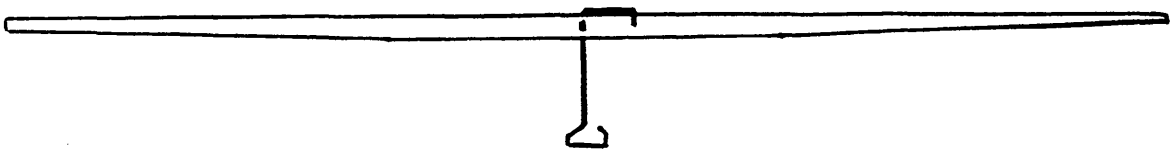




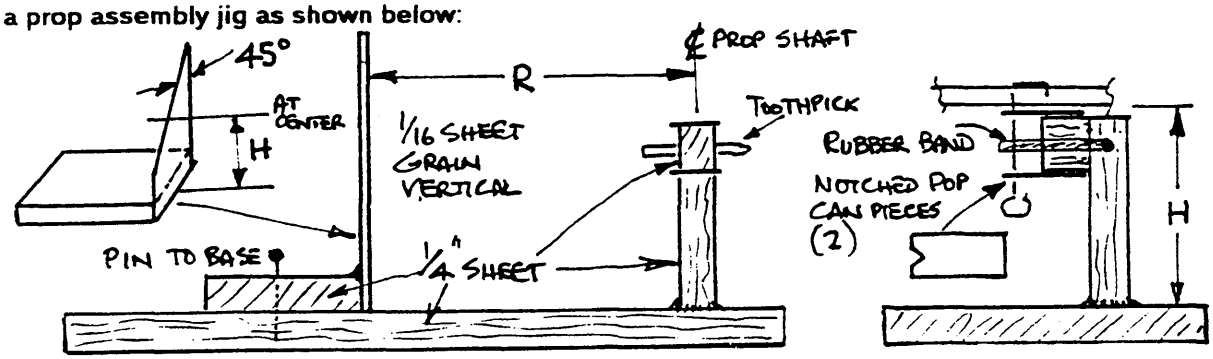
Get an Ace bandage [no. don't steal it from the first aid kit!] . Set the oven to heat to about 200 to 230 deg. Boil water. pour into a pan and add about two table spoons of household ammonia for each cup of water. Throw in the blades. Cover. or otherwise keep hot for ten minutes. The heat plus ammonia softens natures glues in

the wood and will clear your sinuses. Fasten the blades on the former using the prepared strips. Bind the whole thing with the bandage and bake for an hour. Remove from the oven and let it cool. I usually let it sit overnight. Uncover and carefully ease the blades off the former. Cut a slot for the spar if the plan calls for it.

Propeller Assembly. For the spar cut and sand a piece of medium hard 3/32in. or 1/8in. to the shape shown on the plan. Make a tiny hole in the center and insert the prop shaft. Bend and cement like this:



Make a prop assembly jig as shown below:



It is important that the notches for the shaft are aligned exactly vertical and that the center ofthe 45 deg. support is close to the height 'H'.

Fasten the shaft/spar item in the notched part using a small band hooked on to the toothpick. Rest one blade on to the spar and the 45 deg. piece. the blade will want to slide off the support. Use a pin to provide a stop. You may need to reposition the 45 deg. piece laterally to get the right height. The spanwise position 'R' sets the pitch. R=0.159xPitch (For 20in. pitch R=3.2in.) When it all looks good, apply Cya at the ends and at several points along the spar. Repeat for the other blade. Remove and admire your superb handiwork. Add a small nylon washer and weigh it.

Balancing. Clean off any ballast from the front of your motor stick and insert the propeller. Make certain it revolves freely. If one blade appears much heavier than the other, do some careful sanding. Don't worry too much about static balance. Go fly it. If it wobbles, it means that the blades are set at, or are flaring to, unequal angles. Check and tweak as necessary. Suffice to say that usually the wobble is affected more by unequal blade angles than by static balance.

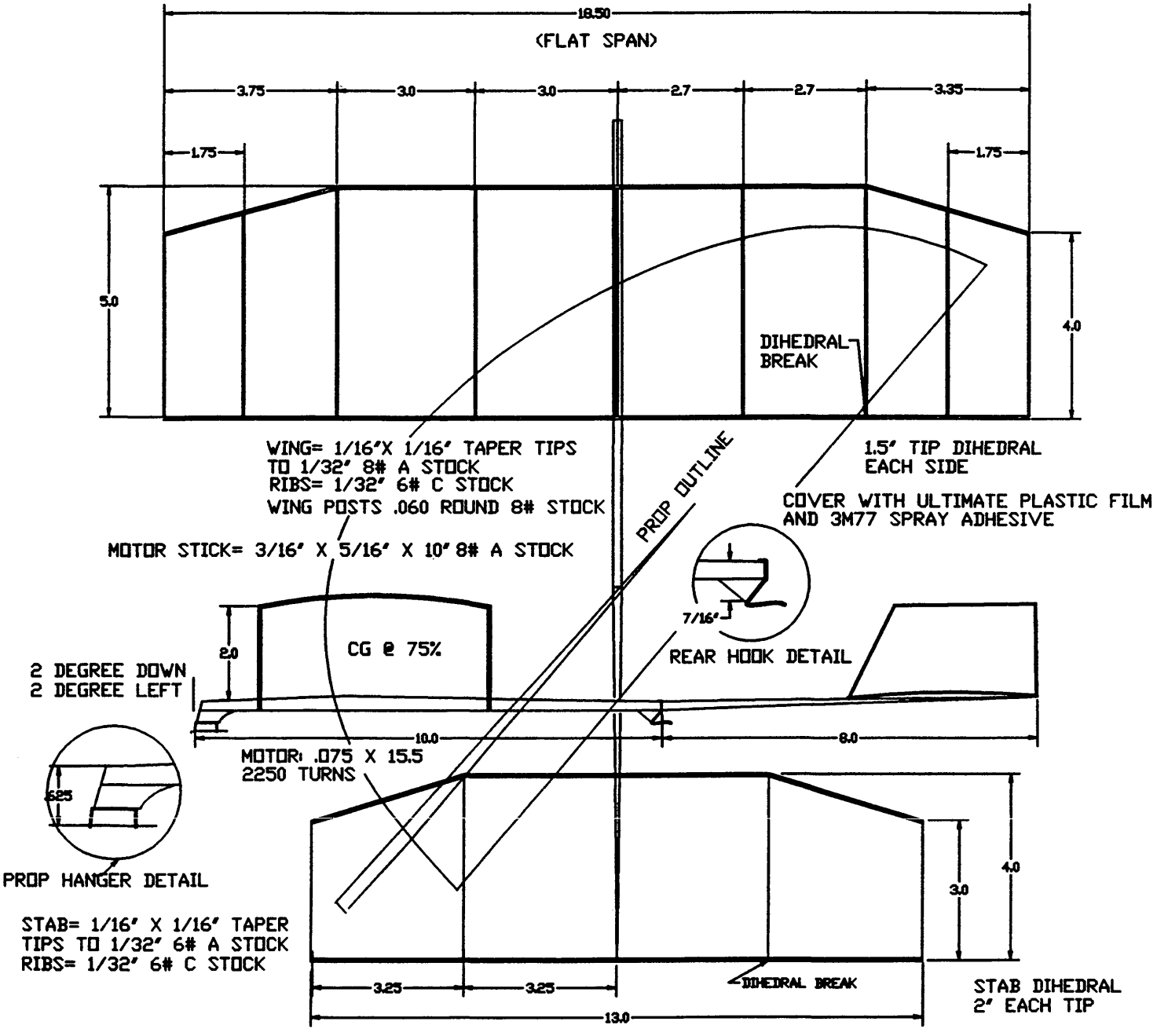
RUBBER BAND AND FLYING

Weigh the complete model without rubber. It must be at least 3.1 grams. For power, TAN 2 is the best. However it only comes in widths suitable for outdoor flying, 1/4in. etc. If your model is close to the nominal 3.1 grams, you will need some cut to .075, .080, and .085in. for starters. If your model is heavier, the sizes will have to be bigger. The way to get rubber of various odd sizes is to call Indoor Model Supply, or get someone who has a stripper to cut it from your 1/4in. strip. Please DO NOT ask a friend to do this on a contest day. Whatever you choose, make a small loop, say 4in., lube it(I use STP Son of a Gun protectant), break it in, then stretch wind it until it breaks. Calculate the breaking turns/inch. Make an 18in. loop of .080 and wind it to about 70% of breaking and then back down to 50%. With these turns trim the model close to the stall with wing post settings and the desired left turn with stabilizer tilt, right side down. If it climbs at this 50% [backed off] turns, the motor is probably too thick or too short. Similarly if it sinks, the motor is too thin or long. Either way, just wind up some more until you get a decent flight. MAKE NOTES for each flight; trim settings, motor size & weight, and flight time. Count the number of turns left at the end of each flight and calculate prop revs: (Turns wound - turns left) x 60 / flight time secs. = R.P.M.

Set a target flight duration for your site (be realistic !!) . Calculate a motor length assuming you use 90% of breaking turns : Length (inches) = R.P.M. x Duration Minutes / [0.9 x break turns per inch]

Bear in mind that a short motor will not run long enough, but an extra long one will be too heavy. You need to do a lot of flying to get the motor just right for one flying site. So get started and have fun. Nice talking to you.

John



WEIGHTS:

WING	.028
PROP	.030
REST	.052
TOTAL	.110

PROP BLADES= .028" 6# C STOCK
HUB= 3/32" X 3/32" X 7" 8# A STOCK
TAPER TO 1/32" ROUND
HOOK= .020" WIRE

PROP BLADES ARE FORMED WET ON
A 5" DIA VENT PIPE AT A 17 DEGREE ANGLE

OPEN LIMITED PENNYPLANE
"SKIPPER"
CAT.1 RECORD 16:14
JUNE 17th 1996
by WARREN WILLIAMS

DRAWN BY STEVE GARDNER

1997 Indoor Free Flight National Championships

East Tennessee State University, Memorial Center Arena Johnson City, TN

May 28 - June 1, 1997

AMA HQ USE
Type _____
Amount _____
Date _____
Entered by _____

AMA SINCE 1936

Contestant Information:

1. ☐ JR ☐ SR ☐ OP

2. Date of Birth _____ 3. AMA # _____

4. Name _____

5. Address _____

City _____ State ____ Zip _____

6. Day Phone (_____) _____

Fees are a result of AMA and SIG negotiation. Entry forms postmarked after April 28, 1997 must include late registration fee of $15. Requests for refunds must be in writing and postmarked by April 28, 1997.
ABSOLUTELY NO REFUNDS AFTER APRIL 28, 1997.

FEES:

Entry (1 event) $ _____

Additional events: 10 X _____ = $ _____

Late fee if applicable: $ _____

Site donation (optional): $ _____

Total Enclosed: $ _____

☐ Check ☐ VISA ☐ MasterCard Exp. date __ __/__ __

Card # __ __ __ __ - __ __ __ __ - __ __ __ __ - __ __ __ __

Event/Schedule

Wednesday, May 28
Practice Day

Thursday, May 29
- ☐ 201 *HL Stick
- ☐ 202 Intermediate Stick
- ☐ 203 *F1D
- ☐ 204 Cabin ROG
- ☐ 209 Helicopter
- ☐ 210 Ornithopter
- ☐ 211 Autogiro
- ☐ 212 HL Glider
- ☐ 214 ROG Stick
- ☐ 218 Standard Cat. Glider (JS) (O)
- ☐ 219 Unlimited Cat. Glider (JS) (O)

Friday, May 30
- ☐ 205 Manhattan
- ☐ 207 Pennyplane
- ☐ 215 Bostonian

Saturday, May 31
- ☐ 208 Limited Pennyplane
- ☐ 505 Peanut Scale

(201, 203 finish flying)

Sunday, June 1
- ☐ 206 Easy B
- ☐ 213 Kit Plan Scale
- ☐ 220 Ministick
- ☐ 507 Flying Rubber Scale

**Events will finish flying on Saturday, May 31.*

Banquet will be Friday, May 30 at 6:30 PM.

Fees:
Open: $25 first event, $10 each additional
Jr/Sr: $10 flat fee (any number of events)

FOR ANY AND ALL EVENTS: I hereby certify that I have read all information accompanying this entry form, and that models entered by me will be built by me (if required) and flown in compliance with the current Competition Regulations or FAI Sporting Code if it applies, and will previously have been successfully flight tested and proved to be airworthy in accordance with the Official AMA Safety Code.

_____ _____
(Applicant's Signature) (AMA Number)

IN CASE OF EMERGENCY PLEASE CONTACT:

NAME _____ Day Phone _____ Relationship _____

Address _____

City, State, Zip _____

APPLICANT CHECK LIST:

- ☐ Double check and verify correct fees are enclosed
- ☐ Check(s) signed and payable to AMA
- ☐ Name, AMA number, and complete address shown
- ☐ Emergency contact information (above)
- ☐ Have read all schedule and processing information
- ☐ All credit card information is given (expiration date, card number, card company)
- ☐ All events are indicated
- ☐ No conflict exists in "one only" events, if applicable
- ☐ Team entry is in compliance with AMA rule book, if applicable
- ☐ Frequency information, if applicable, is complete and correct
- ☐ Signature above

Send registration form to AMA Headquarters, 5151 E. Memorial Dr., Muncie, IN 47302. Attn: Competitions Dept.

1997 AMA INDOOR NATIONALS AND THE SIXTEENTH UNITED STATES INDOOR CHAMPIONSHIPS
"MINI-DOME"- EAST TENNESSEE STATE UNIVERSITY
JOHNSON CITY, TENNESSEE
MAY 28 THRU JUNE 1

Send Entry Payable To:
USIC 97, 5432 Haft Rd., Cincinnati, OH 45247

NON AMA EVENTS REGISTRATION

NAME _____ AMA # _____

STREET _____ JR [ ] SR [ ] OPEN [ ]

CITY _____ STATE _____ ZIP _____

PHONE # _____

I hereby certify that I understand all of the rules under which I will compete and will diligently follow the Official AMA Safety Code as well as any rules that may be established on site and will apply the use of accepted common sense in all my flying and affairs at the contest site.

SIGNATURE _____

FEES
Basic entry fee includes one event.

Entry fee	**$ 10.00**	_____
Junior and Senior entry	**$1.00**	_____
Additional events, OPEN	**$5.00**	_____
Additional events Jr & Sr	**$1.00**	_____
Banquet (Per Person)	**$21.00**	_____
8' Table & 2 Chairs	**$14.50**	_____
Dormitory cost (See below)		_____
Total Fees	**$**	_____

DORMITORY COST AT ETSU RESERVATION

Single occupancy	$26.50 per night
Double occupancy	$26.50 per night
Triple occupancy	$41.25 per night

*Please Indicate Reservation In:

	May 28	May 29	May 30	May 31	June 1	No. of Rooms
Single Occ						
Double Occ						
Triple Occ						

Name of room mates if known.

_____

No linen will be provided, so bring your own sheets, pillow cases, towels, etc. For double and triple occupancy rooms, you must recruit your own room mate(s). Some rooms are with baths and others have adjoining baths, (shared). NOTE: a $25.00 fee will be charged for lost or unreturned keys. *NO EXCEPTIONS.*
REBATES WILL BE MADE AS APPROPRIATE ON ROOMS
DORMITORY HOUSING WILL BE IN CARTER HALL.

NON-AMA EVENTS

[x] Events entered

[ ] Pro 20
[ ] 35 CM
[ ] FROG
[ ] No Cal
[ ] Golden Age Scale
[ ] Pistachio
[ ] High Wing Mono
[ ] WWII
[ ] Unlim Rbr Speed.
[ ] Coconut Scale
[ ] Mass Launch P-24

MUST BE POSTMARKED BY MAY 22, 1997
LATE ENTRY FEE OF $10.00 PAYABLE ON SITE

MAKE CHECKS PAYABLE TO USIC 97

Banquet to be held on the 30th of May 6:30 P.M at the Holiday Inn. (Formerly the Sheraton Plaza)

In Case of Emergency, Please Contact:

Name _____

Street _____

City _____

State _____ Zip _____ Phone: ( )_____

USIC 97
5432 HAFT ROAD
CINCINNATI, OHIO 45247

1997 International Mini-Stick Postal Contest

The St. Louis Thermaleers invite all indoor flyers to take part in the 1997 International Mini-Stick Postal Contest to be held over the winter period. The rules for the contest will be as follows:

1. The contest is open to Indoor models that comply with the Living Room/Mini-Stick rules.

2. Contest flights are to be made between 1 Jan.. 1997 and 31 Mar., 1997.

3. Any number of flights can be made at any number of sites.

Wing

4. All contest flights to be timed by someone other than the flyer.

5. All contest flights to be recorded on an official Results Form. (Included in this issue. Copies can be made.)

6. Best single flight time wins, after the flight time has been corrected for different ceiling heights. Ceiling height to be measured as per the FAI, but with a 5 meter diameter circle. The correction factor is 627 divided by (167 plus 46 times the square root of the ceiling height in feet). The time in seconds will be multiplied by this to give the corrected time.

7. Prizes will be awarded dependent on the number of contestants.

8. All Results Forms to be returned no later than 10 April, 1997 to the address below:

9. Entry is free to all contestants.

10. Results will be sent if a S.A.S.E. is included with the Results form.

Send your results to:

Larry Coslick
4202 Valley Crest Hills Drive
St. Louis, Missouri 63128

MINI-STICK MODEL RULES

Monoplane, max span	7.0 in.
Max Wing Chord	2.5 in.
Stick Length	5.0 in.
Max Model less (less prop)	10.0 in.
Stab (Tail) Area Max = 50% of	

Covering Plastic/paper. NO microfilm

Propeller Wood Prop, 7" dia. max.
Minimum Weight (0.43 gms)0.015 ounces

Flying
Steering 4 Ten Second Steers*
Attempt 15 Seconds or more*

*Special rules for very small rooms only! (Living Room flying.)

Indoor Postal Contest Results Form

Club Name_____

Date of Contest____/____/____ Site Name_____

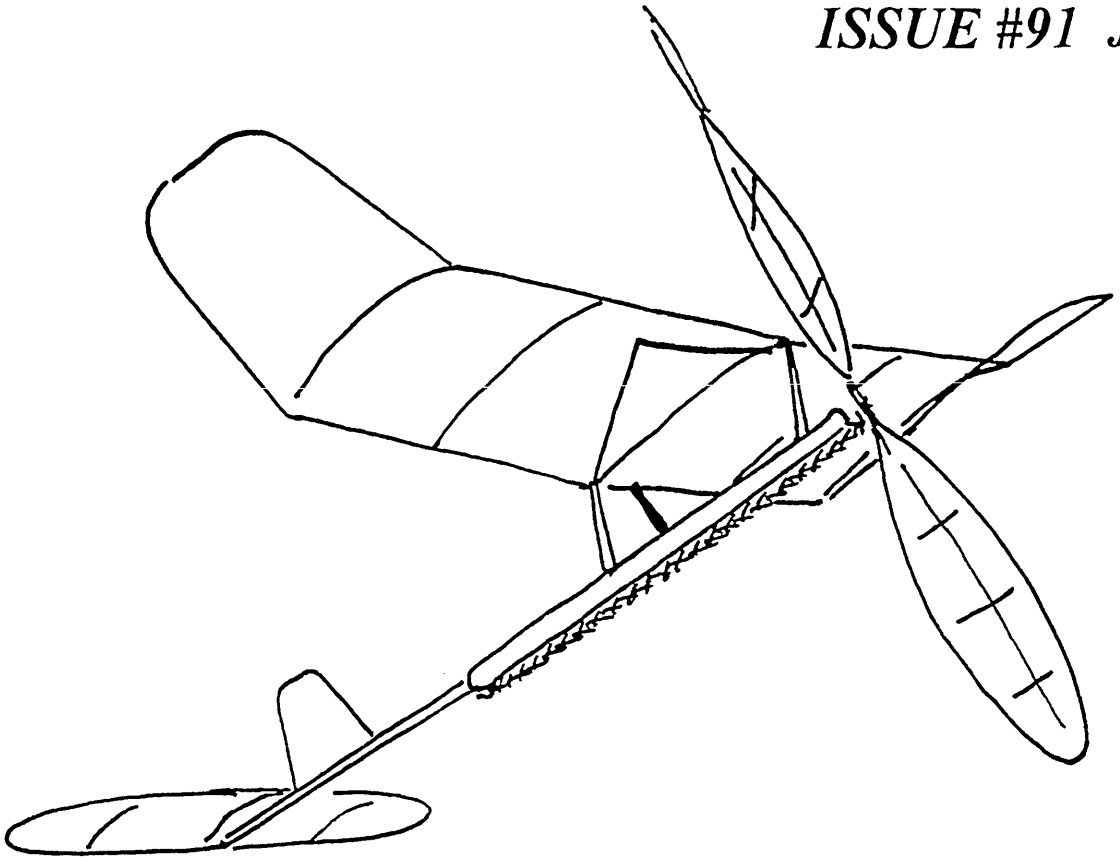
Ceiling Height_____Feet

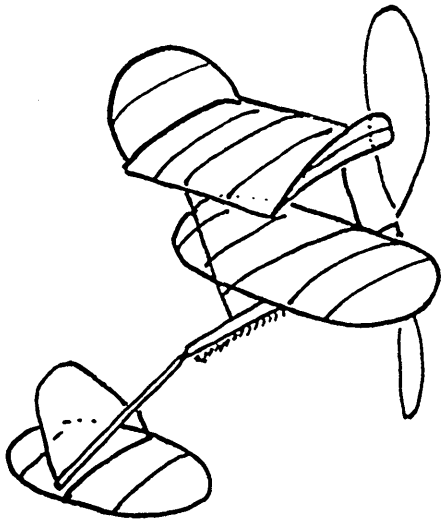
Contestant Name SMAE No. Age (if Jr.)	Address	Time in Seconds	Timer Initials	Leave Blank
		1.		
#		2.		
		3.		
		4.		
		5.		
		1.		
#		2.		
		3.		
		4.		
		5.		
		1.		
#		2.		
		3.		
		4.		
		5.		
		1.		
#		2.		
		3.		
		4.		
		5.		

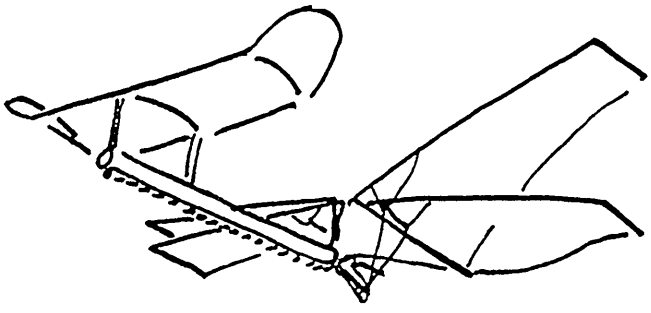
INAV

1997 USIC/AMA NATS

ISSUE #91 JULY 97







INDOOR NEWS AND VIEWS (INAV) IS PRODUCED
IN ST LOUIS BY LARRY COSLICK, GENE JOSHU,
HOWARD HENDERSON, BILL MARTIN,
STEVE GARDNER, AND ROY WHITE

INAV DUES ARE

U.S.	$: 9.00/year
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444 Bryan, St. Louis, MO 63122
Phone: 314-822-3980

(INAV) can be reached via computer E-mail at the following addresses:
AEROBAT77@ AOL.COM (Steve Gardner)
H PIET H@AOL.COM (Howard Henderson)

THE PRODUCERS ARE LOOKING FOR VOLUNTEERS TO TAKE OVER PUBLICATION OF INAV. ANYONE INTERESTED SHOULD CONTACT HOWARD HENDERSON.

Steve Brown makes official 60 minute flight

After several months of effort I was able to set a new world record for microfilm models on June 1 at Santa Ana. The time was 60:01. This is the first "official" one-hour flight.

After my "unofficial" flight of 63:54 last September the weather seemed to get cooler with each flying session. After a few attempts it became clear that another one-hour flight would have to wait for warmer air. I did have a few flights that came close: 58:59 and 59:32 on May 4. 59:32 is a long time to wait just to find out you're a few seconds short.

I used the same Time Traveler design, this time with a 21.2" prop. This model really needs a larger prop to limit the RPM's, but the 21.2" was the best of the ones I had on June 1. I used a longer loop of August 93 Tan II, 19.5", to compensate for the higher RPM of the smaller prop. The model was launched at 1:50pm and reached 150' altitude in 16 1/2 minutes. Between 16 1/2 and 27 minutes I had to make four brief steers to re-center the model since it was in the narrowest part of the ceiling. By 45 minutes the model had descended to catwalk altitude, 137'. The rest of the flight was uneventful until the model reached about 25' of the floor where it was buffeted a little by turbulence. Total time was 60:07 with 6 seconds of prop stop. Average RPM was 41.4.

I think the next step is to further develop Time Traveler. Greater wingspan would increase the repeatability of the model and make 60 minute flights less dependent on air conditions. The drawback would be increased fragility on the ground. More experimentation is needed to develop a larger prop that would then enable the use of a shorter and lighter loop of rubber.

Steve Brown

HOW WE GOT A KID'S FLYING CLUB STARTED

Like many of you I have been one of those lonely fliers stuck in a part of the country where not a whole lot of rubber twisting goes on. If you love airplanes, that makes you a little different, but if you are into rubber-powered free flight you are almost weird. The fear of hearing "boys with their toys" keeps a lot of prospective fliers out of the hobby. I had tried unsuccessfully for more than ten years to get any friend to join me in this hobby of ours. I even gave models away to try to get something going. But I had to go it alone.

Then one day I thought about taking a few kids with me to a contest and let them fly some of my old stuff and help me in the contest. This was a great day. We had more fun than is legally allowed. That fall, 1995, I got the kids to meet with me at the church building on Thursday nights from 5:00 to 8:00. (I should mention that I am a minister and thus had access to our facilities, but you shouldn't have any problem finding a place to meet, i.e., rescue squads, schools, clubs, churches, airport hangars, garages, etc.) I started out with about five kids, all boys. We built Delta Darts and flew them all to destruction. This caused others who heard about us to join, and by Christmas we had ten meeting every week. The next thing we built was the Pussy Cat. What a great plane! It flies well inside and is really easy to build. Then we built the old Ross Flyer (indoor type) with no wheels. To simplify the front end I had them help me build cottage cheese carton propellers on plastic Q-Tips. The kids went nuts when they started getting two-minute flights in our auditorium. Time for a contest!

I used a local gym for our first contest, and all the parents were invited. I suspended a hula-hoop from the rafter with a dollar taped to it and told them that the first five kids with planes to fly through were going be awarded a dollar. This kept everyone cheering as we flew endurance, precision time, and mass launch. Parents even got excited and helped. With ribbons to give away and demonstration flights of all kinds, we were on our way to having a great club. Hey no more lonely me! I had model builders all around me ready to fly at a moment's notice.

Our next step was to build Perry Birds with no wheels and fly them indoors. They were an excellent choice. By now I got a sponsor to buy us all custom T-shirts for the Flying Aces of Smyrna, Tn. The kids wore them to school with pride. In contacting the Atlanta indoor club, I found an open invitation for us to come to their annual contest. We took everything that we had and flew when the heavies flew. Let me tell you, the men were really good to us and seemed to enjoy having us. They encouraged the kids (by now we had two girls in the club). We came back and all of us built profile P-38s. Six of the kids wanted to go to Genniseo for the big contest. We went and were treated very well by many of our fellow fliers.

When September 1996 rolled around, I had two helpers join the club: the mother of two of our fliers, Lisa Spradling (an excellent builder), and a father, Wayne Anderson ,who also builds superbly. We now had twenty kids working every Thursday night. We built twenty tow-line gliders. This was a mistake since it took some kids more than four months to complete a plane. We did not have time for a contest, and the kids really wanted to fly. By February 1997 we finally finished the gliders and decided that we would plan on going to the Johnson City Nationals. I called Abram VanDover to see if it could be worked out for us to come. This kind and generous man paved the way for us and encouraged us to make the effort. I had a video of the contest, and after showing it to the kids, I told them that if they would get serious and build three planes by the end of May they could go. Well, eleven of them made a tremendous effort. We now had kids building P- nuts (six), profiles, endurance models and one girl, Michelle Boyd who insisted she could build a coconut Aristocrat. The closer we got to the contest time, the more excited the kids got. I even spent several Saturday mornings helping some of them complete their projects.

By the time the contest came, our sponsorer bought us new T-shirts with a racing plane on the front; this really made the kids proud. With everything packed in boxes off we went to Johnson City. At first we were somewhat apprehensive. You didn't know us, and we didn't know you. It took a little getting used to.

but we finally learned to walk slowly. Then the flying started. What great fun! Many of the men came over and helped some of our kids get their planes flying. We had some low-wing P-nuts that seemed impossible, but these men got them to fly for 40 seconds. I want to thank everyone who gave of his time. Every one of the kids got a lot of attention and learned a lot, first hand, about how to get a model trimmed.

Did Michelle (13 years old) get her coconut finished? Yes! And believe, me she constructed it all herself, and covered it herself. She even cut out the lettering and made the dummy engine cylinders out of corks with thread. I made her propeller, turned her wheels, and helped her air brush it. What a thrill it was when we found out that she had placed second in the scale judging. Every official flight she made was a thrill of a life-time for me since she kept edging up in her score. One flight went for 2:47. As fliers around the field realized what she had built and how she was doing they would stop to watch her time and applaud at the end of each flight. Could she win? Win she did, and first place at that, in coconut and third in Golden Age. This has just about sent our club into orbit. They all want to build coconuts too. To top off the contest, one very generous man bought each of our kids a good flying kit. We also ran a contest among our kids and had someone very official pass out the ribbons. What a great group of fliers you indoor people are. As the saying goes, "We will be back."

If you are wanting to start a club of kids, let me tell you you can do it. I have more kids wanting in our club than we can handle. It truly is a good thing since it teaches them to use their hands, visualize a blue print, excel in an area they know little about, and take pride in their work. It also is an interesting hobby. You have to believe in the benefits or you will never get started.

Take a kid or two (with their parents if need be) to a contest (put a display at the library or fly for the local school to find interested kids). Give them something to fly. Start off with a small group and teach them to build. Hold a contest. Give away ribbons. Get some T-shirts. Hang planes from the ceiling. Find someone to help you. Be prepared to spend one night a week helping them build. Challenge them and be proud of every effort they make.

Once you get something started, build on to it. Challenge the kids to compete with each other and to invite their friends. Take them to flying events (teach them to practice etiquette and manners). Have a camp-out where you fly until dark. Have fun! Be patient, and kind. Be excited, whoop it up when someone puts in a great flight. Involve the parents. Get the kids' pictures with their models in the local paper. You can do it. Not only will you help keep this great hobby alive, but you will also help kids have confidence that they can do the difficult. Don't be a selfish flyer who does his own thing all alone somewhere; it may not amount to much. With our club I have enjoyed the hobby a lot more. We hope to compete in penny-plane, P-nut, coconut, and mini stick next year at the nationals. Come with your group of kids, and lets get things to really kicking. I promise I will personally cheer for you. If I can help you in any way, let me know: Tim Lavender, 1-615-459-4799. Our motto on the back of our shirts next year will be, "Fly, But Walk Slowly, Very Slowly."

Tim Lavender

1997
USIC/AMA NATIONALS
JOHNSON CITY, TENN.

The following pages give the results of this years contest. We had planned a page or two of storyline, but feel that the Tim Lavender story was more important. The need to get new people, especially younger people, into this hobby is something we all should be concerned about.

USIC 1997 HL STICK #201

PL.	CONTESTANT	AMA NO.	FLT 1	FLT 2	FLT 3			BEST FLIGHT
1	COSLICK, LARRY	4652	35:20	41:10				41:10
2	BARR, LAURIE	6553	1:13	35:30	40:41			40:41
3	DOIG, RICHARD	5392	34:31	11:21	12:59	38:44	35:06	38:44
4	WILLIAMS, WARREN J.	5550	20:09	20:03	28:57	32:57		32:57
5	TELLIER, FRED	F12	31:08	21:40				31:08
6	BURKE, EDWARD J.	153313	20:22					20:22
7	SOVA, TOM J.	473169	14:20					14:20
8	CLEM, JIM	L55	8:47					8:47
9	BIENENSTEIN, ROBERT	268						DNF
10	GRANT, JAMES B.	159477						DNF
11	LOUCKA, LARRY	1210						DNF
12	MCGILLIVRAY, JACK	F65						DNF
13	TENNY R.	16718						DNF
14	VALLEE, THOMAS	1126						DNF

USIC 1997 INTERMEDIATE STICK #201

1	COSLICK, LARRY	4652	38:51	26:80	27:28			38:51
2	BARR, LAURIE	6533	32::15	32:27	37:45			37:45
3	THOMAS, MIKE	F66	34:20	32:36	6:13			34:20
4	KAGAN, JOHN	469254	33:12					33:12
5	MCGILLIVRAY, JACK	F65	32:05	11:32				32:05
6	GRANT, JAMES B.	159477	23:12	22:48	15:11	30:28	25:28	30:28
7	HARDCASTLE, R. R.	847	21:38	26:30	27:28	30:08		30:08
8	OLSHEFSKY, PETER	F62	25:30	18:44	0:11	22:01	10:23	25:30
9	BARKER, JOHN	2095	25:06	23:01	22:46			25:06
10	KOPTONAK, JOHN D	58027	23:38	20:35	5:51			23:38
11	GANSER, RONALD	7532	20:37	22:41				22:41
12	TELLIER, FRED	F12	1:19	16:45	10:55	21:58	11:50	21:58
13	NUSZER, JOSEPH B.	29036	12:29	20:57	19:58			20:57
14	MARETT, JOHN	F68	14:46	20:15	18:20	19:04		20:15
15	VALLEE, THOMAS	1126	19:51	19:00				19:51
16	DOWNS,K F.S.	2209	14:42	19:48				19:48
17	RAYMOND JONES, D.	63358	15:25	14:46	18:16			18:16
18	SOVA, TOM J.	473169	16:46	8:00	12:03			16:46
19	WILLIAMS, WARREN J.	5550	5:05					5:05
	BIGGE, WILLIAM R.	L127						DNF
	HARTMAN, PHILLIP	8667						DNF
	JOHNSON, KENNETH B.	28705						DNF
	JOSHU, EUGENE R.	260643						DNF
	LOUCKA, LARRY	1210						DNF
	O'GRADY, DAN	F57						DNF

USIC 1997 FID # 203

PLACE	CONTESTANT	AMA NO.	0:00	0:00	0:00	0:00	0:00	0:00	BEST FLT	2ND FLT	TOTAL BEST 2
1	DOIG, RICHARD	6392	12:59	34:21	40:51	14:55	31:51	10:37			75:12
2	HULBERT, WILLIAM	1317	26:22	34:17	36:54	8:10	34:23	34:31			71:25
3	TELLIER, FRED	F12	32:26	27:26	30:34						60:00
4	KAGAN, JOHN		2:01	28:43	ATT.	26:42	11:07				55:25
5	HARDCASTLE, R.	847	22:31	24:11	10:34	23:15					47:26
	COSLICK, LARRY	4652	27:27	18:33							46:00
	BARR, IAURIE		10:56	9:32	MIDAIR						20:28
	BURKE, EDWARD J.	153313	14:32								14:32
	LEONARD, NICHOLAS,JR	497460 JR.	8:23	5:54							14:17
	LEONARD, NICK A.	497461									
	LOUCKA, LARRY	1210									
	MCGILLIVRAY, JACK	F65									
	VALLEE, THOMAS	1126									
	BIENENSTEIN, ROBERT	268									
	CLEM, JIM	L55									
	GRANT, JAMES B.	159477									
	UNDERWOOD, GARY										

USIC 1997 MANHATTAN # 205

1	VAN GORDER, WALTER	19912	12:34		12:05	13:41		13:41
2	COSLICK, LARRY	4652	2:33	10:24	12:17	11:25		12:17
3	THOMAS, MIKE	F8	8:50	10:16	11:21	11:24	12:04	12:04
4	GRANT, JAMES B.	159477	8:11		12:00	4:01		12:00
5	MARETT, JOHN	F68	8:38	11:18	9:51	6:35	8:50	11:18
6	GANSER, RONALD	7532	10:04	11:09	10:23			11:09
	BARR, LAURIE	6553	11:03	4:35	3:00			11:03
	KOPTONAK, JOHN	58027	7:06	9:23	9:33	7:55	9:59	9:59
	WECKERLY, STUART	13250	7:59	7:57	7:56	7:26		7:59
	RAYMOND JONES, D.	63358	3:41	5:58	5:36	5:49	5:11	5:58
	VAN DOVER, ABRAM	894	1:50	1:55				1:55
	PLASSMAN, GERALD E.	107613						DNF
	LOUCKA, LARRY	1210						DNF
	LEONARD, NICK A.	497461						DNF
	LEONARD, NICHOLAS, JR.	497460						DNF

USIC 1997 HL GLIDER # 212

	CONTESTANT	AMA NO.	FL 1	FL 2	FL 3	FL 4	FL 5	FL 5	FL 7	FL 8	FL 9	BEST FLT	2ND FLT	TOTAL BEST 2
1	SURTEES, LEONARD G.	587511	41.7	60.8	67.4	62.3	51.7	71.5	68.3	75.2	76.6	76.6	75.2	151.8
2	BOEHM, BERNARD	92567	73.8	72.8	71.5	74.5	73.4	0	0	0	0	74.5	73.8	148.3
3	EBERLE, ROBERT	411592	63.9	6.8	47.3	55.1	27	62.8	61.6	59	59.3	63.9	62.8	126.7
4	VON BUEREN, KARL F.	51477	51	55	44.5	55.7	4.8	50.5	50.4	51.5	53.5	55.7	55	110.7
5	PLASSMAN, GERALD E.	107613	36.3	27.4	40.6	42.8	35.1	22.9	42.7	14.3	23.8	42.8	42.7	85.5
	BENNETT, MARK C.	475698												DNF

USIC 1997 EZB # 206

PLACE	CONTESTANT	AMA NO.	FLT 1	FLT 2	FLT 3	FLT 4	FLT 5	BEST FLIGHT
1	COSLICK, LAWRENCE	4652	27:47	27:50	12:17	29:01	30:45	30:45
2	CAILLIAU, L.	79985	23:30	27:42	5:58			27:42
3	BARR, LAURIE		18:12	27:19				27:19
4	MCGILLIVRAY, JACK	F4	22:27	24:43	26:10			26:10
5	VAN GORDER, W.	19912	22:58	25:37				25:37
6	THOMAS, MIKE	F8	25:06	6:29	6:08	6:37		25:06
7	KAGAN, JOHN		8:07	24:08	7:21	21:05		24:08
8	SOVA, TOM	473169	19:29	21:54	23:46			23:46
9	CLEM, JIM	L55	21:02	22:22	23:26			23:26
10	TELLIER, FRED	F 12	22:57	17:43	22:41	23:22	23:01	23:22
11	HARDCASTLE, R.	847	16:57	21:12	17:48	23:14		23:14
12	GARDNER, STEVE		3:11		12:09	17:18	21:53	21:53
13	JOSHU, EUGENE	260643	7:24	19:32	21:37			21:37
14	O'GRADY, DAN	F7	20:37	21:31	7:40			21:31
15	GRANT, JIM	159477	8:01	14:57	19:51	17:56	21:26	21:26
16	RAYMOND JONES, D.	63358	14:56	7:07	21:07			21:07
17	BENNETT, MARK	475698	20:27	12:19	9:20	13:46	16:44	20:27
18	LEIFER, LOUIS	F14	8:40	9:57	2:50	19:15		19:15
19	WECKERLY, STU	13250	9:22	14:29	16:22	19:14		19:14
20	MILLER, RICHARD		14:47	13:77	3:45	18:39		18:39
21	OBARSKI, R. W.	560	18:37					18:37
22	OLSHEFSKY, P.	F6	14:24	16:08	18:07	15:32	16:24	18:07

PLACE	CONTESTANT	AMA NO.	FLT 1	FLT 2	FLT 3	FLT 4	FLT 5	BEST FLIGHT
23	FELLIN, JOHN	95353	18:06	16:34	16:37			18:06
24	BARBER, DOUGLAS	56270	13:04	4:19	0:22	17:54		17:54
25	ZUFELT, JAMES	F5	15:31	17:44				17:44
26	HENDERSON, W.	F10	5:01	7:40	9:15	17:31		17:31
27	ITALIANO, A.J.	2386	17:24	4:35				17:24
28	VON BUEREN, KARL	51477	13:56	10:58	17:13			17:13
29	SINGER, LEN	209081	15:13	17:04				17:04
30	BARKER, JOHN	2095	13:28	10:00	12:52	16:20	15:36	16:20
31	VALLEE, THOMAS	1126	14:28	2:11	16:06			16:06
32	GANSER, JOHN	179424	15:37	15:44				15:44
33	RASH, FRED	63458	13:14	15:42	15:14			15:42
34	WISNIEWSKI, GORD	716	15:11	10:20	14:30			15:11
35	TELLIER, ROB, JR.		14:57	12:34				14:57
36	VAN DOVER, ABRAM	894	11:11	10:47	10:07	12:52		12:52
37	WRZOS, CHESTER	20454	10:02	12:25				12:25
38	PLASSMAN, GERALD	107613	1:20	12:06				12:06
39	CHIZMADIA, JOHN		10:52	12:00	8:56			12:00
40	WALTON, NICK	397340	8:19	9:04				9:04
	TENNY, R.	16718						DNF
	SULLIVAN, EDWARD	69585						DNF
	SEAVER, TED	397871						DNF
	NUSZER, JOSEPH	29036						DNF
	HARTMAN, PHILLIP	8667						DNF

USIC 1997 PENNYPLANE # 207

PL.	CONTESTANT	AMA NO.	0:00	0:00	0:00	0:00	0:00	BEST FLT.
1	O'GRADY, DAN	F7		19:15				19:15
2	THOMAS, MIKE	F8	15:52	16:18	18:17	19:01		19:01
3	OLSHEFSKY, P.	F6	15:02	12:44	14:57	16:26	18:15	18:15
4	COSLICK, LARRY	4652	16:38	18:14	17:29	17:43		18:14
5	WISNIEWSKI, GORDON	716	16:55	15:07	17:27	10:53	17:57	17:57
	HARTMAN, PHILLIP	8667	13:53	15:40	17:10	11:03	15:31	17:10
	CLEM, JIM	L-55	4:29	17:07	15:38	14:59		17:07
	KAGAN, JOHN	469254	3:11	14:50	16:26	16:58		16:58
	ALVIREZ, PHIL	F15	3:58	15:04	16:17	4:06		16:17
	WALTON, NICK	397340	9:07	10:42	16:02	9:54	14:50	16:02
	SOVA, TOM	473169	12:08		14:40	14:03	15:48	15:48
	TELLIER, FRED	F12	12:12	7:42	14:01	15:48	15:48	15:48
	MCGILLIVRAY, JACK	F4	11:36	13:55	15:25			15:25
	JOSHU, EUGENE	260643	9:22	15:13	6:51	9:53		15:13
	GANSER, JOHN	179424	14:11	14:58	14:38			14:58
	LOUCKA, LARRY	1210	14:34					14:34
	GRANT, JAMES	159477	14:01	12:24	5:55	13:04		14:01
	HARDCASTLE, R.	847	11:23	9:04	8:10	13:13		13:13
	HENDERSON, W.	F10	12:56					12:56
	TENNY, R.	16718	9:48	11:12	12:23	12:53		12:53
	OBARSKI, DICK	560	5:04	12:09	7:17	12:47	7:20	12:47
	FELLIN, JOHN	95353	12:33	11:08	4:18	12:28		12:33
	ITALIANO, A.J.	2386	8:25	8:41	9:55	12:10	11:13	12:10
	RASH, FRED	63458	4:35	11:54	11:27	11:57		11:57
	LANDRUM, BILLIE	52674	11:48					11:48
	TELLIER, ROB	55027-5	11:41	8:29				11:41
	KENT, MICHAEL	F 11	10:27					10:27
	ZUFELT, JAMES	F 5	8:49	7:53	9:30	10:24	10:15	10:24
	BOONE, JACK L.	107857	8:47	8:10	8:40	10:02	8:33	10:02

	CONTESTANT	AMA NO.	0:00	0:00	0:00	0:00	0:00	BEST FLT.
	WRZOS, CHESTER	20450	9:47	7:02				9:47
	VALLEE, THOMAS	1126	9:25	5:33				9:25
	VANDOVER, ABRAM	894	7:48					7:48
	KIRBY, NOEL	267885	3:44	6:13				6:13
	RAYMOND JONES, D.	63358	5:34					5:34
	BARBER, DOUGLAS	56270	ATTEMPT 0.4					ATTEMPT 0.4
	BENNETT, MARK	475698						DNF
	JOHNSON, kENNETH	28705						DNF
	NUZER, JOSEPH	29036						DNF
	RIPLEY, ED	484619						DNF
	SULLIVAN, EDWARD	69585						DNF
	VAN GORDER, WALT	19912						DNF
	WARMANN, ROBERT	18748						DNF

USIC 1997 LIMITED PP #208

	BOONE, JACK L.	107857	7:52	7:36	8:26	7:01	8:38	8:38
	NUSZER, JOSEPH	29036	8:37	5:12				8:37
	LEIFER, LOUIS	F 14	8:24	2:16				8:24
	PERSON, LEE	383504	8:16	0:32				8:16
	OLESON, DOUGLAS	480646	5:22	5:58				5:58
	WILLIAMS, WARREN	5550	2:47					2:47
	BARKER, JOHN	2095						DNF
	BIGGE, WILLIAM R.	L127						DNF
	DOWNS, F.S.	2209						DNF
	JOHNSON, KENNETH	28705						DNF
	WARMANN, ROBT.	18748						DNF

USIC 1997 HELICOPTER # 209

PL.	CONTESTANT	AMA NO.	FLT 1	FLT 2	FLT 3	FLT 4	FLT 5	BEST FLIGHT
1	LOUCKA, LARRY	1210	5:47	8:39				8:39
2	WILLIAMS, WARREN	5550	3:36	3:19	7:27			7:27
3	DIEBOLT, H. J.	97263	5:06	4:59	3:28	5:59	7:26	7:26
	VALLEE, THOMAS	1126	1:07	6:22	7:15	7:10		7:15
	RIPLEY, ED	484619	2:53	3:43	3:57	3:25	6:00	6:00
	LEONARD, N., JR.	497460	4:16	5:23				5:23
	BROCKS, K. PETER	84018	4:33	3:12	5:09	4:56	4:36	5:09
	BIGGE, WILLIAM R	L127	0:20					0:20
	LEONARD, NICK A.	497461						DNF

USIC 1997 ORNITHOPTER #210

PL.	CONTESTANT	AMA NO.	FL 1	FL 2	FL 3	FL 4	BEST FLT.
1	COSLICK, LAWRENCE	4652	5:59	10:49	12:03	16:07	16:07
2	RIPLEY, ED	484619	9:22	14:13	14:44	14:11	14:44
3	WILLIAMS, WARREN	5550	8:59				8:59
	JOSHU, EUGENE	260643	0:59	1:34	6:22	7:06	7:06
	JOHNSON, KENNETH	28705	4:43				4:43
	PURDY, LEN	129	1:19	1:47			1:47
	BIGGE, WILLIAM R.	L127					DNF

USIC 1997 LIMITED PP # 208

	CONTESTANT	AMA NO.	FLT 1	FLT 2	FLT 3	FLT 4	FLT 5	BEST FLIGHT
1	CAILLIAU, LAWRENCE	79985	15:04	15:53	5:43			15:53
2	MCGILLIVRAY, JACK	F 4	5:20	13:43	15:46	15:38		15:46
3	CLEM, JIM	L-55	15:01	9:16	15:19			15:19
4	THOMAS, MIKE	F8	12:12	15:13	14:36	12:22	3:29	15:13
5	VAN GORDER, W.	19912	13:13	15:09	13:53			15:09
6	KOPTONAK, JOHN D.	58027	13:56	14:28	14:56	14:26	13:51	14:56
7	MILLER, RICHARD	179518	4:16	14:49	3:56			14:49
	COSLICK, LARRY	4652	5:32	14:33	13:22	3:22		14:33
	HARTMAN, PHILLIP	8667	11:21	13:41	14:31	14:06	13:59	14:31
	KAGAN, J.		13:30	13:41	14:29	3:23		14:29
	HARDCASTLE, R.	847	12:54	13:06	13:09	14:19	12:29	14:19
	O'GRADY, DAN	F 7	14:19	13:37	14:08			14:19
	MARETT, JOHN	F 13	14:08	13:27	14:16			14:16
	WECKERLY STUART	13250	13:47	14:05	12:58	14:05	4:07	14:05
	WISNIEWSKI, G.	716	13:04	14:04				14:04
	ALVIREZ, PHIL	F15	12:52	12:43	4:22	11:27	13:48	13:48
	OBARSKI, DICK	560	12:16	13:33	12:44			13:33
	LOUCKA, LARRY	1210	13:30	3:58	3:17			13:30
	GANSER, RONALD	7532	13:03	13:00	9:28	13:28	2:15	13:28
	GANSER, JOHN	179424	12:55	13:22	13:26	11:58		13:26
	VONASEK, HOLLY	529113	10:37	11:27	12:40	13:22	2:59	13:22
	GRANT, JIM	159477	11:37	13:15	4:11	0:31		13:15
	HENDERSON, W	F70	3:59	13:13	11:19	13:03	12:01	13:13
	SOVA, TOM	473169	11:13	11:47	12:49	11:23	12:56	12:56
	RAYMOND JONES,D.	63358	10:41	11:56	8:18	11:26	12:52	12:52
	GARDNER, STEVE	6193	5:11	11:30	12:39	12:51	3:34	12:51
	TELLIER, ROB			9:40	10:52	12:49		12:49

	CAWTHORNE, JOHN	560561	12:47	12:20	11:04	11:43		12:47
	BENNETT, MARK C.	475698	9:56	12:43	2:43		10:33	12:43
	VON BUEREN	51477	9:30	12:29	11:56	7:27		12:29
	WALTON, NICK G.	397340	5:44	9:01	11:00	12:19	11::56	12:19
	TELLIER, FRED	F12	10:38	12:00	10:50	11:49	11:56	12:00
	BARR, LAURIE		4:20	11:45	5:12			11:45
	JOSHU, EUGENE	260643	Attempt	11:37				11:37
	BROCKS, K. PETER	84018	11:36	10:21	9:32	9:52		11:36
	VALLEE, THOMAS	1126	10:12	11:31	11:35			11:35
	ZUFELT, JAMES	F5	11:32	11:14	10:54	9:17		11:32
	RASH, FRED	63458	9:04	11:21	5:00	9:26		11:21
	KIRBY, NOEL	267885	5:17	11:18				11:18
	OLSHEFSKY, PETER	F6	6:23	11:11	9:03	10:58	9:15	11:11
	SINGER, LEN	209081	9:58	8:34	9:14	10:59	10:04	10:59
	KENT, MICHAEL P.	F 11	6:29	10:57				10:57
	RIPLEY, EDWARD	484619	8:51	5:53	7:22	10:40	8:29	10:40
	FELLIN, JOHN	95353	10:37	10:15				10:37
	SEAVER, TED	397871	10:31					10:31
	ITALIANO, A.J.	2386	4:58	10:28	9:45	9:26	9:02	10:28
	TENNY, R.	16718	9:30	10:25	10:17			10:25
	LANDRUM, BILLIE	52674	9:32	10:00	9:21	10:17		10:17
	WRZOS, CHESTER	20454	5:42	6:41	7:41	10:14		10:14
	SULLIVAN, EDWARD	69585	8:07	7:47	8:32	10:08		10:08
	PLASSMAN, GERALD	107613	7:02	10:03	9:56	7:15		10:03
	BLAIR, JOHN C.	29698	8:16	9:58	9:16	9:46	9:46	9:58
	VAN DOVER, ABRAM	894	8:07	9:26	9:12	7:10		9:26
	LEONARD, NICK	497461	8:07	9:20	8:46			9:20
	KELLY, JAMES	37564	2:22	5:29	8:05	9:06		9:06
	BARBER, DOUGLAS	56270	8:44	0:17	0:05	0:17		8:44

USIC 1997 KIT/PLAN SCALE #213

PL.	CONTESTANT	AMA NO.	SUBJECT	FIDEL	WORKMAN-	TOTAL	FLT	FLT	FLT	FLT	FLT	TOTAL	COLUMNS C+D
	FLIGHT POINTS CANNOT EXCEED SCALE POINTS			A	B	C						D	
1	MCGILLIVRAY, JACK	1025L		58	39	97	97	97				194	291
2	BLAIR, JOHN	29698		37	38	95	95	95				190	285
3	GRANT, JAMES	159477		59	36	95	95	95				190	285
4	MILLER, RICHARD	179518		56	38	94	94	94				188	282
5	MAC ENTEE, R.	102085		58	38	96	52	71	85	88		173	269
6	MARTIN, JOHN	712		60	20	80	54	85	67			152	232
	HARTMAN, PHILLIP	8667											DNF
	NUZER, JOSEPH	29036											DNF
	RAYMOND JONES,D.	63358											DNF

USIC 1997 ROG STICK # 214

PL.	CONTESTANT	AMA NO.	FLT 1	FLT 2	FLT 3	FLT 4	BEST FLIGHT		
1	LOUCKA, LARRY	1210	13:36	9:44	16:15	17:00	17:00		
2	COSLICK, LAWRENCE	4652	12:20	13:01	16:38		16:38		
3	SOVA, TOM	473169	15:01		13:53		15:01		
	WILLIAMS, WARREN	5550	12:32	10:27	6:24		12:32		
	DIEBOLT, H.J.	97263	4:37	4:21	9:12		9:12		

USIC 1997 CABIN ROG # 204

PL.	CONTESTANT	AMA NO.	FLT 1	FLT 2	FLT 3	FLT 4	FLT 5	BEST FLIGHT
1	THOMAS, MIKE	F66	8:53		18:18	20:24	28:16	28:16
2	LOUCKA, LARRY	1210	22:12	28:07				28:07
3	GANSER, RON	7532	21:15	24:14				24:14
	LEONARD, NICK A.	497461	6:56					6:56
	LEONARD, N. JR.	497460	6:00					6:00
	BIGGE, WILLIAM R.	L127						DNF
	DIEBOLT, H. J.	97263						DNF
	GRANT, JIM	159477						DNF

USIC 1997 BOSTONIAN # 215

PL.	CONTESTANT		FLT 1	FLT 2	FLT 3	FLT 4	FLT 5	BEST 2	CHARISMA	TOTAL
1	COSLICK, LARRY	4652	5:04	5:13	5:19	5:34	5:15	10:53	1.20	783.6
2	THOMAS, MIKE	1964L	4:31	5:09	5:25	5:41	5:01	11:06	1.15	765.9
3	MILLER, RICHARD	179518	3:46	5:05	5:19			10:24	1.16	723.84
4	GRANT, JAMES B.	159477	4:31	4:49	3:07	5:00		9:49	1.17	689.13
5	MARETT, JOHN	651L	4:01	4:12	1:49	4:37	4:38	9:15	1.11	616.05
	BARKER, JOHN	2095	2:11	4:12	3:11	4:57	2:09	9:09	1.11	609.39
	SEAVER, TED	397871	3:12	3:15	3:43	3:31	3:03	7:14	1.10	477.4
	HENDERSON, W.	1336L	4:07	2:50	1:41			6:57	1.14	475.4
	OBARSKI, R. W.	560		3:33	3:42			7:15	1.06	461.1
	WECKERLY, STUART	13250	2:54	3:05	2:17	2:43	3:39	6:44	1.11	448.44
	KENT, MICHAEL	9784	2:53	3:00	2:55	3:09		6:09	1.09	402.2
	CAWTHORNE, JOHN	560561	2:56	2:43	2:49			5:45	1.16	400.2
	PLASSMAN, GERALD	107613	0:39	2:37	2:16			4:53	1.07	313.51
	VON BUEREN, KARL	51477	1:25	1:46	0:10	1:15	1:36	3:22	1.17	236.3
	VAN DOVER, ABRAM	894	0:37	0:38	1:07	1:10	1:13	2:23	1.10	157.3
	WIECZOREK, L.H.	10105	1:16						1.00	76
	BLAIR, J.	29698							1.10	
	MAC ENTEE, R.	102085							1.12	
	NUZER, JOSEPH	29036							1.18	
	PLASSMAN, JEFF	PENDING							1:04	

USIC 1997 MINI-STICK # 220

PLACE	CONTESTANT	AMA NO.	FLT 1	FLT 2	FLT 3	FLT 4	FLT 5	BEST FLIGH
1	CAILLIAU, L.	79985	13:10					13:10
2	WALTON, NICK	397340	9:18	8:29	11:56	2:31		11:56
3	COSLICK, LAWRENCE	4652	10:17	11:45	10:06			11:45
4	ALVIREZ, PHIL	F15	10:26	11:28	11:18	11:42	2:56	11:42
5	BENNETT, MARK	475698	1:09	7:50	11:40			11:40
6	CLEM, JIM	L55	11:39	10:12	9:35			11:39
7	BARR, LAURIE		9:33	10:41	11:36	11:04		11:36
8	VAN GORDER, W.	19912	10:53	11:13				11:13
9	GANSER, RONALD	7532	11:08	7:21				11:08
10	O'GRADY, DAN	F7	7:30	9:49	10:04	11:04		11:04
	OBARSKI, DICK	560	8:47	10:26	9:24	10:04		10:26
	KOPTONAK,JOHN	58027	8:28	8:33	10:23			10:23
	TENNY, R/	16718		8:53	10:20			10:20
	TELLIER, FRED	F12	9:42	10:09	9:08	10:06		10:09
	HARDCASTLE, R.	847	9:58	3:58				9:58
	SOVA, TOM	473169	9:25	9:14	8:54			9:25
	RAYMOND JONES, D.	633358	6:14	7:31	8:11	9:03		9:03
	GANSER, JOHN	179424	7:22	8:36	7:24			8:36
	BARKER, JOHN	2095	8:34	8:26	8:23	2:24		8:34
	SEAVER, TED	397891	8:11					8:11
	CAWTHORNE, JOHN	560561	7:51	6:4				7:51
	SINGER, LEN	209081	6:15	5:53	7:04	7:50		7:50
	BROCKS, K. PETER	84018	6:38	6:46	6:43	7:23	7:34	7:34
	JOSHU, EUGENE	260643	3:44	4:57	7:19			7:19
	PERSON, LEE	383504	7:16	7:12				7:16
	OLSHEFSKY, P.	MAAC 864L		7:15	6:31			7:15
	VON BUEREN, KARL	51477	4:57	7:11	4:31			7:11
	KELLY, JAMES	37564	5:09	6:12	7:04			7:04
	HENDERSON, W.	F70	6:22	4:23	0:10			6:22
	SULLIVAN, EDWARD	69585	0	0	4:38	5:25		5:25
	TELLIER, ROB	55077-J	4:53	5:03				5:03
	CONTESTANT	AMA NO.	FLT 1	FLT 2	FLT 3	FLT 4	FLT 5	BEST FLIGH
	KENT, MICHAEL	F11	2:42					2:42

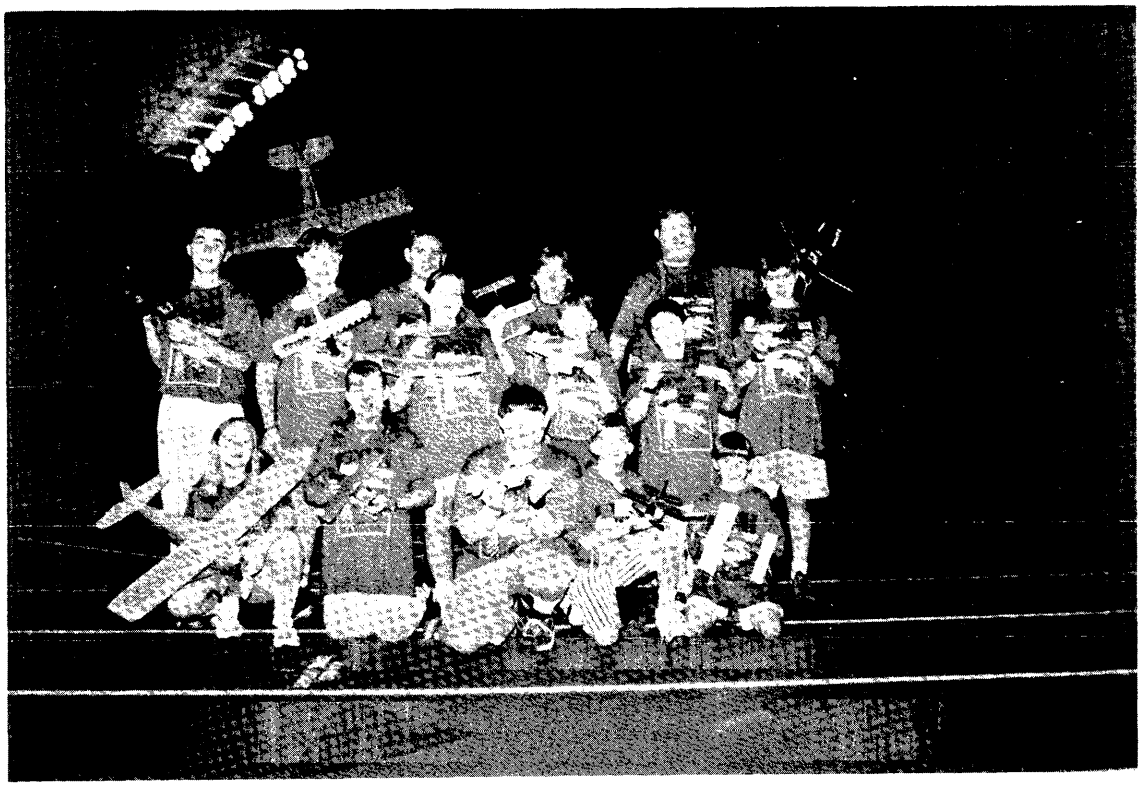
PHOTO CAPTIONS:

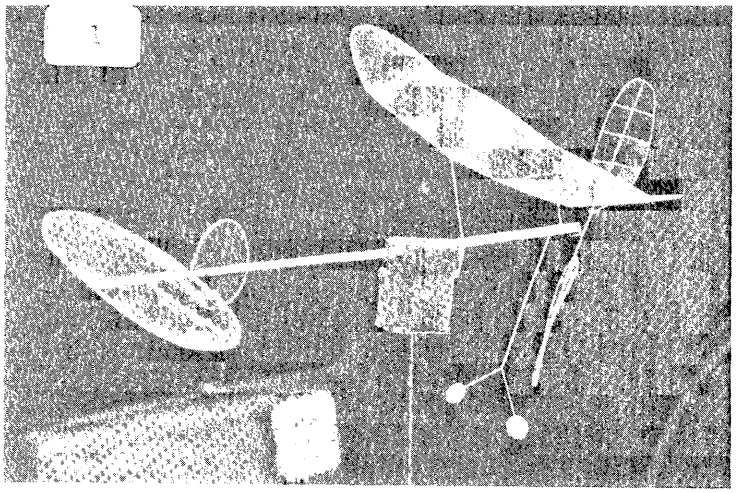
1. Larry Loucka's ROG Stick.
2. Michelle Boyd flew a super General Aristocrat scale model.
   She took a first in Coconut scale and a third in Golden Age scale.
3. Nick Leonard Jr. with a box chocked full of microfilm models.
   He is coming up fast!
4. Rich MacEntee's peanut Turbo Beaver on floats. He brought three of these airplanes
   all in different scales. The pistachio was really incredible to see.
5. Joe Nuszer processing his Intermediate Stick.
6. There was a very close race in Ornithopter this year. Ed Riply and Larry Coslick ran neck and neck right up to the finish in this complex event.
7. John Koptonak with his Grumman F6-F Hellcat he used in the WWII mass launch event
8. Peter Olshefsky sends off his Intermediate Stick.
9. Ron Ganser hamming up at the awards.
10. Fred Rash with his red Autogyro. A very difficult type of model to get to fly well.
11. Gene Joshu launches his Ornithopter for an official. He had structural problems with his model. He also had as much fun as any three other flyers!
12. Dick Hardcastle testing his Intermediate Stick before the serious flying starts.
13. Greg Thomas' beautiful Albatross D-Va rubber scale model.
14. Ken Johnson with his Ornithopter. He also demonstrated an electric endurance model.
15. Fred Teller from Canada repairs the bracing on his F1D.
16. Larry Cailliau makes some repairs to the propeller of his EZB.
17. Larry Coslick receives the Don Lindley Memorial Bostonian trophy form the previous years winner, Rich Miller.
18. Ed Riply and his Ornithopter. Ed has really repairs made quick progress in this event, posting a best flight of 14:44 this year. His best time four years ago was less than a minute.

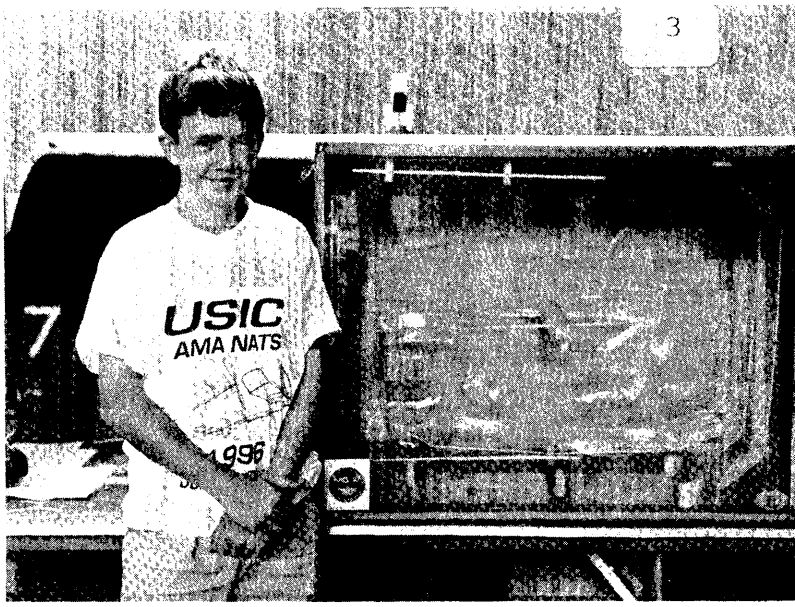
A Note of Apology:

The photos from this years USIC are not up to the standards set by the previous years photos. This is due to a mistake on the part of the photo processor. Ilford XP-2 film, a wonderful black and white film designed to be processed in color chemistry, was used to get the most important photos. The film processor used black and white chemistry on the film, ruining it completely. Most of the endurance modellers and their models were on these ruined rolls, as well as a great number of close-up photos of the best technical innovations. We apologize to the readers of INAV and to those who we failed to include in our photos of this years nats.

TIM LAVENDER'S CHURCH GROUP STOLE THE SHOW AT JOHNSON CITY. HIS GROUP WILL BE BACK NEXT TIME WITH SOME ENDURANCE MODELS.






USIC
AMA NATS


FLYING
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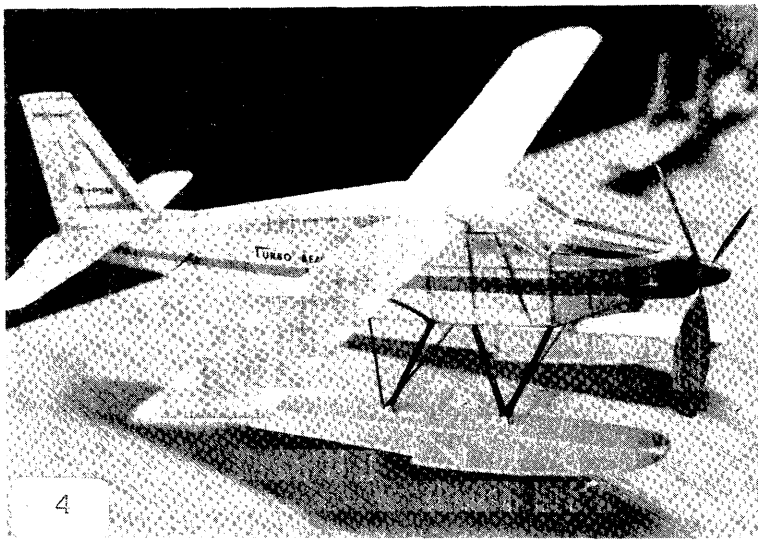

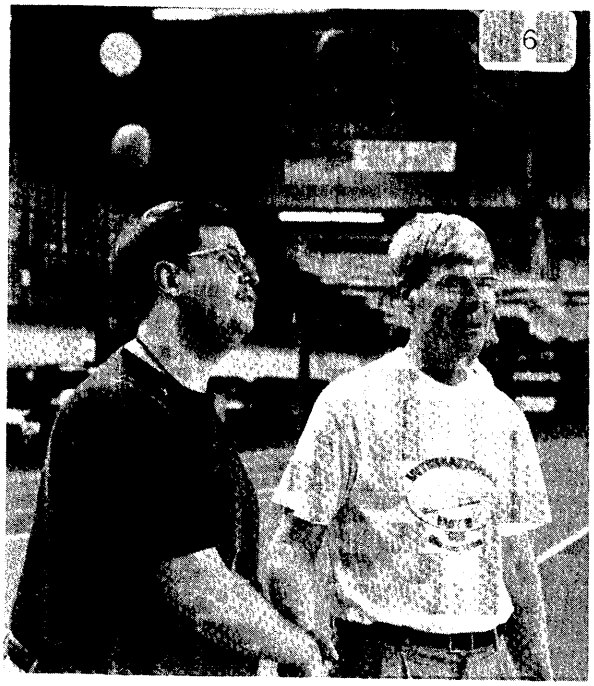
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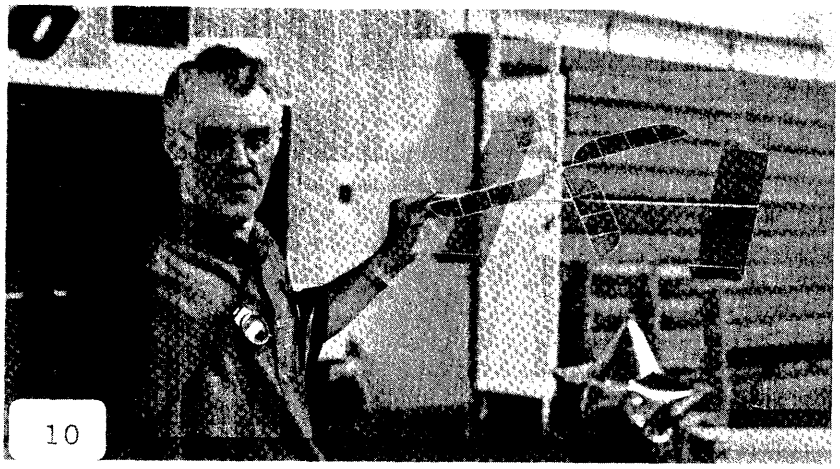
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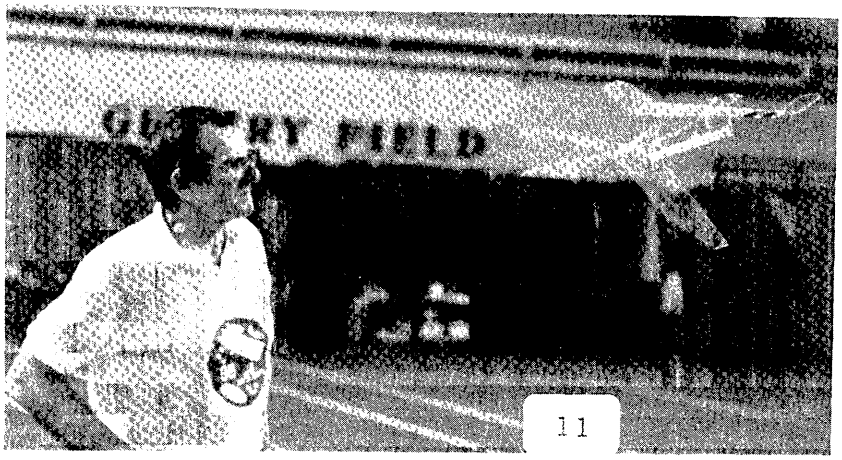

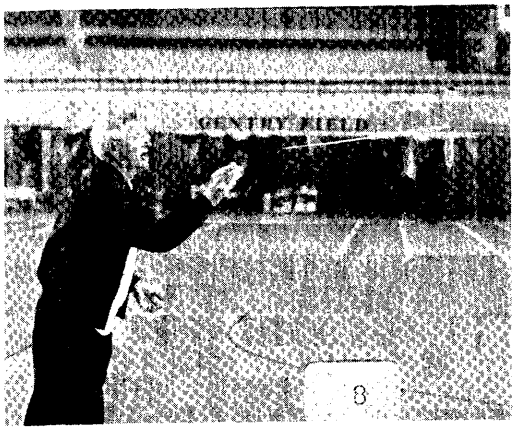

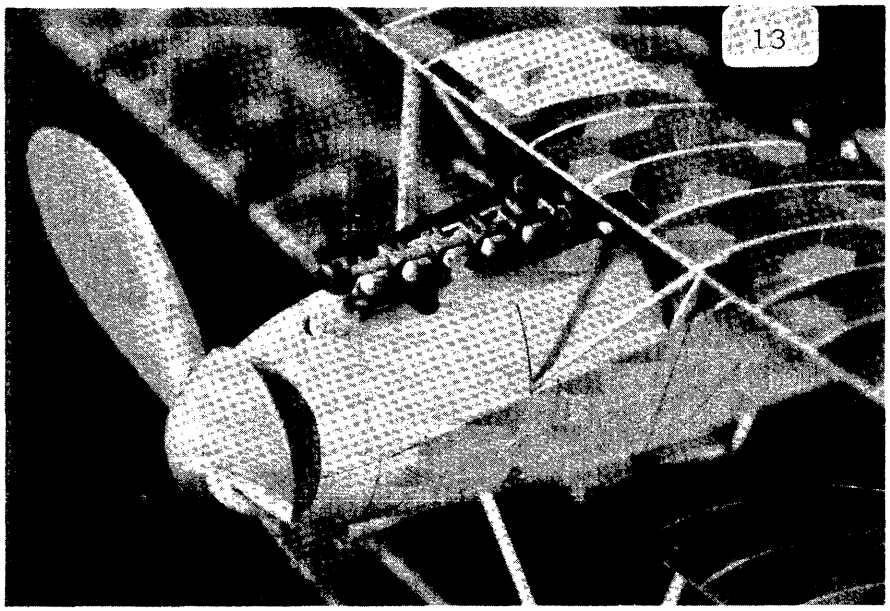
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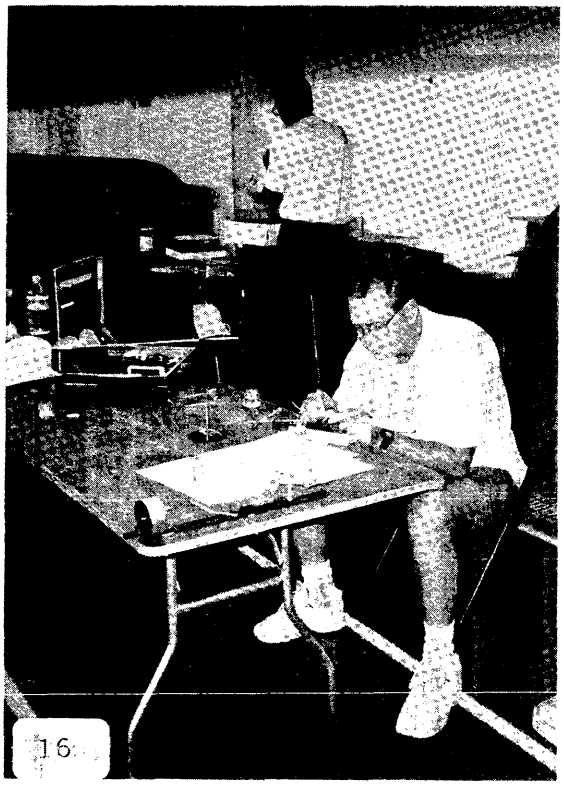
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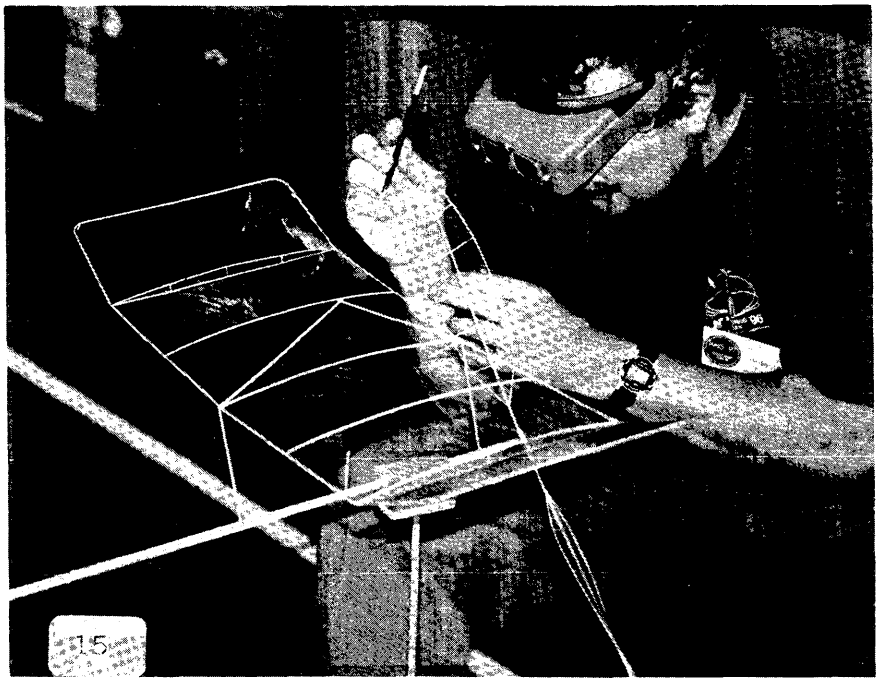
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USIC 1997 STD.CATAPULT G. # 218-OP

PL	CONTESTANT	AMA NO.	FL 1	FL 2	FL 3	FL 4	FL 5	FL 6	FL 7	FL 8	FL 9	BEST FLT.	2ND FLT.	TOTAL 2 BEST
1	PLASSMAN, GERALD	107613	84.2	62.3	78.9	80.7	73.2	51.4	52.2	63.7	73.9	84.2	80.7	164.9
2	VON BUEREN, KARL	51477	74	68.1	76.9	78.3	78.3	78.8	79.5	79.6	79.4	79.6	79.5	159.1
3	SCHLARB, RALPH	322352	76.8	79.5	75.4	77.8	73.2	71				79.5	77.8	157.3
4	FULMER, KEITH	31552	71	73.4	76.8	76.8	69	74.4	73.6	73.8		76.8	76.8	153.6
5	SCHLARB, W. L.	14425	76.2	74.5	75.6	71						76.2	75.6	151.8
6	PERSON, LEE	383504	70.9	71.8	72.6	71.4	76.7	75.1	69.3	71.3	63.2	76.7	75.1	151.8
	KELLY, JAMES R.	37564	69.6	72.7	72.5	70.1	74.1	69.7	75.5	60.5	74.7	75.5	74.7	150.2
	BOEHM, BERNARD	92567	64.6	69.7	70.5	73.4	70	70.2	74.6	71.7	71.2	74.6	73.4	148
	BENNETT, MARK C	475698	56.7	49.7	66.6	67.2	70.4	69.6				70.4	69.6	140
	KOPTONAK, JOHN	58027	55.3	57.1	67.3	64.4	68	66.9	59.3	66.2	63	68	67.3	135.3
	VONASEK, HOLLY M.	529113	43.5	51.7	65.8	63.44	63.7	9.9	57.9	66.3	43.7	66.3	65.8	132.1
	RASH, FRED	63458	61.9	65.9	57.9	61.6						65.9	61.9	127.8
	GANSER, RONALD	7532	55	56	62	64						64	62	126
	CAWTHORNE, JOHN	560561	50.2	63	60.7	57.3	59.9	59.8	48.9	49.1	54.4	63	60.7	123.7
	THOMAS, MIKE	F8	34.9	46.7	54.7	59.8	35.9	57	52.9	57.4	54.8	59.8	57.4	117.2
	KAGAN, JOHN	469254	47.8	47.3	50.1	47.6	51	51.1				51.1	51	102.1
	WECKERLY, STUART	13250	40.5	8	8	41	33.4	15.2				41	40.5	81.5

USIC 1997 UNLMTD CAT. GLIDER #219-OP

PL	CONTESTANT	AMA NO.	1	2	3	4	5	6	7	8	9	BEST FLT	2ND FLT	TOTAL
														BEST 2
1	PLASSMAN, G.	107613	72.8	79.9	79	75.3	72	68.4	70.3	83.4	84.9	84.9	83.4	168.3
2	VON BUEREN, KARL F.	51477	74.4	71	76	76.3	80.9	80	77.3	77.9	58	80.9	80	160.9
3	PERSON, LEE	383504	60.2	59.4	76.3	75.2	74.6	77.4	72	76.1	75.4	77.4	76.3	153.7
4	SCHLARB, RALPH	322352	75.4	76.5	72.2	74						76.5	75.4	151.9
5	FULMER, KEITH	31552	72	74	70	75.2	75	74.8	72.8	74		75.2	75	150.2.
6	SCHLARB, W.L.	14425	75.2	74.7	69	71						75.2	74.7	149.9
7	KELLY, JAMES R.	37564	59.9	64.4	69.5	69.6	64.3	64.8	62.8	69.8	61	69.8	69.6	139.4
8	BENNETT, MARK C	475698	70.1	65.7	65.4	65.8						70.1	65.8	135.9
9	MARETT, JOHN	MAAC651L	47.2	54.3	65.2	58.3	62.1	59.1	64.9	30.1	52.1	65.2	64.9	130.1
10	HENDERSON, W.	F10	40.1	36.1	58.5	59.3	56.2	55	53.5	58.6	55.7	59.3	58.6	117.9
11	WECKERLY, STUART	13250	46.5	39.4	50.1	23.2	51.6	49.4	49.5	40	54.2	54.2	51.6	105.8
12	CAMPBELL, GLENN	15173	42.4	51.4	52.3	51.1	42.1	50	43.8	53	52.5	53	52.5	105.5
13	VANDOVER, ABRAM	894	28.5	34.8	12.8	49.7	42.1	35.9	42.5	41	22.3	49.7	42.5	92.2
	HAUGHT, JIM	3327				DNF								
	JESSUP, ARTIE D.	10269				DNF								
	NISHANIAN, PETER	589435				DNF								
	MARMANN, ROBERT	18748				DNF								

USIC 1997 PEANUT SCALE OPEN #505

PL.	CONTESTANT	AMA NO.	AIRCRAFT	STATIC SCALE TOTAL	FLT 1	FLT 2	FLT 3	FLT PTS	TOTAL PTS
1	GANSER, RONALD	7532	VOISON HYDRO	124	129	122	103	124	248
2	MCGILLIVRAY, JACK	F 4	VOISON HYDRO	128	117	109	111	114	242
3	JOHNSON, KENNETH	28705	VOISON HYDRO	141.75	94	98	101	99.5	241.25
4	THOMAS, GREG	185281	FIKE	125	94	88		91	216
5	MAC ENTEE, RICH	102085	TURBO BEAVER	140	49.8	53.5	47.5	51.6	191.6
6	HENDERSON, W.	1336L	BERIOT 7	92	80	104		92	184
7	KENT, MICHAEL P.	MAC9784	LACY MID	92	70	78	80	79	171
8	PLASSMAN, JERRY	107613	J3 CUB	76	56.7	95.3		76	152
9	KOPTONAK, JOHN	58027	BRISTOL SCOUT	104	33.9	29.7		31.8	135.8
	PLASSMAN, JEFF	PENDING	CORSAIR	78.75					
	MARTIN, JOHN	712	LEMBERGER	87.5					
	MAC ENTEE, R.	102085	SANTOS DUMONT	128.5					

USIC 1997 AMA SCALE #507

PL.	CONTESTANT	AMA NO.	SUBJECT	1	2	3	BEST FLT.	2ND FLT	AVG. BEST 2	TIME PTS.	SCALE PTS.	TOTAL PTS.
1	GANSER, RONALD	7532	ORIG. CESSNA	110	123		90/123	90/110	90	90	95	185
2	MCGILLIVRAY, JACK	F4	SE5-A	114	115		90	90	90	90	94	184
3	JOHNSON, KENNETH	28705	CESSNA O-1	75	93	92	90/93	90/92	90	90	85.5	175.5
4	MILLER, RICH		CORDIE WOT	83	113	99	90	90	90	90	82	172
	THOMAS, GREGORY	185281	PIPER J-3	73.5	76.1	78	78	73	75.5	75.5	95	170.5
	GRANT, JAMES B.	159477	CLA-3	71	55	81	81	71	76	76	92	168
	WECKERLY, STUART	13250	FOUND	102	91		90	90	90	90	78	168
	KOPTONAK, JOHN	58027	ALCO	72	62		72	62	62	62	84	146
	BLAIR, JOHN	29698	RUSSEL								95	95

USIC 1997 AUTOGIRO # 211

PL.	CONTESTANT	AMA NO.	FLT. 1	FLT. 2	FLT.3	FLT. 4	FLT. 5	BEST FLIGHT
1	GANSER, RONALD	7532	12:54	12:58				12:58
2	DIEBOLT, H. J.	97263	8:46	10:18	10:45			10:45
3	RASH, FRED	63458	0:49	5:10	5:54	5:10	5:11	5:54
	BROCKS, K. PETER	84018	2:23	4:55	3:25			4:55

USIC 1997 COCONUT SCALE

PL.	CONTESTANT	TIME	SCALE	TIME PTS	TOTAL
1	BOYD, MICHELLE	2:57	2	1	3
2	REES, DAVE	1:34	1	4	5
3	LAVENDAR, TIM	2:42	3	2	5
4	KOPTONAK, JOHN	1:51	1	6	7
5	WECKERLY, STU	2:24	5	3	8
6	MARTIN, DOC	2:06	5	5	10
7	ANDERSON, KEN	:22	4	8	12
8	LANDRUM, BILLIE	1:47	6	7	13
	MAC ENTEE, RICHARD		5		

USIC 1997 PASTACHIO SCALE

PL.	CONTESTANT	MODEL	SCALE	FLY 1	FLY 2	FLY PTS.	TOTAL PTS.
1	*Lavender, Tim	MESSERSCHMITT	5	1:25	2:25	1	6
2	Martin, John B.	GOLD WING	4	1:19	1:24	3	7
3	Mac Entee, R.	LACEY	1	0:32		7	8
4	Mac Entee, R.	BEAVER SEAPLANE	2	0:31		6	8
5	Miller, William E.	SPERRY JENNY	6	1:24	1:28	2	8
6	Ripley, Ed	FACETMOBILE	3	0:18	0:05	8	11
7	Ripley, Ed	WEE BEE	8	1:15	1:17	4	12
8	Martin, Doc	WINDHAM	9	0:44	0:48	5	14
	Rees, Dave	LACEY	5				
	Ripley, Edward	SPERRY JENNY	7				
	Johnston, John						
	Plassman, G.						
	Plassman, J.						
		Fly: Best 2 of 9					
		*TROPHY AWARDED					

USIC 1997 F.R.O.G.

PLACE	CONTESTANT	FLT 1	FLT 2	FLT 3	FLT 4	FLT 5	BEST FLIGHT
1	SEAVER, T.	5:25	2:05	5:01	6:38	7:30	7:30
2	SOVA, T.	6:45	6:00	6:49	7:03	6:17	7:03
3	HENDERSON.W	6:22	6:33	6:34	2:25	6:48	6:48
	RASH, F.	6:44	5:50	6:18	5:26		6:44
	RIPLEY, ED	5:00	4:37				5:00
	DIEBOLT, J.	4:25	4:47	3:39			4:47
	CLEM, JIM	2:44	4:09				4:09
	TENNY, BUD	1:41	3:57				3:57

USIC 1997 PRO 20

PL.	CONTESTANT	AMA NO.	FLT 1	FLT 2	FLT 3	BEST FLIGHT
1	LOUCKA, LARRY	1210	26:15	28:19	28:06	28:19
2	SOVA, TOM	473169	25:30	23:28		25:30
3	HENDERSON, W.	MAAC1336L	16:22	15:44		16:22
	WILLIAMS, WARREN	5550	7:07			7:07
	PHILLIPS, W.	9088				DNF
	COSLICK, LARRY	4652				DNF

USIC 1997 UNLIMITED RUBBER SPEED

PL.	CONTESTANT	AMA NO.	0:00	0:00	0:00	4	BEST
1	COSLICK, L.	4652	6:37	5:93			5:93
2	SOVA, TOM	473169	8:78	8:12	8:06	7:91	7:91
3	HENDERSON, W.	1336L	8:81				8:81

USIC 1997 GOLDEN AGE (3 min. max) ALL 45 PTS.

CONTESTANT	MODEL	FLIGHT 1	FLT 2	FLIGHT 3	TOTAL 3 FLTS	PLACE
Marett, John	DH Moth	167	180	180	527	1
*Lavendar, Tim	Verville Aircoach	165	180	174	519	2
Boyd, Michelle	Genl Aristocrat	165	172	157	494	3
McGillervray, Jack	Cessna	156	153	180	489	4
Miller, R.	Taylorcraft	124	131	121	376	5
Weckerly, Stu	Ford 2AT	121	140	105	366	6
Kaptonak, John	Fairchild Ranger	127	115	94	336	7
Blair, John	Cub J3	93	96	102	291	8
Rees, DAve	Nicholas Beasley	118	134		252	9
Rees, Dave	Genl Aristocrat	129			129	10
Anderson, Wayne	Verville Aircoach	6			6	11
(All 45 Points)	3 Minute Max.					DNF
Mac Entee	Waco E					DNF
Martin, John	Domier, Komet					DNF
Weckerly, Stu	Stinson 105					DNF
	* TROPHY AWARDED					

USIC 1997 35 CM

PL.	CONTESTANT	AMA NO.	FLT 1	FLT 2	FLT 3	FLT 4	FLT 5	BEST FLIGHT
1	SOVA, TOM	473169	13:00	17:35	21:12			21:12
2	VALLEE, THOMAS	1126	17:50	19:19	19:32	19:49	6:39	19:49
3	HENDERSON, W.	MAAC 1336L	0:55	16:42				16:42
	FELLIN, JOHN	95353	12:20	16:05	11:42	14:48		16:05
	WILLIAMS, WARREN	5550	8:26	12:42	4:10			12:42
	BARR, L.		12:24	6:57				12:24
	ZUFELT, JAMES	F59	11:43					11:43
	RAYMOND-JONES,D.	63358	11:03	9:28				11:03
	OLSHEFSKY, P.	MAAC864L	7:05	9:12				9:12
	LANDRUM, B.	52674						DNF
	NUSZER, J.	29036						DNF
	O'GRADY, DAN	F57						DNF
	VAN DOVER, ABRAM	894						DNF

USIC 1997 FAC WW2

CONTESTANT	MODEL	SCALE SCORE	FLT 1	FLT 2	FLT 3	SCORE	BEST FLT. TOTAL	PLACE
						BEST FLIGHT	SCALE &	
McGILLIVRAY	SPITFIRE	61	125			120	143.5	1
MILLER, R.	ZERO	62	81.5			81.5	133.5	2
KOPTONAK, J.	HELL CAT	58	69	83	80	80	130	3
MARTIN, J.	ME 109	46	68.4	81.5	98.9	98.9	123.25	4
MAC ENTEE, R.	P-51	59	68			68	123	5
HISCOCK, B.	P-51	44.5	35.8	29		35.8	80.5	6
MASS LAUNCH:	McGILLIVRAY, J.							
	ANDERSON							
	KOPTONAK							

USIC 1997 LEGAL EAGLE

PLACE	CONTESTANT	BEST 3 OF 4	AIRCRAFT	SCORE
1	OBARSKI, R.	3:36, 5:27, 5:27	SIMPLE EAGLE	870
2	SEAVER, TED	5:18, 533, 5:34	DOUBLE JEPARDY	850

USIC 1997 HIGH WING MONOPLANE

NAME	STATIC	FLT 1	FLT 2	FLT 3	TOTAL	PLACE
WECKERLY, STU	59.5	120 MAX			82.5 + 59.5 = 142	1
AMA 185281 Greg Thomas	62	84	93	90	76.25 + 62 = 137.25	2
BLAIR, JOHN	46	93	83	44	75.25 + 46 = 121.25	3
MAC ENTEE, RICH	55.5	39	59		55.5 + 59 = 114.5	4
MARTIN, DOC	31	60	85		31 + 67.5 + 98.5	5

USIC 1997 NO-CAL SCALE

CONTESTANT	FLT 1	FLT 2	FLT 3			BEST FLT.	PLACE
DIEBOLT, J.	7:37					7:37	1
OBARSKI, R.	5:47	0:43	5:15	6:44	6:44	6:44	2
LOUCKA, L.	5:45	6:01	4:46	6:36		6:36	3
HENDERSON	4:12	4:54	5:30	5:21	6:20	6:20	
SEAVER, T.	2:57	5:20	5:39			5:39	
NUNZER, J.	5:35	3:04	2:45			5:35	
GANSER, J.	5:03	5:24	5:23			5:24	
VON BUEREN, K.	3:34					3:34	
VAN DOVER, L.	2:47	3:00	0:55			3:00	
O'DELL, B.	1:26	1:37	1:44			1:44	
BOONE, J.	1:26					1:26	

1997 MODERN CIVIL PRODUCTION (45 pts. min. to fly)

CONTESTANT	MODEL	FLIGHT 1	FLIGHT 2	FLIGHT 3	TOTAL 3 FLTS	PLACE
	*ALL 45 PTS. - 2 MIN. MAX					
WECKERLY, STU	FOUND CENT.	2:33	2:03	2:19	6:55	1
MARTIN, DOC	MESSER M20	2:04	1:45	2:06	5:55	2
THOMAS, GREG	PIPER VAGABOND	0:78	0:42	0:75	3:15	3
JOHNSON, KEN	CESSNA O1	0:86			1:26	4
REES, DAVE	BEUANCA DECATH	0:55			0:55	5
MAC ENTEE, R.	TURBO BEAVER					DNF
THOMAS, GREG	CLIPPED CUB					DNF

USIC 1997 DIME SCALE

PL.	CONTESTANT	TOTAL BEST 3 UNLMT	AIRCRAFT
1	McGILLIVARY	7:16	COMET ARADO
2	MILLER, RICH	6:58	COMET PUSS MOTH
3	MARTIN, DOC	5:42	NEWPORT 17
4	MARTIN, DOC	2:54	COMET ME109
5	WECKERLY, STU	2:35	STINSON 105
	HISCOCK, BILL	DNF	COMET DVII
	MAC ENTEE, RICH	DNF	COMET ROBIN

1997 AMA NATS

OVERALL INDOOR SCORES

CONTESTANT	TOTAL
Larry Coslick	91
Mike Thomas	56
Jack McGillivray	50
Ronald Ganser	46
Laurie Barr	39
James Grant	32
Warren Williams	31
Lawrence Cailliau	29
Larry Loucka	29
Gerald Plassman	29
Richard Miller	26
Walt Van Gorder	25
Karl Von Bueren	25
H J Diebolt	23
John Kagan	22
Jim Clem	21
Kenneth Johnson	21
Richard Doig	18
John Koptonak	16
John Marett	15
Ed Ripley	15
Ralph Schlarb	15
Tom Sova	15
Fred Tellier	15
Keith Fulmer	13
Nicholas Leonard Jr	13
Lee Person	13
Gregory Thomas	13
Bernard Boehm	12
Richard Mac Entee	12
Mark Bennett	11
K Peter Brocks	11
Dan O'Grady	11
Peter Olshefsky	11
W L Schlarb	11
John Blair	10
Richard Hardcastle	10
Leonard Surtees	10
Nick Walton	10
Phillip Alvirez	9
W Henderson	9
William Hulbert	9
Edward Burke	8
Robert Eberle	8
James Kelly	8
Fred Rash	8
John Barker	7
Phillip Hartman	7
Eugene Joshu	7
Nick Leonard	7
Thomas Vallee	7
Stuart Weckerly	7
Gordon Wisniewski	6
John Martin	5
Len Purdy	5
Michael Kent	4
Ted Seaver	4
William Bigge	3
Rob Tellier	3
R W Obarski	2
D C Raymond Jones	1

New PM2L Plastic Covering Material

By Dick Obarski

The weight loss factor (approx. 2/1) of using PM2L vs. Microfilm is a deterrent, but dimensional stability, puncture and shock resistance are much better, all of which would minimize problems of shipping and handling models.

SPECIFICATIONS

	Weight. In oz. Per* 100 sq in.	Thickness in inches
Ultra Film (Ray Harlen)	.0045	.00006
Ultimate (Wayne Trivin)	.00366	.000047
PM2L	.00271	.0000353
Microfilm	.0015 Appx.	Varies

* above weights determined using a Harlen beam scale. Weight for microfilm varies depending on sheet color after pouring.

PM2L - USA pricing $15.00 - 15 ft.- P.Paid

Send to: R. W. Obarski
2112 N. Halcyon Drive
Sun City Center, FL 33573

Indoor Plastic Film

Dick Obarski suggest that you can remove the static from your film by wrapping a Kling Free Laundry strip around the white protective paper on the film roll. Then place the whole thing back in the mailing tube for one week.

AIRBRUSHING SCALE MODELS

Written and Illustrated by Steve Gardner

If you fly free flight scale models you have wished that Japanese tissue was available in a greater number of colors. About a million different colors would be about right to "cover "all the possibilities, but instead we have only the wrong red, the wrong blue, the wrong green ,the wrong orange, the wrong yellow, black, and white. And the black is not dark enough nor the white light enough to get perfect results. Grass green Spitfires, lemon yellow J-3 Cubs, white Mustangs, and all manner of other mis-colored models stab the eye at flying This sessions and contests. Seven colors , thousands of different airplanes" ! What to do?!?!

The obvious thing to do is paint our models. There are our millions of colors. White lettering on black with no fade through. Browns! Purples! Grays! Anything you want! Anything at all except light models. Paint weights a ton. Not only that, but it is heavy , too! You would think that they ground up rocks and metals to get the colors into the paint. Scale models, especially indoor models, really become dogs when the weight goes up. If you paint a model and it gains 25% in weight, it will need 57% more thrust to fly. means more rubber, which means even more weight, and soon you have a nice shelf model. Now what?

Railroad modelers to the rescue! The various paints made to suit those very discriminating guys with train-brains have some great features for us as well. The detail on those little trains is very fine and easily covered over with ordinary paints, so the train guys developed paints with extremely finely ground pigments(the rocks and metals) that could be applied very, very thinly and still cover. This thin paint will not hide the fine details and it will almost always work with a single coat. Thin paint films for them, light paint jobs for us!

The best way to apply this wonderful paint is with an airbrush. If you do not get a thin, even cover then the paint will weight too much or be splotchy and patchy where it is too thin. The airbrush is perfect applying this paint since it puts out a very fine spray with extreme control. It is also economical. One ounce of paint will cover an incredible area when applied with an airbrush.

Which kind of airbrush do I want?

There are three basic kinds of airbrush that you can pick from. Which kind you choose will depend on how much you wish do with the brush. The three kinds are:

Single Action , External Mixing (see drawing)

Single Action, Internal Mixing (see drawing)

Double Action (see drawing)

The first type, single action with external mixing, is the cheapest, and least versatile airbrush available. It is OK to apply a thin coat of paint to a model or a sheet of stretched tissue, but is not good enough for many of the detailing uses I will describe later. The better models of this type do a fair job and this may be all you need. They are very easy to use and clean.

The second type, single action with internal mixing, is a better choice for very basic airbrushing than the first type, and really doesn't cost too much more. This type of airbrush is fine for all but the most special detail painting. This type is very easy to use and fairly easy to clean.

The third type, double action, is the traditional artist's airbrush. It will take a bit of practice to use, and can be a real pain to clean, but the things that can be done with this tool are incredible. This is the most expensive type recommended for model use, but even this type can be had for under seventy dollars for a set including the air hose.

Painting covered models:

If you are trying a camouflage paint scheme, or a scheme that does not lend itself to colored tissue, you will probably cover the model with white tissue and use paint to color. A large, strong model will allow the weight of shrunken and doped tissue. To paint the doped tissue you can use acrylic or enamel paints. The flat enamels are most probably the lightest , but acrylics can also give a very light finish and do not smell as bad. The paint should be very thin, so add the proper thinner until the paint is the consistence of milk. This will let the paint atomize very finely and cover with a bare minimum of weight buildup. Paint the lighter colors first, then the darker colors. If you have any red white and blue markings to paint always start with a white base, so the other colors are very bright. If the model is not doped but has shrunken tissue, then the paint should be an acrylic, and it should be thinned even thinner than otherwise. If the tissue is to be left loose, then you should paint with an enamel to hold down the shrinkage. It is almost impossible to mask on raw tissue, so if you have a complex color scheme you should dope the model. The dope can be airbrushed as well as the paint.

Painting tissue:

If you are building a smaller model or want the very lightest painted finish for a model built too lightly to take tissue shrinking you should paint the tissue before covering the model. Plan on using white glue to attach the tissue since the paint will lift if you use dope. You can sometimes get away with an acrylic under dope, but test first. Stretch the tissue on a good strong frame with corner reinforcements so you do not get wrinkles. The paint is again thinned to the consistency of milk and is sprayed on as evenly as you can manage. Do not try for complete coverage, go for a consistent tinting of the tissue. If you are using acrylics the tissue will go limp as the paint wets it. Do not go over the

really wet, limp areas with more paint because it will collect in the wrinkles. You should use a color of tissue close to the target color. I use black tissue for my silver painted models because silver goes over black without stray light making the paint thickness variations stand out. A very thin coat of silver will make black tissue look great! You can iron the tissue to get it flat once it is off the frame. Be careful to not use too much heat, especially on the acrylic paints. Keep the scraps of painted tissue to use for patching the model.

Masking:

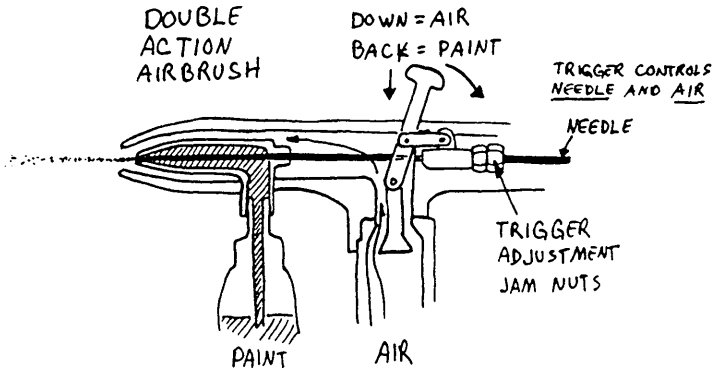
It is a bit of a challenge to mask for differing color areas on something as soft surfaced and delicate as a rubber scale model. You can't rub the mask down onto the surface, and the adhesive used to attach the mask must be weak enough to allow the removal of the mask without stretching or tearing the tissue on the model. I have tried a great number of materials with varying degrees of success. By far the best thing I have found is newsprint style paper adhered to the model with the glue stick made by Scotch called "Post It", or by "Sprayment 77" spray adhesive. The glue stick is made with an adhesive designed to allow clean removal . It is low enough tack to get loose from most tissue surfaces, and the mask can often be reused without additional glue. If the mask proves stubborn, then just a touch of water on the mask above the stuck spot will lift it right up. The sprayglue is a different matter. It will stick the mask on in what appears to be a very permanent way, but after you have painted the masked area and allowed it to dry, you can remove the mask by applying naphtha to the mask material. A bit of naphtha on a Q-tip will get any stray bits of glue off the model. Just cut the mask out of good newsprint paper and apply the glue to its underside. If you are using spray glue be very careful when positioning the mask because it will really grab the model when it gets the chance.

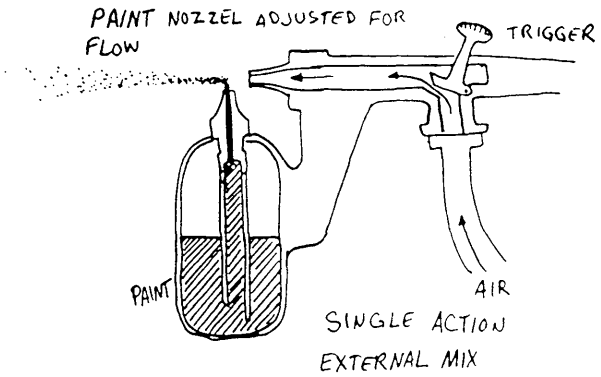
Detailing:

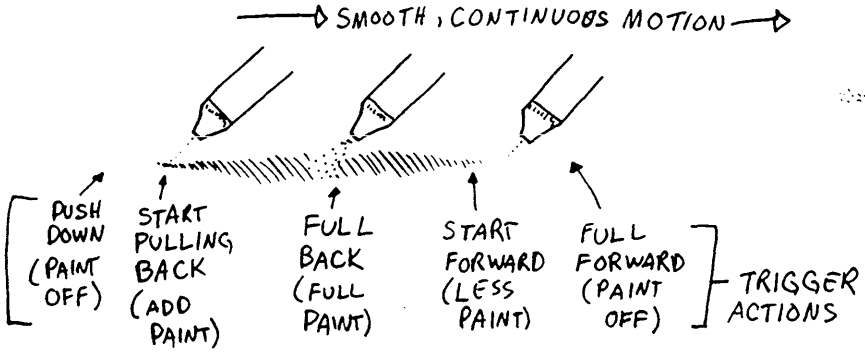
Exhaust smears, gun powder smears, weathering, and panel separations are all easy to do with an airbrush. A good double action brush can lay down a 1/32 width paint line once you are practiced with it. Soft edged areas of color are easy to do and very good camouflage schemes can be done without any masking at all even on something as small as a peanut or pistachio. The double action brush will allow you to vary the flow of paint infinitely. This ability to throttle the amount of paint being sprayed give this tool a wonderful versatility. Beautiful, soft exhaust stains can be painted with a very high degree of realism. Masked panel lines can be added with just the very faintest of suggestions of color, giving the models surface a great deal of depth. This type of airbrush is a hobby in itself! You will have a bunch of fun learning this tool and other applications will suggest themselves to you almost instantly.

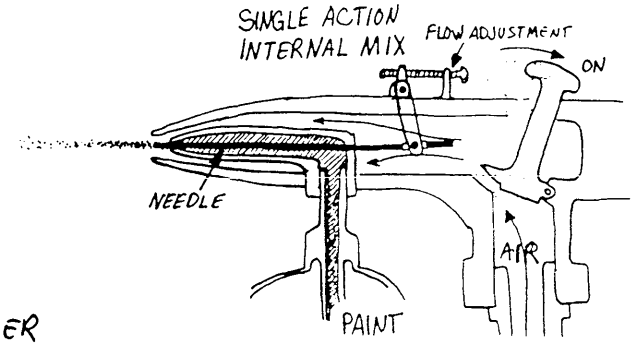
Places to get neat AIRBRUSH stuff!

1. **Artgraphix** at 1-800-443-4421 they have all kinds of good stuff like Paasche airbrushes and good compressors.
2. **Badger airbrush company**
   9128 W. Belmont Ave
   Franklin Park, IL 60131 They sell very good airbrushes
3. **The Airbrush Store** at 1-800-852-7874 They sell several kinds of good airbrushes.
4. **Jerry's Artarama** at 1-800-U-ARTIST They sell everything! Lots and lots of neat stuff! Ink, dye, paints, the whole shooting match!



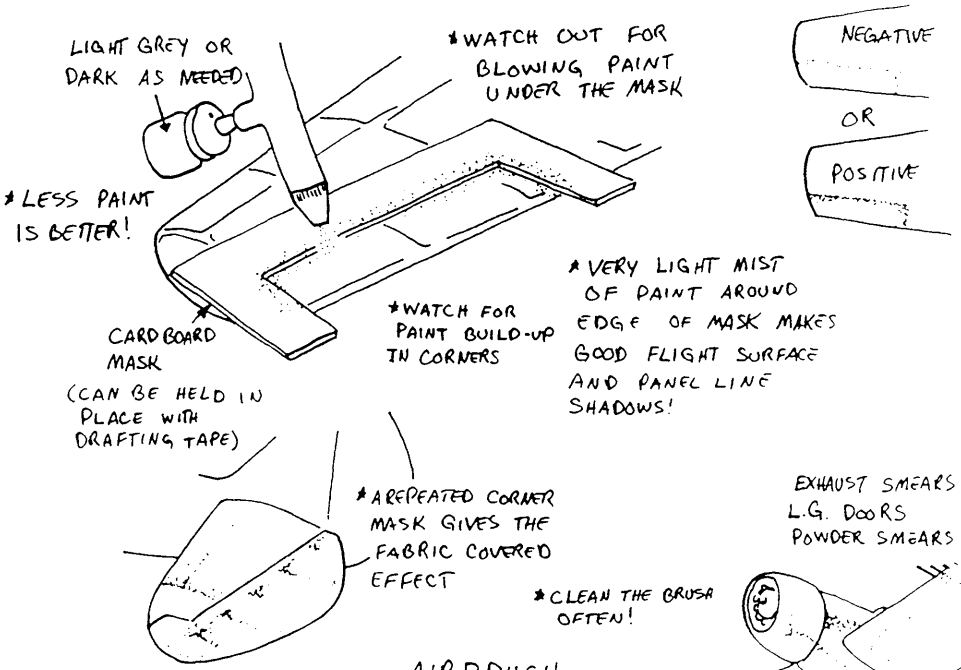






* NEEDS PRACTICE!
* VERY VERSATILE!

THE "DAGGER" STROKE GIVES A FULL WIDTH LINE WITH SOFTLY TAPERED ENDS. GREAT FOR EXHAUST EFFECTS!



1997 ministick Postal Contest

Name	Country	Time	Filing--	Corr. factor	Corr. time	STANDING
VanGorder, Walt	USA	598	23.4	1.609680412	962.5888865	1st overall
Collins, Walt	USA	438	8.166	2.100850304	920.1724334	1st USA
Danjo, Akihiro	JAPAN	527	24.23	1.593674922	839.8666839	1st International
Clem, Jim	USA	519	23	1.617612628	839.5409539	2nd USA
Brooks, Peter	USA	390	8.166	2.100850304	819.3316188	3rd USA
Mzik, Larry	USA	485	20	1.682235827	815.8843759	
Platt,Bob	USA	386	8.166	2.100850304	810.9282175	
Keller, Peter	SWITZ	377	8.04	2.10804124	794.7315476	2nd International
Z Fujiwara	JAPAN	528	29.52	1.503854509	794.0351809	3rd International
O'Grady, Dan	CANADA	484	25	1.579345088	764.4030227	
Tenny, Bud	USA	421	16	1.786324786	752.042735	
Shigezoshi, Nonaka	JAPAN	471	24.23	1.593674922	750.6208883	
Hua-Nboc, Trung	FRANCE	485	27.55	1.535089532	744.5184232	
Slusarczyk, Don	USA	439	20	1.682235827	738.5015279	
Shigeyoshi, Nonari	JAPAN	461	24.23	1.593674922	734.684139	
Toru, Yatabe	JAPAN	488	29.52	1.503854509	733.8810005	
S Miuya	JAPAN	488	29.52	1.503854509	733.8810005	
Sadayoshi, Tomita	JAPAN	485	29.52	1.503854509	729.369437	
Raymond-Jones,Collin	CANADA	461	25	1.579345088	728.0780856	
Hoffman, Earl	USA	425	18.75	1.712245332	727.704266	
Gardner, Steve	USA	440	22	1.63810595	720.766618	
T Anishi	JAPAN	476	29.52	1.503854509	715.8347464	
Fujiwara, Zuikichi	JAPAN	439	24.23	1.593674922	699.6232908	
M Iida	JAPAN	458	29.52	1.503854509	688.7653653	
Samuelsen, Pete	USA	394	18.75	1.712245332	674.6246607	
Hiroshi, Kurihara	JAPAN	417	24.23	1.593674922	664.5624425	
T Abe	JAPAN	441	29.52	1.503854509	663.1998386	
Someya, Sado	JAPAN	415	24.23	1.593674922	661.3750926	
Hirataka, Iroue	JAPAN	415	24.23	1.593674922	661.3750926	
Akio, Akahoshi	JAPAN	412	24.23	1.593674922	656.5940679	
Shinsuke,Miura	JAPAN	435	29.52	1.503854509	654.1767115	
Olshefsky, Peter	CANADA	414	25	1.579345088	653.8488665	
Sova, Tom	USA	388	20	1.682235827	652.7075007	
Jintaro, Nakao	JAPAN	403	24.23	1.593674922	642.2509936	
Hisao, Tamura	JAPAN	402	24.23	1.593674922	640.6573186	
Matsushita, Tokutaro	JAPAN	412	29.52	1.503854509	619.5880578	
Person,Lee	USA	290	8.166	2.100850304	609.2465883	
VanDever,Abram	USA	283	8.166	2.100850304	594.5406362	
Toru,Onishi	JAPAN	389	29.52	1.503854509	584.9994041	
Kelly,Jim	USA	274	8.166	2.100850304	575.6329834	
Hirotako, Inoue	JAPAN	361	24.23	1.593674922	575.3166468	
Yano, Goro	JAPAN	360	24.23	1.593674922	573.7229719	
Minoru, Iida	JAPAN	378	29.52	1.503854509	568.4570045	
Anthony, Dick	USA	338	22	1.63810595	553.6798111	
Kaneko, Shoji	JAPAN	368	29.52	1.503854509	553.4184594	
Katoh, Yuichi	JAPAN	343	24.23	1.593674922	546.6304982	
Masatomo, Osima	JAPAN	342	24.23	1.593674922	545.0368233	
Tmatsu, Shita	JAPAN	352	29.52	1.503854509	529.3567873	
Minoru, Hukuda	JAPAN	331	24.23	1.593674922	527.5063992	
Grange, Yannick	FRANCE	300	19.52	1.693520615	508.0561846	
Akira, Tachimori	JAPAN	315	24.23	1.593674922	502.0076004	
Tadashi, Abe	JAPAN	333	29.52	1.503854509	500.7835516	
Pontan, Sven	SWEDEN	300	23.08	1.616014436	484.8043308	
Miyazawa, Takeshi	JAPAN	296	24.23	1.593674922	471.7277769	
Leijon, Tomas	SWEDEN	323	32.78	1.456894142	470.5768078	
Someya, Akira	JAPAN	290	24.23	1.593674922	462.1657274	
Halhas, Kai	FINLAND	279	23	1.617612628	451.3139232	
Yochiro, Tkevchi	JAPAN	282	24.23	1.593674922	449.416328	
Hartstein, Daniel	SWEDEN	262	23.08	1.616014436	423.3957822	
Tornkvist, George	SWEDEN	281	32.78	1.456894142	409.3872538	
Komura, Kazumasa	JAPAN	271	29.52	1.503854509	407.544572	
Linden, Lars	SWEDEN	253	32.78	1.456894142	368.5942178	
Sullivan,Ed	USA	137	8.166	2.100850304	287.8164917	
Suzuki, Hideharu	JAPAN	176	29.52	1.503854509	264.6783936	
Martinez, Fernando	SPAIN	91	13.3	1.872993929	170.4424475	
Bellot, Luis	SPAIN	90	13.3	1.872993929	168.5694536	
Schmidt, David	SWEDEN	113	32.78	1.456894142	164.629038	

Akron Light Regains Cat IV World Record

Larry Coslick spent two days at the Akron air lock and on the last flight of the second day, put up a monumental flight of 34:13. His model weighted .535 gram, used a blade forward 13.25" prop and 2960 turns in a loop of 8/93 Tan II 14"X.031".

1997 Mini Stick Postal Contest

An earlier release of the results on the Inter-Net were incorrect. The results are correct as posted in this issue. We made a error in recording Walt VanGorder's flight time in the computer and when the corrections were made, Walt was the overall winner for the fourth straight year. Due to an increased work load and other activities, we will not host the 1998 Mini Stick Postal Contest. Any interested party please contact I.N.A.V.

Wing Bracing Wire

Indoor model supply has a new item, .0005 shiny nichrome wire. It's much easier to see than the standard dull finish. The wire sells for $3.95 a spool.

Indoor Model Supply
Box 5311
Salem, OR 97304

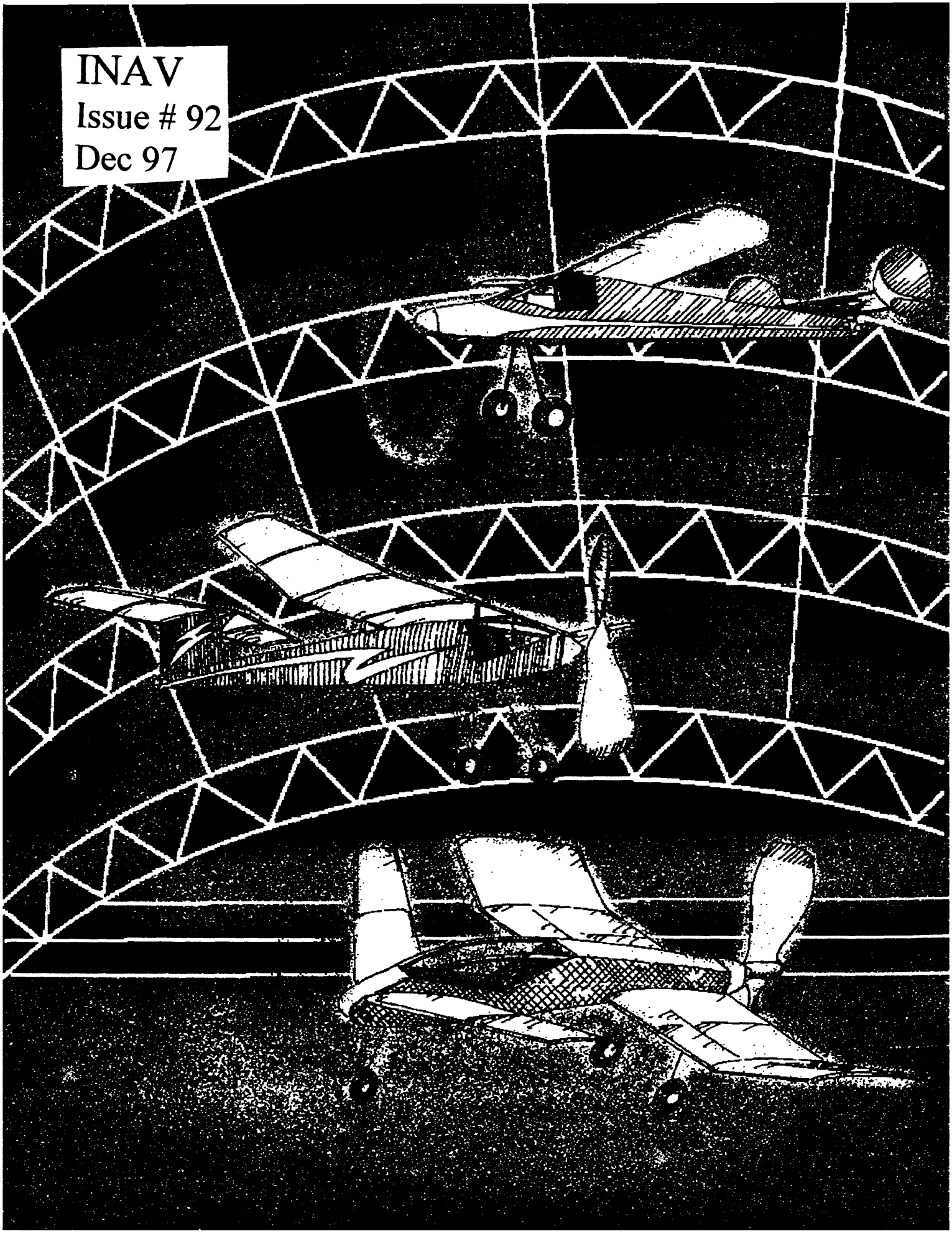
Kibbie Dome
Double Header 1997
Moscow, Idaho

Meet 1 (August 2, 3, 4) Kibbie Dome Annual

All AMA Official Indoor Events. Six official flights per event (which can be flown all three days- 8:00A.M. to 8:00 P.M. Exception: Hand Launch Glider and Catapult Glider flights 8:00 - 9:30 A.M. Special Events: Pro-20, Federation R.O.G., Wingless Autogiro, P-24 & A-6.
Contest Director: Andrew Tagliafico call 503-452-0546

Meet 2 (August 5)
Wally Miller International Easy B Contest

Six rounds to be flown from 8:00A.M. to 8:00 P.M. All A.M.A. rules governing Easy B models to be observed. (No weight restrictions) Timer volunteers are needed.
Entry Fee: $35.00 for each flyer participating (Junior, Senior and Open combined)
Contest Directors : Wally Miller and Larry Coslick


INAV
Issue # 92
Dec 97

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IN ST LOUIS BY LARRY COSLICK, GENE JOSHU,
HOWARD HENDERSON, BILL MARTIN,
STEVE GARDNER, AND ROY WHITE

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THE PRODUCERS ARE LOOKING FOR VOLUNTEERS TO TAKE OVER PUBLICATION OF INAV. ANYONE INTERESTED SHOULD CONTACT HOWARD HENDERSON.

	Contestant	AMA #	1	2	3	4	5	6	7	8	9	Best	2nd	Total	Fin. Pts.	Req. Pts.	Tot. Pts.
1	RICHMOND, Jim	4936	47:18	45:25	46:23	15:54	00:00	00:00	25:15	47:46	49:44	49:44	47:46	1:37:30	1,000.00	100.00	1,100.00
2	RANDOLPH, Bob	5848	24:36	23:19	47:41	00:00	40:51	17:43	48:21	00:00	00:00	48:21	47:41	1:36:02	984.96	100.00	1,084.96
3	COSLICK, Larry	4652	47:18	18:55	43:31	46:55	39:59	37:28	05:55	42:28	48:16	48:16	47:18	1:35:34	980.17	100.00	1,080.17
4	KAGAN, John	469254	12:07	42:21	36:15	46:28	41:06	47:58	47:14	28:51	45:12	47:58	47:14	1:35:12	976.41	100.00	1,076.41
5	BANKS, Cezar	8310	45:36	12:35	00:00	45:33	42:34	13:24	46:36	23:56	47:21	47:21	46:36	1:33:57	963.59	100.00	1,063.59
6	DOIG, Richard	5392	46:11	43:07	15:48	42:33	44:35	45:02	44:29	02:14	06:35	46:11	45:02	1:31:13	935.56	100.00	1,035.56
7	UNDERWOOD, Gary	1314	00:00	45:05	45:58	42:10	41:54	00:00	14:11	00:00	00:00	45:58	45:05	1:31:03	933.85	100.00	1,033.85
8	GIBBS, Bob	54051	40:20	44:39	00:00	41:45	00:00	00:00	13:56	00:00	00:00	44:39	41:45	1:26:24	886.15	100.00	986.15
9	CHILTON, Stan	L-30	43:16	20:50	38:55	38:51	24:26	33:10	15:35	36:04	09:49	43:16	38:55	1:22:11	842.91	100.00	942.91
10	WILLIAMS, Warren	5550	20:32	31:13	11:16	37:17	10:25	35:29	00:00	00:00	00:00	37:17	35:29	1:12:46	746.32	89.51	835.83
11	LEONARD, Jr., Nick	497460	26:38	27:42	06:21	28:19	27:50	25:46	27:55	30:20	31:52	31:52	30:20	1:02:12	637.95	78.50	716.45
12	LEONARD, Sr., Nick	497461	07:22	00:00	00:00	00:00	00:00	00:00	00:00	00:00	00:00	07:22	00:00	0:07:22	75.56	82.57	158.13
13	MZIK, Larry	3687										DNF	DNF				

FID Team Selections
Tustin, California – August 1997

This was perhaps the last major flying event to be held at the Tustin Marine base. The base is in the process of being closed and hanger 2 has already been leased to a sound studio. They are still flying in hanger 1 but no one knows for how long. These are truly magnificent buildings and it is an awesome site to look from one end of the building to the other. Its hard to imagine that there were airships that would take up the entire space inside one of these buildings.

Participation in FID is slowly on the decline and only 12 took part in this team selection. Something needs to be done, and soon to increase participation. From the talk that went on during the team selection, its evident that it will be a hard up hill battle to break away from microfilm.

When we arrived at the site on Friday for a day of practice, everyone received 1 pound of 7/97 Tan II. Several of the fliers were reluctant about using it, mostly because of reports that the rubber had been exploding in flight. The weather was hot and the building temperature rose above 85 degrees Fahrenheit each day. There were no full motor flights on Friday and Jim Richmond had a great ½ motor flight of 26:00.

The first round started at 12:00 noon on Saturday, and there were 3 rounds flown each day. No one wanted to be the first one up, because of the uncertainty of the drift above the cat walk, which is at the 135 foot level. It depended on where the models were launched, but the drift was toward the cat walk if your model was at or above the walk. At the 110 foot level, the models drifted toward the ends of the building. Warren Williams put up the first flight and that got the ball rolling. As the day progressed, several of the models were lost to steering and as predicted, several more to the 7/97 rubber coming apart during the flight. At the end of the first three rounds, Richmond was in the lead, Underwood 2nd, and Coslick 3rd.

The second day was almost a carbon copy of day one. By checking the results, it looked as if no one wanted to improve their standing except John Kagan. John was using a smaller prop than the norm and a 21 inch loop of the new 7/97 rubber. John was having his problems with the new rubber, and reported that at one time he wound and broke 7 motors in a row before one held. The standing for day two, was Kagan 1st Coslick 2nd, Richmond 3rd.

It was evident that the last day of competition was going to be a shoot out. Bob Randolph had trashed all of his FID wings at the end of day two and had to beg back a wing that he had given Bob Gibbs. I don't know why he gave the wing away in the first place, because the retrieved wing secured Randolph a place on the 1998 team. Coslick folded a wing in round 7, but put up his best flight in round 9 with his model climbing just slightly above the cat-walk. Jim Richmond switched to the 7/97 rubber and put up his best two flights in rounds 8 and 9. John Kagan made a run at the leaders in round 7, but his flight of 47:14 was just short of placing him on the team. It was a great contest and the team members are anxiously waiting for word as to when the world championships will be held.

SURVEY FOR FUTURE FID RULES CHANGE

Richard Doig contacted most of the people on the current Team Selection Voting list and asked 5 questions.

1. How do you feel about reducing the span to 55cm, apart from any other rules change.

2. How do you feel about changing to plastic and abandoning film.

3. How much microfilm do you have, and how long do you expect it to last if its all good.

4. How do you feel about a rules formula that includes a maximum total area, wing plus stab.

5. How do you feel about a rules formula that includes a maximum rubber weight.

F1D Rules Change Survey					
Flyer	55CM	Plastic	Film Supply	Area	Rubber
Brown	no	no	3 years	no	no
Richmond	no	no	lifetime	no	no
Leonard	undecided	no	2 years	no	no
Leonard Jr.	undecided	no	2 years	undecided	no
Obarski	yes	maybe	3 Oz.	yes	no
Clem	yes	yes	12 Oz.	no opinion	no
Vallee	no	no	3 years	maybe	no
Coslick	yes	yes	36 Oz.	yes	no
Underwood	no	no	16 Oz.	no	no
Berieff	yes	yes	none	no	no
Harlan	yes	no	Plenty	no	no
Randolph	undecided	no	lots	no	no
Doig	no	no	15 years	no	no
Williams	yes	yes	32 Oz.	no	no
Shepard Jr.	yes	undecided	1 year	no	no
Grant	yes	yes	3 years	no	no
Tagliafico	yes	yes	1 year	yes	no
Soua	yes	no	4 years	no	no
Hulbert	yes	yes	some	no	no
Chilton	yes	yes	10 years	no	no
Banks	no	no	3 years	no	no
	57% yes	43% yes	N/A	24% yes	0% yes

8/93 Tan II Verses 7/97 & 10/97
By Larry Coslick

We just received the latest batch of Tan II which is labeled 10/97. Since 7/97 just came out, we needed to see if 7/97 & 10/97 is any better than 8/93. My latest way of comparing new rubber is to fly one batch against the other on ¼ motors. Through my limited testing it looks as though 7/97 and 10/97 are both better in cool weather than 8/93.

On this test I used a .9 gram EZB and stripped all rubber to weight. Each loop was made 3.5" long and weighed approximately .26 gram. They were within 1% of each other in weight. Each motor was pre wound twice to .15 in. oz. of torque and backed off with no rests between winds. The knot on each loop was marked with a different color marking pen to identify the batch. All of the test flights were done within a two hour period with the temperature at 72 degrees and 45% humidity and air less than perfect. On each flight the motors were wound to .3 in. oz. and backed off to .15 in. oz. Through out the entire test, the turns that were packed into the rubber was almost identical. This was a surprise, because I had not been able to get as many turns with the new rubber on previous days.

On the first flight, 8/93 took the model to around 33feet and landed at 4:48. 7/97 climbed to the same height but landed at 5:20. 10/97 only climbed to 27 feet and touched down at 5:11. On wind two, 8/93 climbed to 28 feet and did 4:53, while 7/97 climbed the same as 8/93 and did 5:18. 10/97 climbed the same as on flight one and did 5:05. On the last flight all of the modes climbed about the same as on the second flight and 8/93 posted 4:56, 7/97 —5:28 and 10/97—5:14. One important fact that I have noticed in the past, is that when tying up motors using two over hand knots, there is chafing near the knot. This happens even after applying saliva to the knot. Here is a way to eliminate the chafing. Lubricate the rubber where the knot is to be tied with rubber lube. Not every knot will work, but John Lindernam showed me one that will. Tie one overhand knot at the length you want the loop to be. Snug the knot up, but not to tight. ¼ inch in front of that knot toward the loop end of the rubber tie another overhand knot but reverse the direction in which you tie the knot. Pull the second knot back into the first. Most of the time I forget about reversing the direction of the knots, and it doesn't seem to make any difference. The second knot will tighten as it is pulled against the first knot.

On close examination of all the rubber used, there were no chafe marks or any sign of fatigue.

The only thing that I don't like about 10/97 is that it sags about half through the climb while 7/97 pushes on.

On further winding test, apart from the ones that were done of ¼ motors, several things were noted. 10/97 can be pushed hard, with very little damage to the rubber. 10/97 grapevines when winding if you come in too fast, while the knots stack neater on 7/97. 10/97 took 10% more turns when wound past .35in. oz. of torque, mostly because 7/97 broke at .5in. oz.. 10/97 went past .6 in. oz. before breaking. In conclusion, it looks as though the record book is about to be rewritten, again.

CANADIAN INDOOR NATIONAL CHAMPIONSHIPS, JULY 12 & 13, 1997

For the third year running these were held in the Air Canada Hanger at the Toronto International Airport, which is a category 3 ceiling (75' to the beams). This year we had competitors from both the USA and Canada including places as far away as St. Louis, Missouri, Cincinnati and Cleveland, Ohio; Deep River, Windsor and Ottawa, Ontario.

There were a total of 32 competitors, including 2 juniors and 8 from the USA, flying in 17 events over 26 hours. This resulted in 469 flights launched giving a total model flying time of 3,825.8 minutes. The longest flight was 40:06 by Larry Coslick of St. Louis, MO, in F1D and 10 new Canadian records were set, including 4 by juniors.

The air conditions were excellent with no noticeable drift and several people have commented that these were the best Canadian Indoor Nationals yet.They were successful because of the unstinting efforts of Gordon and Doreen Smith as Contest Director and Recorder, Sinon Ip as Registration Coordinator, and Dick Fahey and Phil Alvirez as Scale Judges.

The complete results are listed on the attached sheets.

CREDIT•SAM 86 SPEAKS

CANADIAN INDOOR NATIONALS, JULY 12 & 13, 1997 - FINAL RESULTS

Easy-B

Larry Coslick	24:09						24:09
Mike Thomas	10:57	22:33	23:03				23:03
Vlad Linardic	19:01	22:46	8:11				22:46
Walt Van Gorder	22:34						22:34
Dan O'Grady	18:01	20:32	11:37	19:54			20:32
Gene Joshu	20:30	7:00	18:08	3:00	12:17		20:03
Fred Tellier	17:45	18:44	18:15	19:13			19:13
Bill Henderson	18:34						18:34
Ken Mark	18:16	16:02					18:16
Richard Miller	17:55	16:36					17:55
Colin Raymond-Jones	5:31	10:27	17:48	11:32	16:05		17:48
John Marett	14:12	17:00					17:00
Peter Olshefsky	6:45	8:32	0:04	10:00	16:09		16:09
Vern Hacker	8:30	10:20	13:31				13:31
Jim Zufelt	2:45	10:36	8:54	11:15	8:44		11:15
Rob Tellier (Jr.)	10:04	9:44					10:04

Intermediate Stick

Jack McGillivray	9:42	15:13	29:08				29:08 (new record)
Mike Thomas	21:31	27:16	27:47	6:10	28:20		28:20
Larry Coslick	16:43	24:33	8:28	23:27	27:47		27:47
Larry Loucka	26:01	27:15	26:00				27:15
Vlad Linardic	22:12						22:12
Fred Tellier	19:51	11:58	21:57				21:57
Peter Olshefsky	18:48	15:05					18:48
John Marett	11:46	16:45					16:45

F1D

Larry Coslick	39:59	40:06					80:05
Fred Tellier	30:27	24:22	38:19 (new record)				68:46
Larry Loucka	30:23	27:08	29:11				59:34
Vlad Linardic	20:49	17:36					38:25

MAAC Cub

Jacob Murray	38.31	45.78	50.47	31.28	56.78	53.81	54.37	17.37	45.66

Bostonian

					Charisma	Score
Mike Thomas	4:23	5:02	4:03	5:25(new record)	1.175	736.725
Richard Miller	4:50	4:43	4:50		1.18	684.4
John Marett	3:31	4:34	4:25		1.17	630.63
Bill Henderson	3:36	3:25	4:34		1.175	575.75
Stu Weckerly	3:04	2:38	3:03	3:20	1.175	451.2
Greg Gallo	2:51	3:11			1.17	423.54
Jim Lee (Box Car)	2:05	1:58			1.2	291.6
Jim Lee(Miss Brantford)	1:54	1:39	1:42		1.19	257.04
Bill Penny	1:20	1:15	1:16	1:10	1.08	168.48

Pennyplane

Larry Coslick	15:37	14:30	6:47	15:55	16:15	16:15
Dan O'Grady	15:13	15:12	13:42	14:46	16:14	16:14(new record)
Vlad Linardic	11:37	6:54	16:10			16:10
Mike Thomas	13:23	14:32	15:47	14:54		15:47
Peter Olshefsky	14:31	12:50	15:00			15:00
Fred Tellier	13:24	14:43				14:43
Bill Henderson	14:24	12:46				14:24
Phil Alvirez	13:44	8:10	13:44	10:52	13:20	13:44
John Marett	9:58	12:36				12:36
Jack McGillivray	12:07	11:26				12:07
Gene Joshu	11:49	8:55	12:03	5:20		12:03
Rob Tellier (junior)	8:55	10:13	10:25	9:08	8:32	10:25
Jacob Murray (junior)	8:53	5:54	8:21	9:30	10:23	10:23
Mike Kent	9:44					9:44
Stu Weckerly	8:31	8:04	9:29			9:29
Colin Raymond-Jones	9:05	5:48	9:18	7:05	7:05	9:18
Jim Zufelt	6:01	7:45	8:23	8:22		8:23
Harley Ellis	5:58	7:48				7:48
Bill Penny	5:20	5:28	5:05	5:15	5:30	5:30

Manhattan Cabin

Walt Van Gorder	11:49					11:49
Mike Thomas	9:11	10:39	10:38			10:39
Larry Loucka	7:36	9:56	10:19	9:43	10:34	10:34
Larry Coslick	6:51	6:50	10:00	8:24	10:14	10:14
John Marett	4:22	7:24	9:08			9:08
Stu Weckerly	5:57	7:10				7:10

Grand Champion

Mike Thomas	582.29
Larry Coslick	577.95
Fred Tellier	497.67
Bill Henderson	479.00
Jack McGillivray	473.91
John Marett	467.75
Vlad Linardic	417.93
Stu Weckerly	393.31
Greg Gallo	293.87
Colin Raymond-Jones	223.73

Novice Champion

Harley Ellis	223.70
Bill Penny	217.38
Mike Kent	195.41
Jimmy Zufelt	172.41

Novice Scale Champion

Chris Brownhill	226.26
Bill Penny	142.20
Paul Truupere	95.51

Junior Champion

Jacob Murray	372.57
Rob Tellier	359.50

Other Records

Junior

Jacob Murray	Standard Catapult Glider	1:14.5 (2 flight total)
Jacob Murray	Unlimited Catapult Glider	1:15.0 (2 flight total)

Open

John Marett	Unlimited Catapult Glider	1:49.0(2 flight total)

Easybuilt Scale

Mike Thomas	Cub	1:36	2:16	2:40	2:40		2:40
Richard Miller	Cub	2:26	2:29				2:29
John Marett	Leopard Moth	2:02	1:16	1:37	2:11		2:11
Chris Brownhill	Cub	0:59	1:19	1:42	1:51	2:00	2:00
Greg Gallo		1:03	1:12				1:12
Paul Truupere		0:28					0:28

FAC Scale

					Scale points	Bonus points	Total points
Jack McGillivray	SE-5A Replica	1:26			60	15	148
Stu Weckerly	Stout 2AT	2:22			48	0	130.5
Chris Brownhill	Lacey	1:35	1:27	1:36	32	0	108.5
Paul Truupere	Gloster Gladiator	0:30	0:30	0:34	25	15	74
Bill Penny	Farman Mosquito	0:34	0:32	0:36	15	5	56

FAC Peanut

					Scale points	Bonus points	Total points
Jack McGillivray	Voison Hydroplane	1:30	0:52		51	30	156
Bill Henderson	Bleriot VII	1:55	1:57	1:05	50	10	141.75
Stu Weckerly	Stout 2AT	2:19			50	0	132.5
Jim Lee	Lacey M10	1:17	1:27		50	0	123.5
Chris Brownhill	Lacey M10	2:20			40	0	122.5
Greg Gallo	Nesmith Cougar	1:14	0:52	1:20	48	0	118
Stu Weckerly	DeHavilland DH-6	0:50	0:46	0:56	47	15	118
Jack McGillivray	Fleet Canuck	0:56	0:46		53	0	109
Bill Penny	Wright WP-1	0:55	0:57	0:59	17	3	79
Paul Truupere	Gypsy Moth	0:31	0:31	0:31	25	15	71

Junior Limited Pennyplane

Jacob Murray	10:20	7:39	8:11	11:04	9:41	11:04 (new record)
Rob Tellier	9:59	10:36	8:32	11:01	9:05	11:01

Limited Pennyplane

Vlad Linardic	11:57	11:37	12:21	12:47		12:47 (new record)
John Marett	12:03	11:51	12:43			12:43
Jack McGillivray	12:16	12:17	12:29	12:42		12:42
Stu Weckerly	12:34	10:40				12:34
Mike Thomas	11:52	12:30				12:30
Jack Archibald	10:21	11:12	10:29	11:54	12:18	12:18
Walter Van Gorder	11:53	10:45				10:45
Phil Alvirez	9:56	11:27				11:27
Dan O'Grady	10:13	11:01	11:13			11:13
Colin Raymond-Jones	8:23	10:37	10:24	10:10	8:31	10:37
Mike Kent	8:27	9:03	9:30	10:31		10:31
Greg Gallo	8:23	9:12	10:26	1:14	1:38	10:26
Fred Tellier	9:18	9:58				9:58
Bill Henderson	7:12	-----	9:56	9:49		9:56
Ken Mark	9:54					9:54
Harley Ellis	2:55	9:48				9:48
Jim Zufelt	7:57	9:26	7:43	9:36	9:30	9:36
Vern Hacker	8:09	6:58	9:05	9:22	9:18	9:22
Roy Martin	8:20	8:23	8:38	8:26	9:22	9:22
Peter Olshefsky	8:35	7:50				8:35
Bob Jennings	6:41	7:14	8:05			8:05
Bill Penny	5:17	5:07	4:55	4:58	4:55	4:55

CANADIAN INDOOR NATIONALS, JULY 12 & 13, 1997 - FINAL RESULTS

FAC NoCal - under 5 grams

Jack McGillivray	Cessna Cardinal	8:56	9:45	9:24	28:05
Stu Weckerly	Stallion	6:28	4:19	4:46	15:33
John Marett	Centurion	4:14	4:08	4:46	13:08
Mike Thomas	Stormavik	5:57	2:11	——	8:08
Chris Brownhill	Stormavik	2:49	——	——	2:49

FAC NoCal - over 5 grams

Mike Thomas	Hosler Fury	6:14	6:55	5:25	18:33
Larry Loucka	Hosler Fury	6:02	6:08	5:50	18:00
Chris Brownhill	Lacey M10	4:42	4:40	4:21	13:43
John Marett	Fike E	4:29	4:08	4:08	12:45
Bill Henderson	Hosler Fury	3:43	3:54	4:51	12:28
Bill Penny	Old Ironsides	3:17	3:14	3:18	9:49
Greg Gallo	Fairey Firefly	2:55	3:11	3:34	9:40
Stu Weckerly	Bonzo	2:46	2:31	2;47	8:04

Ministick

Walter Van Gorder	9:14	11:36	10:44			11:36
Larry Coslick	8:22	9:26	10:09	11:08	10:42	11:08
Fred Tellier	7:34	6:34	8:46	9:00	10:15	10:15
Phil Alvirez	9:11	9:24	10:14	9:10	5:47	10:14
Dan O'Grady	9:19	9:23	9:42			9:42
Richard Miller	7:12	9:13	9:19			9:19
Bill Henderson	3:05	9:01				9:01
Peter Olshefsky	7:03	8:29	6:40	9:00	4:12	9:00
John Marett	8:50	7:24				8:50
Gene Joshu	7:00	4:39	7:09	6:58	8:35	8:35
Colin Raymond-Jones	7:18	7:58				7:58
Ken Mark	7:23	7:42				7:42
Vern Hacker	7:37					7:37
Michael Kent	4:21	6:19	5:43	1:41	2:20	6:19
Rob Tellier(Jr.)	5:11	5:09	6:17	4:32		6:17(new junior record)
Jacob Murray(Jr.)	3:49	3:00	4:26			4:26
Greg Gallo	3:08					3:08

World War II No-Cal Combat

Mike Thomas	Stormovik
Richard Miller	F4U Corsair
Jack McGillivray	Barracuda

Easy-A

Harley Ellis	9:03	9:25	6:17	8:07	9:25
Sam Burke	8:46	9:25	7:07		9:25
Jacob Murray(Jr.)	7:57	7:47			7:57
Rob Tellier(Jr.)	11:17	8:47			11:17

Previous winner '96 and cannot be placed in standings, but has Ist. place points for the Junior Championship.

KIBBIE DOME ANNUAL AND INTERNATIONAL EZB CONSTEST
August 2 – 5

The first sight that greeted us when we entered the Kibbie Dome was the plastic covered speakers hanging from the middle of the dome. That meant no flying in the center, where there are no acoustical tiles hanging about three feet from the ceiling, but just the wood roof. However, the spirit of the Kibble Dome took over, and in the afternoon preceding the competition, we set up the tables, chairs and the plastic floor covering under them to protect the floor. Everyone pitched in, and helped to get everything ready for the flying, which would start in the morning. The warm fellowship that was felt then continued during the rest of the days while we were there.

The schedule called for HLG, and catapult glider in the mornings, from 8 to 9:30. In HLG, John Buskell from Canada, and Bruce Kimball both showed they had good arms. Bruce had a new model with the wing made with foam and glass; the lights showed through when the model was gliding. Bruce couldn't quite get his adjustments to produce a consistent recovery at the top. John Buskell was the winner with two good flights totaling 2:07. Catapult glider had 8 entries, with lots of design variations, most with polydihedral wings. With the use of carbon fiber on the fuselages, it was startling to watch a glider come straight down, bounce 3 or 4 feet in the air, and be ready to fly again after smoothing the clay balance on the nose. Ed Berray had a new DeShields design that flew very well with flights over a minute. He was leading until the last day when Wally Miller broke his "good" DeShields design, then brought out an old original design that few extremely well. With two official flights totaling 2:17.5, he garnered first place. There were variations in launching techniques, from straight up climbs to rolling, spiraling climbs. Rubber used in launching varied in length, size and number of strands. Most used a dowel to hold the rubber launchers, but some just held the rubber between thumb and forefinger, adjusting and length to get the best and highest climb. I didn't observe anyone hitting the ceiling as Bob DeShields did last year; most only reached about 75 per cent of the ceiling height on launch. As mentioned above, the format called for HLG and catapult from 8 to 9:30 each morning. The format of the meet is good in that it allows almost unlimited flying, and time for repairing, adjusting, and checking of rubber sizes, lengths, number of turns, and torque. On the first day of the meet, Gene Joshu severely damaged his intermediate stick model, but was able to get it repaired, and posted a good flight of 27:42. He said he would normally be out of the competition, but with the format set up by Andrew Tagliafico, he had time to repair, test, and have a competitive model back in the air. The size of the flying area gives plenty of room for flying and testing without disturbing the other models. During the entire four days of flying, I did not observe even one midair. There was a possible potential for a midair when a scale electric powered model flew the length of the dome, making large circles and going through the area where three FID models and a couple of EZB's were in flight. Fortunately, but not for the electric model, his plane missed every model, and eventually hit some steel beams at the end of the building, damaging his model badly. A few models strayed into the area where the duration models were parked, with several being damaged and needing repair. However, despite all of the continuous flying, there were very few problems, again due to the large size of the building. The greatest hazard were the wires supporting the plastic covered speakers, and the two rolled up curtains and supporting wires for them. These were lowered each day so models could be retrieved. This year there were only a few models that went above the acoustic tile panels near the ceiling, and remained there. A good many models bounced the bottom and edges of those 12' X 12' panels, but managed to avoid going over the top.

The most hotly contested event was Easy B. The models were all very competitive, and constructed with skill. I believe that was partly due to the excellent article in the INAV a few issues ago, where Larry Coslick took you through the building of an Easy B, step by step. You have to believe Larry knows what he's talking about because early early in the competition he posted a flight of 29:45, which was the winning time. There were a number of Easy B flyers who achieved their personal best times, and it got better during the International Easy B contest on the 4th day of the meet. Mike Palrang quietly put up a 28:17 flight that showed he is one of the top flyers in this event. One of the results of Larry's article was that most models weighed in at between .5 and .7 grams. Props were more carefully built, and used thinner prop blades, anywhere from .005 to .007. and thinner prop spars. Most of the flyers I talked to used 8-93 rubber, but several were using 4-95.

Limited Penny plane was also a hotly contested event, with a good number of entries. Jim Clem, "Mr. Pennyplane", used his new Cobra design with the motor stick inclined down in the rear at 9 degree. His first flight was 14:54, a touch free flight that leveled out to cruise just below the tiles, and was good enough to win the event. The other flyers tried hard to catch Jim, but were beset with either hanging up on the speaker wires, the curtains, or bunched motors. Several flyers exceeded their previous best times, and vowed that they would be ready next year to challenge for high time. Regular Pennyplane entrees were down a bit, but again, Jim Clem, on his first flight, posted the winning time of 16:46. The next best time was 15:30, with a Thrush plus 10, single wing. This modeler was also plagued by the wires holding the curtain. Intermediate Stick had some good models, topped by Mike Palrang with a 28:40 flight. Gene Joshu, with his repaired model, did a creditable 27:42.

We expected Mini-stick times to exceed 12 minutes, and was disappointed to see a winning time of 11:37. One second behind was our national record holder, Andrew Tagliafico. The winner was Mike Palrang with a 11:37 flight. Wally Miller, the originator of the Easy B event was third with 11:22. It seemed that when the competitors were flying Mini-stick, an inversion layer kept them from climbing too high, and the models were coming down with lots of turns left.

The P-24, event, flown under our West Coast rules, seemed to be a shoo-in for Lew Gitlow, who early posted a very good flight of 7:31. However, a determined flyer kept persistently trying a good number of rubber combinations, and eventually put up a fight of 7:48, getting his model up near the tiles, and using a long cruise, came down dad stick about 5 feet from the floor.

Bostonian had 6 entries, with a newcomer, Orv Olm, winning with a time of 2:56. Close behind, flying Bob Stalicks Bostonian, was John Lenderman with 2:52.

Federation ROG had 3 entries, with only 2 flying. Andrew Tagliafico had a good flight of 9:01 to win the event. The A-6 event is a good one for beginners, and one that should grow in popularity. The winning flight was 5:07.71, which is believed to be the first one to exceed the 5 minute mark. The design used at Moscow is David Aronsteims Seattle A-6, built according to the plans with no modifications.

Pro-20, an event originated by Wally Miller and Andrew Tagliafico, had good flying, but only 3 entrants. Andrew won the event with a good time of 27:13. There is some talk about modifying the event to attract more modelers to compete.

F1D had 4 entries, and all put in good flights, except Larry Coslick with an outstanding time of 46:27, with a back up flight of 42:33. The good news, just received recently, was that Larry, competing in the F1D finals, is the number 3 man on the team, who will compete in Nagoya, Japan, for the World Champs. Congratulations Larry!

Ornithopter, a difficult event, attracted 3 flyers, with Gil Coughlin the winner with a 7:09. Anita Taylor, an avid flapper builder, had some problems, but garnered a second place with a time of 5:25. Anita worked the whole time to get her models completed and repaired in order to get in official flights.

We are hoping ROG stick will become a more popular event. It really is a fun model. Fred Hollingsworth, from Canada, after competing at the Willamette Modelers 2 day contest in late April, went home and built 3 more new ROG stick models, testing them for the first time at Moscow. He posted a good flight of 11:05.97 after only 3 test flights. A few of his designs are in the Zaic yearbooks. He is an enthusiastic builder and flyer, and plans to build lots more models for next year. The winning flight in ROG stick was 14:51, flown by John Lenderman with his Baby Thrush.

The International Easy B had 14 singed up, and produced some great designs and many consistent flights. Mr. Easy B, Larry Coslick, won the event with flights of 29:52 and 28:09. His model just seems to float in the air. Mike Palrang did very well with two good times of 27:43 and 26:12. Third place, from the Seattle area, was Tim Taylor. He has made great strides in the past few years. His times of 26:05 and 25:56 were his personal bests. The overall quality of the models in this event was excellent, and the format of flying in rounds gave each flyer the time to concentrate to do their best.

The atmosphere during the entire meet was of good fellowship, helping one another, and the free exchange of information and ideas between the modelers. I believe they all came away from this competition feeling food, and glad they attended. The dates for next year at the Kibbie Dome are already scheduled for August 1-4. Why not make your plans to attend and see why we come back each year? We'll look forward to seeing you, and enjoying our time together.

Don't forget to thank Andrew Tagliafico for organizing this prestigious event.

Reported by John Lenderman

Wally Miller International EZB Competition

Moscow Idaho

Name	Best	2nd Best	Total	Standing
Larry Coslick	29:52	28:09	58:01	1
Mike Palrang	27:43	26:12	53:55	2
Tim Taylor	26:05	25:56	52:01	3
Bruce Kimball *	25:11	25:08	50:19	4
John Linderman	25:07	24:33	49:40	5
Andrew Tagliafico	24:57	23:36	48:33	6
Wally Miller	24:18	23:53	48:11	7
Gene Joshu	24:33	22:33	47:06	8
Darry L Stevens	23:37	22:37	46:14	9
Lew Gitlow	22:44	22:24	45:08	10
Ed Berray	23:12	21:26	44:38	11
Jim Clem	22:44	21:31	44:15	12
Ken Hark	22:10	21:45	43:55	13
Chuck Dorsett	22:59	20:51	43:50	14

* Bruce Kimball flew the Hobbyshopper EZB as featured in INAV Issue #90 Feb. 97

National Free Flight Society Request for Nominations
1998 Symposium Ten Models of the Year

Categories for nomination:

1) Models of the modern era which exhibit unique design and outstanding performance as proved in competition.
2) Unique gadgets, materials or model components which have contributed to the advancement of free flight.

Nominations for models should include:

1) Cover letter
2) Description of model design and competition record.
3) Brief resume' of modeler/designer.
4) One-page three-view plan with dimensions.
5) Photographs of modeler with model.

Deadline for completed nominations:

Postmark February 16, 1998

Send completed nomination to:

Bob Perkins, Chair, NFFS Ten MOY Committee
2285 Pinebrook Road
Columbus, Ohio 43220-4327
U.S.A.

Tele: 614 451-3558

Awards to be Presented at 1998 Annual NFFS Banquet
Muncie, Indiana, July, 1998 (NATS)

1997 Kibbie Dome Annual Moscow Idaho

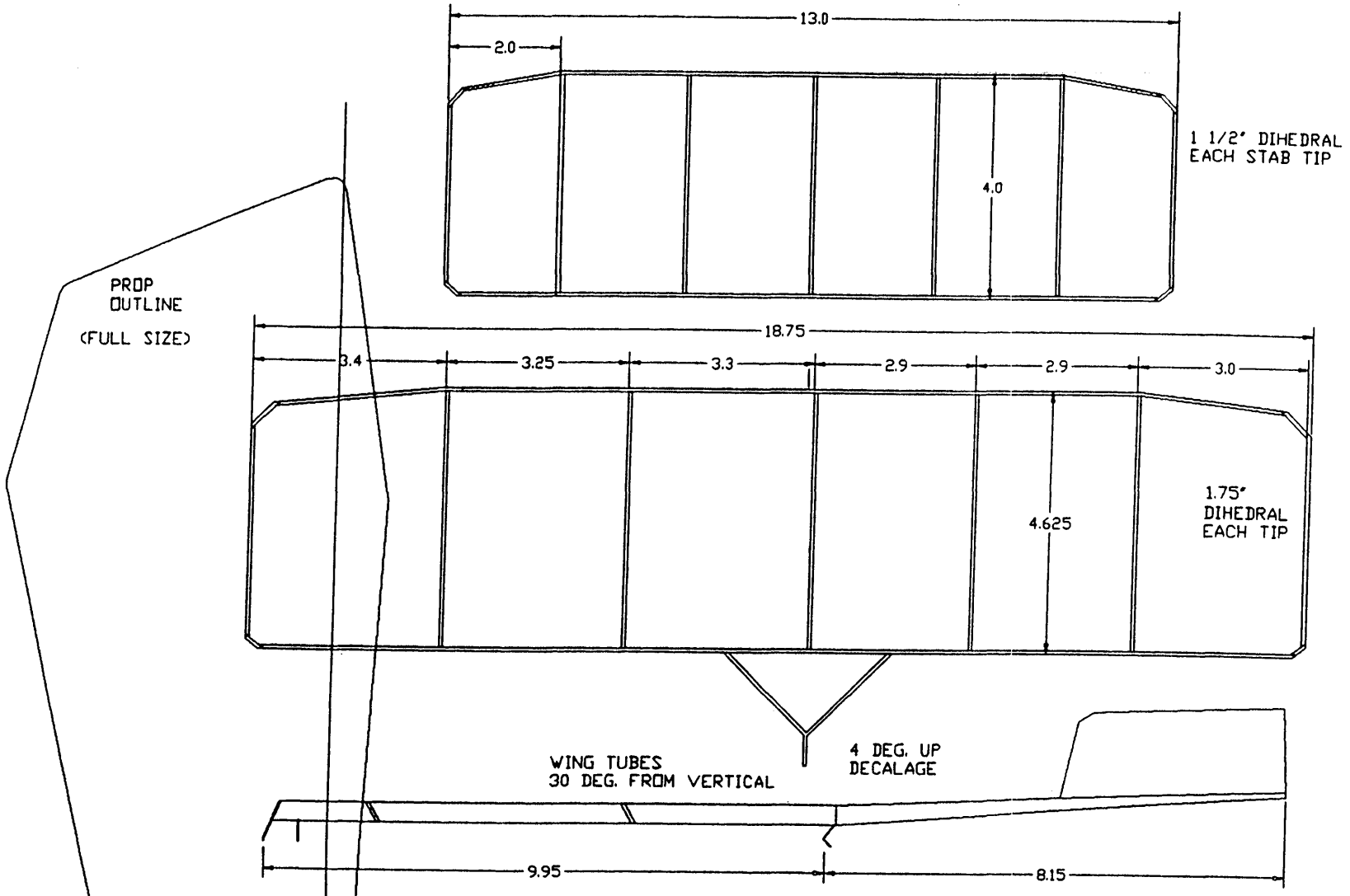
Place	Contestant	Time
EZB		
1st	Larry Coslick	29:45
2nd	Mike Palrang	28:17
3rd	Bruce Kimball	26:52
Intermediate Stick		
1st	Mike Palrang	28:40
2nd	Gene Joshu	27:42
3rd	Charles Dorsett	26:34
F.I.D.		
1st	Larry Coslick	46:27
2nd	Ed Liem	38:25
3rd	Darryl Stevens	35:06
Limited Penny Plane		
1st	Jim Clem	14:54
2nd	John Lenderman	14:30
3rd	Mike Palrang	14:08
Penny Plane		
1st	Jim Clem	16:46
2nd	John Lenderman	15:30
3rd	Bruce Kimball	12:12
Mini – Stick		
1st	Mike Palrang	11:37
2nd	A. Tagliafico	11:36
3rd	Wally Miller	11:22
Bostonian		
1st	Orv Olm	2:56
2nd	John Lenderman	2:43
3rd	David Higgins	2:04
Ornithopter		
1st	Gil Coughlin	7:09
2nd	Anita Taylor	5:25
3rd	Loran Wright	1:08

Place	Contestant	Time
Hand Launched Glider		
1st	John Buskell	2M 07
2nd	Bruce Kimball	1M 47
3rd	Ed Berray	1 M 06.7
Standard Catlapult Glider (Best 2 of 9)		
1st	Wally Miller	2M 17.5
2nd	Ed Berray	2M 13.25
3rd	Mike Palrang	1M 59.8
Pro - 20		
1st	A. Tagliafico	27:13
2nd	Larry Coslick	25:51
3rd	Wally Miller	19:27
P-24		
1st	John Lenderman	7:48
2nd	Lew Gitlow	7:31
3rd	Albert Lieo	6:03
A - G		
1st	John Lenderman	5:07.7
2nd	David Higgins	3:45
3rd	Ed Berray	2:11.6
Federation R.O.G.		
1st	A. Tagliafico	9:01
2nd	Gil Coughlin	7:07
R.O.G. Stick		
1st	John Lenderman	14:51
2nd	Fred T. Hollingsworth	11:05.9

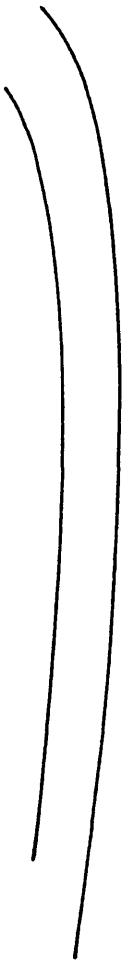
Winning Designs

We are featuring 4 of the winning designs from the 1997 USIC. More will follow in future issues.

The EZB is not a USIC winner, but was designed for the new 1998 International EZB "Novice Class" event - Moscow Idaho. The EZB Proto-type was used for the rubber comparison test in this issue.



wing and stab airfoils



wing and stab airfoils

LIMITED PENNY PLANE
designed by
LARRY CAILLAIU

WINNER 97 NATS LIMITED PENNY

MODEL NAME: LPP SQUARE PENNY BUILDER: Larry Cailliau

MOTOR STICK SOLID

Density # 5.5 Grain A Length 10 Front, Width 3/32"

Height 1/4" Center, W. 3/16" H. 5/16" Rear, W. 3/32" H. 1/4"

Cut Weight _____ Finished Weight _____ Special Instructions _____

Thrust Bearing, Wire size .017" Other _____ Web. Density 5#

Thickness .020" **Rear Hook** .017" Web. Density 5#

Thickness _____ **Paper Tubes**. Material Used Jap Tissue

Adhesive Used Duco Special Instructions _____

M/S complete with tubes, post, wire. Weight _____

Boom Solid. Density _____ Grain _____ Length 8"

Front Width 3/32" Front Height 1/4" Center W. _____

Center H. _____ Rear W. 1/8" Rear H. 1/8" Cut Weight

_____ Finished Weight. _____ Special Instructions _____

WING

Leading Edge Spar. Density 5.5# Grain B Length 11 1/4" Width 3/32"

Height 1/16" Weight _____. **Trailing Edge Spar.** Density 5.5# Grain B

L. 11 1/4" H. 1/16" W. 3/32" Weight _____ **Tips.** Density 5.5#

Grain B Tip at L/E. Width 3/32" Height 1/16" Tip at T/E. Width 3/32"

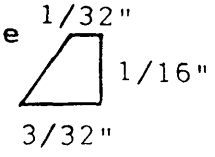
Height 1/16". Weight for 2 Tips. _____ **Ribs Standard.** Density 5#

Grain C W. 1/32" H. 1/16" Weight Ea. _____

Wing Posts Density 6# Grain A L. 2 1/16" W. 1/16" H. 1/16"

Posts Round, Posts Rectangle. Weight for 2 finished posts. _____ Wing Weight Complete

_____ Special Instructions All the spars are cut triangular from 1/16" sheet on Harlan Stripper with blade at 45 degree



MODEL NAME LPP SQUARE PENNY BUILDER Larry Cailliau

Prop, Wood Blades - - - Fill in prop spar information

Blades. Density 5# Grain C Blades Area, Ea. _____

Blade Thickness 1/32" Weight for 2 Blades _____

Give prop pitch at 45 degrees and one inch from tip. Pitch at 45 degree 22P Pitch 1 inch

From tip. 22P. If V / P, Low pitch _____ High pitch _____

If V / D, Diameter when extended _____ Diameter when folded. _____

Speical Instructions on prop construction _____

_____

STAB

Outline. Density 4# Grain B Leading Edge Center, W. .050"

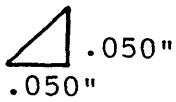
H. .050" Tip. W. _____ H. _____. Trailing Edge Center, W. .050"

H. .050". Ribs. Density 4# Grain C W. 1/32" H. .050"

Weight Ea. Rib. _____ Weight of Outline Dry. _____

Weight Covered _____ Special Instructions All spars cut

triangular from .050" wood



RUBBER

Loop Length 18" Width .065" Rubber Vintage, Month and Year

8 1993. Weight of Loop. 1.84 G. Turns 2700

Back off Turns. 120 Launch Torque in inch ounces. .35 Turns Left 80

Do you use O rings. Yes. Yes No. _____

TRIM

Wash In, Wing Left panel 0 Wash Out Left panel. 0

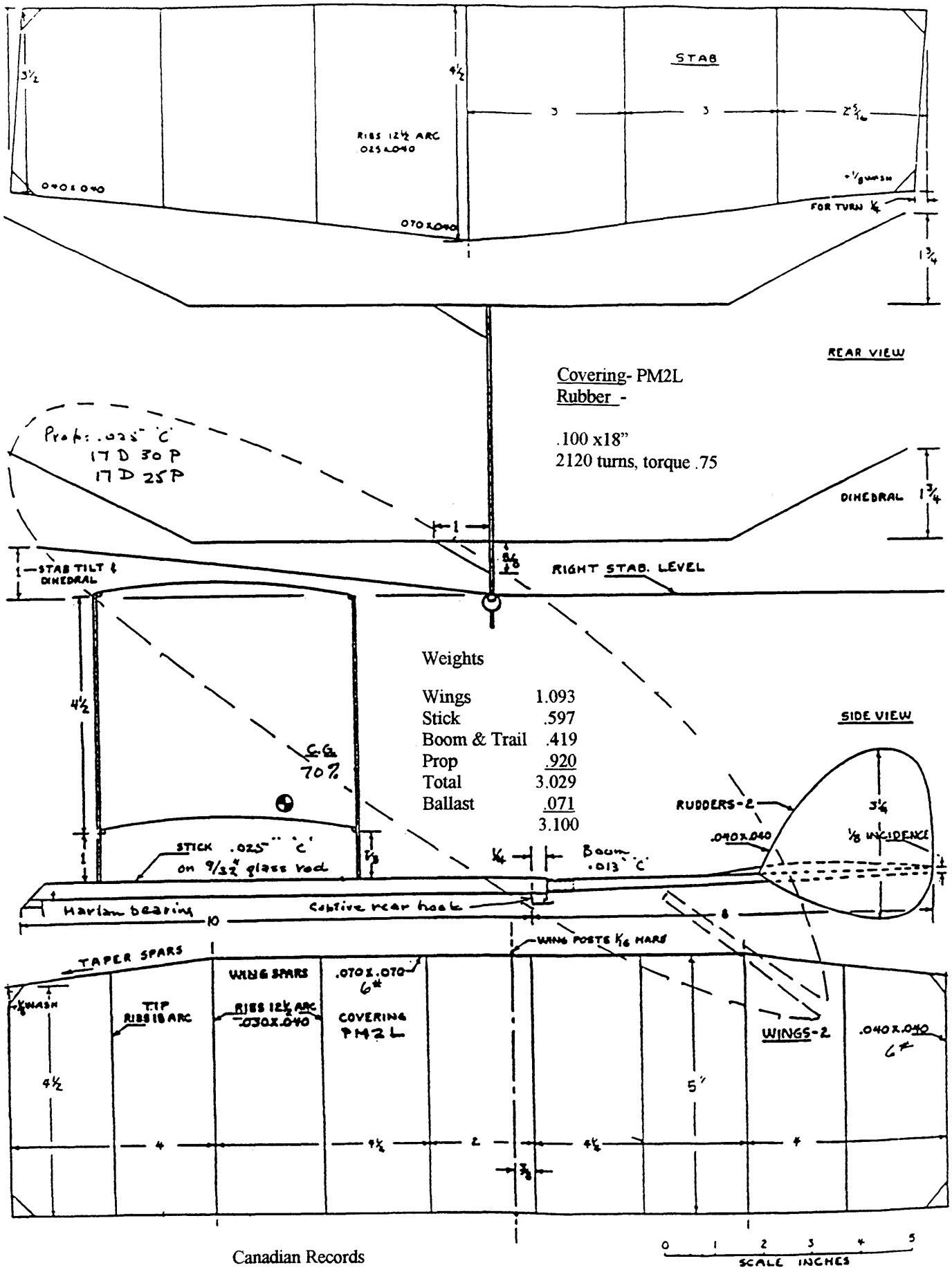
Wash Out, Right panel 0 Wash In, Right panel 0

Wash In Stab, Yes _____ No NO How Much _____

Down Thrust. _____ Left Thrust. 4 degree Special trim instructions.

Stab set 4 degree (up or negative incidence) No other trim was made except for wing incidence.

No stab tilt.



Canadian Records

1994 USIC – 3rd – 16:40
1995 USIC – 1st – 17:04

Penny Plane
19:15
1997 USIC
Dan O' Grady

MODEL NAME: PENNYPLANE BUILDER: Dan O'Grady

MOTOR STICK ROLLED

Density # 5.25 Grain C Length 10 1/4" Cut Width _____

Sheet Weight _____ Cut Weight. .392G Glued Weight _____

Did you use boron. Yes. No. Boron size _____ Boron Placement _____

Special Instructions Sheet thickness .025" Rear Hook is safety pin type by Roy Bourk. Shown in SAM 86 SPEAKS

Thrust Bearing, Wire size _____ Other Harlan Web. Density _____

Thickness .055" Rear Hook Captive Web. Density _____

Thickness Paper Tubes. Material used _____

Adhesive Used _____ Special Instructions Added Motor Stick Inst. Formed on 9/32" glass tube. Motor Stick with Boom .562G .676G with bearing and rear hook

M/S complete with tubes, post, wire. Weight _____

Boom

Boom Rolled . Density 5.25# Grain C Sheet Weight _____

Cut Weight .093G Width Front 13/16" Width Rear. 7/16"

Glued Weight .1G Boron. Yes. No. Boron Size _____ Boron Position _____ Finished Weight. .1G Special Instructions .013" sheet thickness

WING

Leading Edge Spar. Density 6# Grain A Length _____ Width .065"

Height .073" Weight _____. **Trailing Edge Spar.** Density same Grain A

L. _____ H. same W. same Weight _____ **Tips.** Density _____

Grain _____ Tip at L/E. Width _____ Height _____ Tip at T/E. Width _____

Height _____. Weight for 2 Tips. _____ **Ribs Standard.** Density unk

Grain _____ W. .030" H. .040" Weight Ea. _____

MODEL NAME PENNYPLANE BUILDER Dan O'Grady

WING

Wing Posts Density 9# Grain A L. 9" W. _____ H. _____

Boron . Yes. No. Boron Size. _____ Boron Position _____

Posts Round. Posts Rectangle. Weight for 2 finished posts. .112G Cabane. Density _____

Grain _____ Cabane Front. L. _____ W. _____ H. _____

Tapered to W. _____ H. _____. Cabane Rear. L. _____ W. _____

H. _____ Weight _____. Wing Bracing Wire. _____ Wing Dry. .385G

Wing Covered. .478G Wing Weight Complete. (2) .990G Special Instructions

STAB

Outline. Density _____ Grain A Leading Edge Center. W. .040"

H. .070" Tip. W. .040" H. .040". Trailing Edge Center. W. .040"

H. .070" Ribs. Density _____ Grain _____ W. .025" H. .040:

Weight Ea. Rib. _____ Weight of Outline Dry. .205G

Weight Covered .290G Special Instructions _____

Prop, Wood Blades

Speical Instructions on prop construction Prop Blades .025" Weight (2) .72G

PROP 1 --- 17 1/8"D X 30"P .866G Helical Non VP

PROP 2 --- 17 1/4"D X 25"P .920G " " "

Prop spar is 3/32" at hub and taperes at tip.

RUBBER

Loop Length 18" Width .100" Rubber Vintage. Month and Year

8 1993. Weight of Loop. _____. Turns 2120

Back off Turns. None Launch Torque in inch ounces. .75 Turns Left 0

Do you use O rings. Yes. Yes No. _____

TRIM

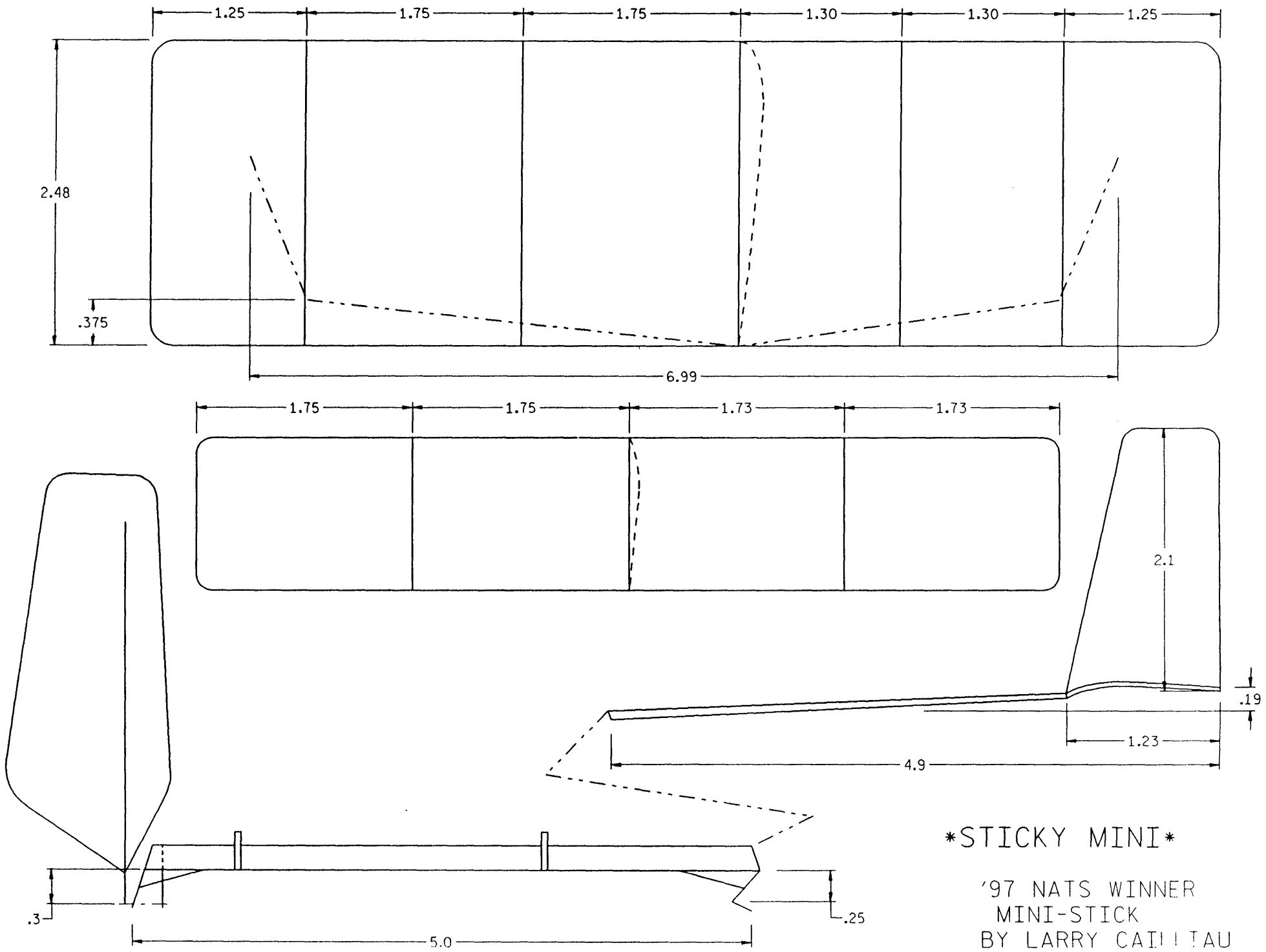
Wash In. Wing Left panel Both 1/8" Wash Out Left panel. _____

Wash Out. Right panel _____ Wash In. Right panel _____

Wash In Stab. Yes Yes No _____ How Much 1/16"

Down Thrust. _____ Left Thrust. _____ Special trim instructions.

I don't cement the boom to the joiner tube until I establish the turning circle on the initial test flight. Then cement it in.


1.25
1.75
1.75
1.30
1.30
1.25
2.48
.375
6.99
1.75
1.75
1.73
1.73
2.1
.19
1.23
4.9
.3
.25
5.0
STICKY MINI
'97 NATS WINNER
MINI-STICK
BY LARRY CAI!!TAU

MODEL NAME MINI-STICK BUILDER Larry Cailliau

MOTOR STICK SOLID

Density # 5 Grain A Length 5" Front, Width .075"

Height .185" Center, W. .075" H. .220" Rear, W. .075" H. .185"

Cut Weight _____ Finished Weight .156G Special Instructions _____

.165G weight includes the weight of Motor Stick and boom. No dimensions on boom.

Thrust Bearing, Wire size .012" Other _____ Web. Density 5#

Thickness .020" **Rear Hook** .020" Web. Density 5#

Thickness .020" **Paper Tubes.** Material Used Jap Tissue

Adhesive Used Duco 50/50 Special Instructions _____

WING

Leading Edge Spar. Density 5.5# Grain A Length 6.1" Width .030"

Height .035" Weight _____. **Trailing Edge Spar.** Density 5.5# Grain A

L. 6.1" H. .030" W. .035" Weight _____ **Tips.** Density _____

Grain _____ Tip at L/E. Width .030" Height .035" Tip at T/E. Width .030"

Height .035". Weight for 2 Tips. _____ **Ribs Standard.** Density 5#

Grain C W. .030" H. .035" Weight Ea. _____

Wing Posts Density 5.5# Grain A L. 1 1/4" W. .030" H. .040"

Wing Covered. _____ Wing Weight Complete. .131G Special Instructions

Tips taper from .030"X.035" to .025" Sq.

STAB

Outline. Density 4# Grain B Leading Edge Center, W. .025"

H. .030" Tip. W. .020" H. .020". Trailing Edge Center, W. .025"

H. .030". Ribs. Density 4# Grain C W. .025" H. .030"

FIN

Fin, Not Floating. Density 4# Grain B W. .025"

H. .025" Weight Dry. _____ Weight Covered. _____

MODEL NAME MINI-STICK BUILDER Larry Cailliau

Prop Spar. Density 4.5# Grain C Spar Length 6"

Dimensions at prop shaft, W. .065" H. .070" Dimensions at Tip.

W. .020" H. .020" Spar Weight. _____ Prop Shaft

Wire Size. .012"

Prop, Wood Blades

Blades. Density 4.5# Grain C Blades Area, Ea. _____

Blade Thickness .012" Weight for 2 Blades _____

Give prop pitch at 45 degrees and one inch from tip. Pitch at 45 degree 16P Pitch 1 inch

From tip. 16P. If V / P, Low pitch _____ High pitch _____

If V / D, Diameter when extended _____ Diameter when folded _____

Speical Instructions on prop construction Prop complete .136G

RUBBER

Loop Length 10" Width .022" Rubber Vintage, Month and Year

8 1993. Weight of Loop. .31G. Turns 2800

Back off Turns. 60 Launch Torque in inch ounces. .1 Turns Left 100

Do you use O rings. Yes. Yes No. _____

TRIM

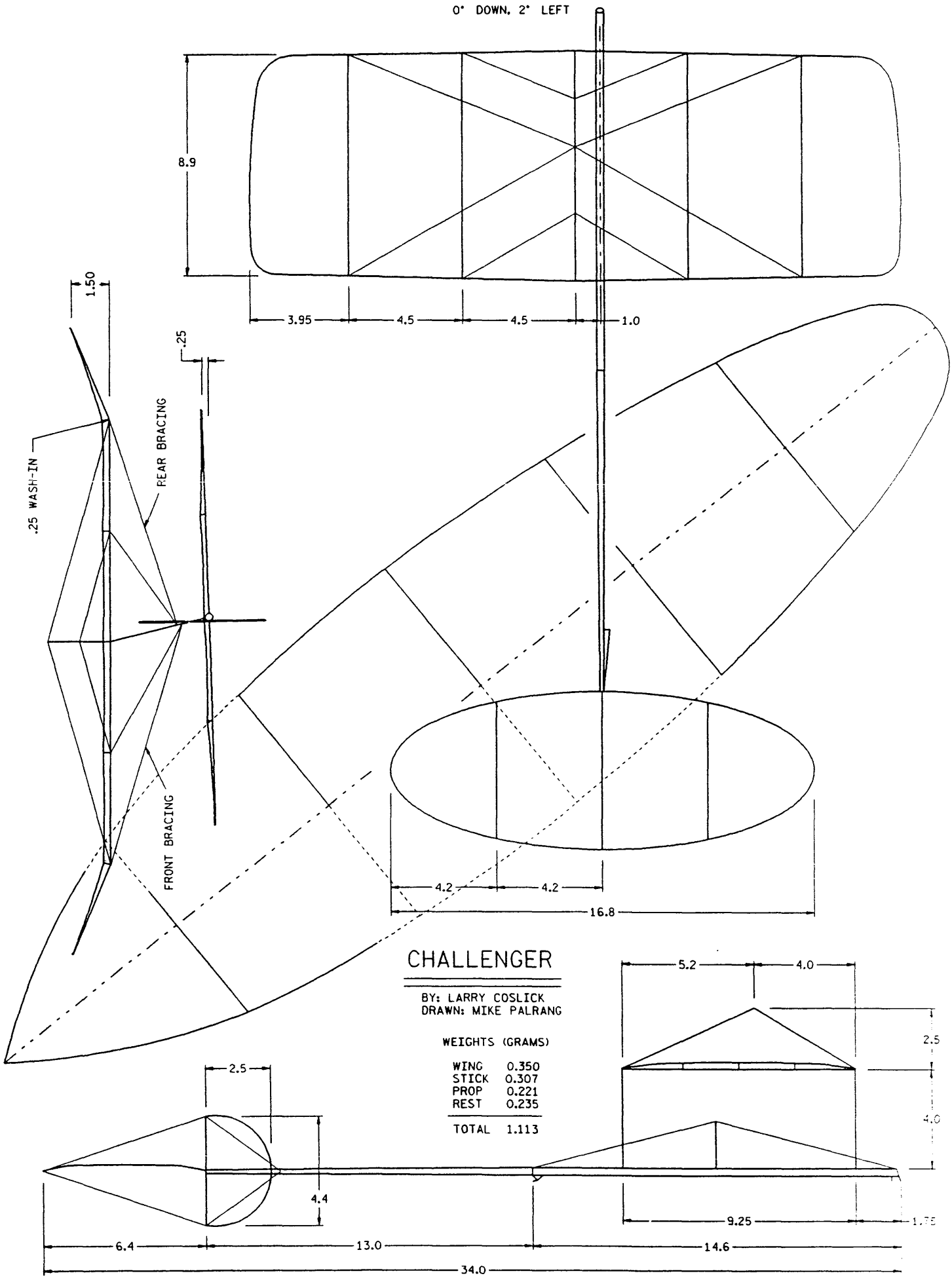
Wash In, Wing Left panel 1/8" Wash Out Left panel. _____

Wash Out, Right panel 1/16" Wash In, Right panel _____

Wash In Stab, Yes _____ No _____ How Much _____

Down Thrust. _____ Left Thrust. 4 Special trim instructions.

4 degree negative stab and 1/8" left crook in boom when glued to Motor Stick. Wing Incidence 0.


0° DOWN, 2° LEFT
8.9
3.95
4.5
4.5
1.0
1.50
.25
.25 WASH-IN
REAR BRACING
FRONT BRACING
4.2
4.2
16.8
CHALLENGER
BY: LARRY COSLICK
DRAWN: MIKE PALRANG
WEIGHTS (GRAMS)
WING 0.350
STICK 0.307
PROP 0.221
REST 0.235
TOTAL 1.113
5.2
4.0
2.5
4.0
2.5
4.4
9.25
1.75
6.4
13.0
14.6
34.0

MODEL NAME: H L STICK BUILDER: Larry Coslick

MOTOR STICK ROLLED

Density # 3.78 Grain C Length 14.5" Cut Width .825"

Sheet Weight .279G Cut Weight. .17G Glued Weight .176G

Did you use boron. Yes. No. Boron size .004 Boron Placement 12:00,3:00,6:00,9:00

Special Instructions Thrust bearing and rear hook were installed as per Steve browns article in INAV Issue #84 1995. Forming tube .250"

Thrust Bearing, Wire size .013" Other _____ Web. Density 4.75#

Thickness .018" Rear Hook .013" Web. Density 4.75#

Thickness .018" Paper Tubes. Material used Condenser paper

Adhesive Used Nitrate Dope Special Instructions 1.9" bracing post, .003 boron on each side. .040" bow in Motor Stick.

M/S complete with tubes, post, wire. Weight .307G

STAB

Outline. Density 5.2# Grain A **Leading** Edge Center, W. .025"

H. .060" Tip. W. .022" H. .030". **Trailing** Edge Center, W. .025"

H. .060" Weight Leading Edge Spar _____ Weight Trailing Edge Spar _____ **Ribs**. Density 5.3# Grain A W. .029" H. .045"

Weight Ea. Rib. .008G Weight of Outline Dry. .083G

Weight Covered .105G Special Instructions See INAV Issue 87. Steve Brown article on building FID Stab & Boom. Outer ribs cut from .026X.035 4.9# A stock

FIN

Fin Floating. Post. Density 6# Grain A Dimensions of post from Center to tip. Center W. .030" H. .050" Tapered to tip W. .030"

H. .040" Fin Outline, Wood, W. _____ H. _____ Fin Boron.

Boron Size. .004 Weight Dry. .011G Weight Covered. .015G

Special Instructions. .003" Boron .4" long for Fin adjustment. Glue to L/E of Fin and push boron through Boom. Tack glue in place.

MODEL NAME HAND LAUNCHED STK. BUILDER Larry Coslick

WING

Leading Edge Spar. Density 5.65# Grain AB Length 18" Width .033"

Height .045" Weight .035G. **Trailing Edge Spar.** Density 5.5# Grain A

L. 18" H. .045" W. .033" Weight .032G **Tips.** Density 4.25#

Grain A Tip at L/E. Width .029" Height .040" Tip at T/E. Width .029"

Height .040". Weight for 2 Tips. .045G **Ribs Standard.** Density $.78#

Grain C W. .031" H. .045" Weight Ea. .016G

Ribs Compression. Density 5.1# Grain A Top of Rib W. .030" H.

.030" Bottom of Rib. W .029" H. .040" Upright .004 B Weight Ea. .025G

Wing Posts Density 6# Grain A L. 4" W. .032" H. .062"

Boron, Yes, No. Boron Size. .004 Boron Position 1 each side

Posts Round, Posts Rectangle. Weight for 2 finished posts. .038G Cabane. Density 4.5#

Grain A Cabane Front. L. 5" W. .023" H. .052"

Tapered to W. .023" H. .032". Cabane Rear. L. 6" W. .023"

H. .052" Weight .017G. Wing Bracing Wire. .0005 Wing Dry. .219G

Wing Covered. .280G Wing Weight Complete. .350G Special Instructions

Dihedral breaks are glued with alaphetic. .030"X.2" patch of condenser paper glued over each dihedral break with Ambroid to prevent tips from possibly separating from spar when placing dihedral in tips.

Boom

Boom Rolled. Density 4.6G Grain C Sheet Weight .19G

Cut Weight .85G Width Front .72" Width Rear. .36"

Glued Weight .09G Boron, Yes, No. Boron Size .003 Boron Position

12:00, 6:00 Finished Weight. .105G Special Instructions

Prop, Covered Blades

Prop Spar. Density Unknown Grain AB Spar Length 10.5"

Dimensions at prop shaft, W. .065" H. .072" Dimensions at Tip. W. .035"

H. .035" Spar Weight. (2) .06G Prop Shaft Wire Size. .013"

If prop is V/P or V/D, detail mechanism on separate sheet of paper. Prop Outline, Wood. Density 4.3#

Grain A W. .025" H. .025" If Boron, Boron Size _____

Ribs, Density 4.75#

Prop ribs

Grain C W. .023" H. .025" Prop weight dry. .205G

Covered .222G

Prop, Pitch

Give prop pitch at 45 degrees and one inch from tip. Pitch at 45 degree _____ Pitch 1 inch

From tip. _____. If V / P, Low pitch 32 High pitch Unknown

If V / D, Diameter when extended _____ Diameter when folded. _____

Special Instructions on prop construction See drawing on installing hinges and INAV Issue 89, Oct 1996.

RUBBER

Loop Length 15" Width .069" Rubber Vintage, Month and Year

8 1993. Weight of Loop. _____ Turns 2075

Back off Turns. 10 Launch Torque in inch ounces. .42 Turns Left 0

Do you use O rings. Yes. Yes No. _____ TIME 41:10 1997 USIC

TRIM

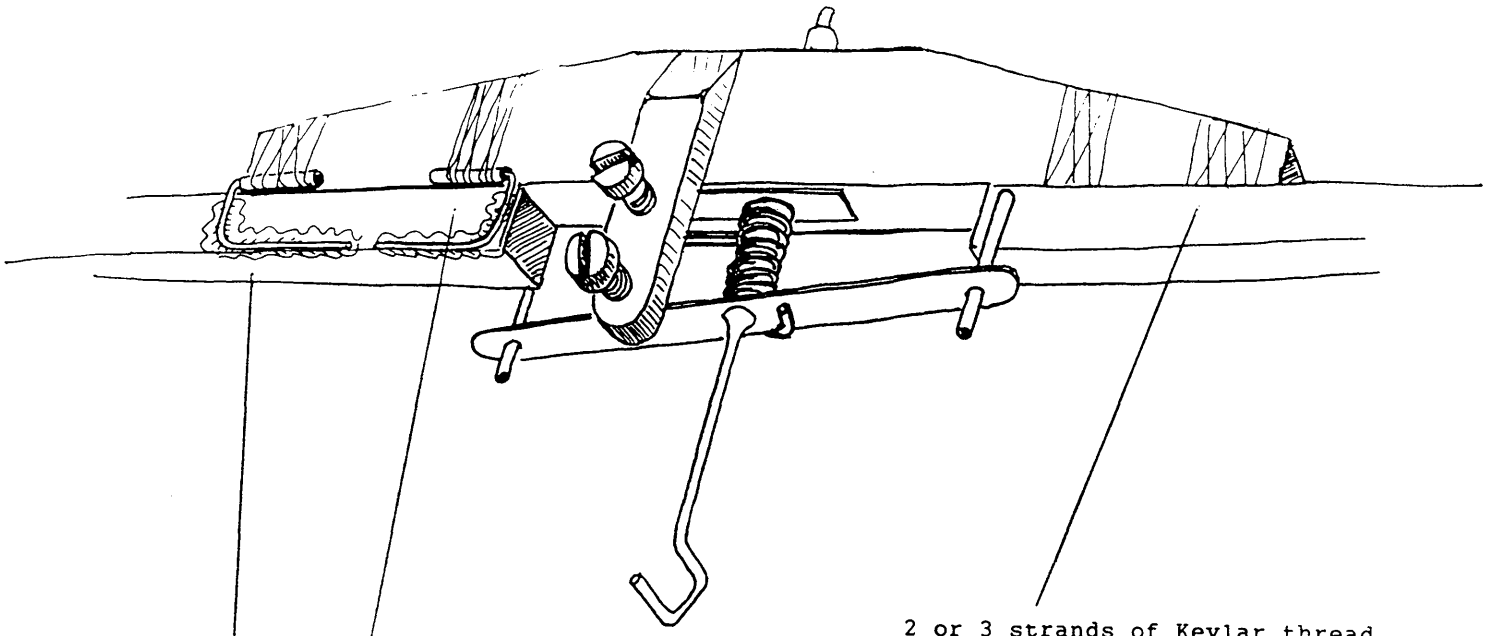
Wash In, Wing Left panel .2" Wash Out Left panel. 0

Wash Out, Right panel 0 Wash In, Right panel 0

Wash In Stab, Yes 0 No _____ How Much _____

Down Thrust. 0 Left Thrust. 2 Special trim instructions.

Adjust decalage in stab until model flies nose high on low torque.



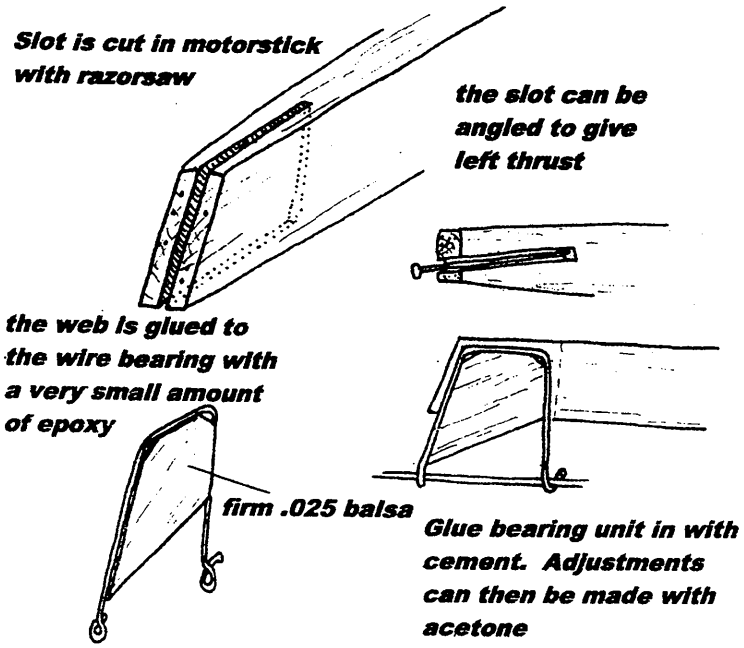
CHALLENGER

BY: LARRY COSLICK
DRAWN: MIKE PALRANG

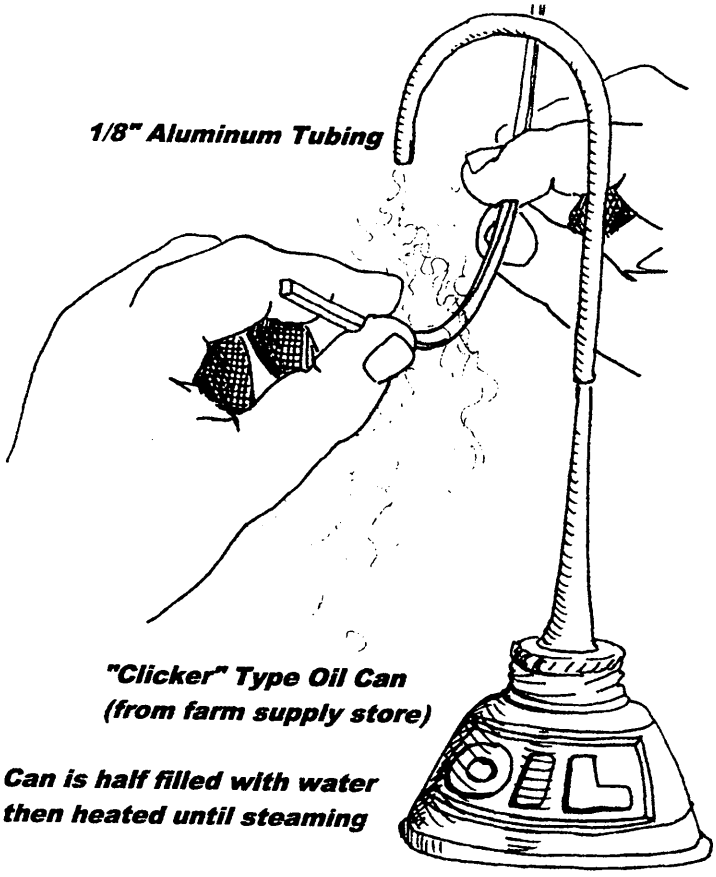
Installing Wire Hinges

Lay a piece of .006" Hypodermic tubing on a sheet of 1/4" balsa and cover with clear tape. Cut off 4, .080" long pieces of tubing with a cut off wheel. Hold each piece in a Forcep and hone the ends flat until each piece is about .065" long.Clean out the hole with a sharpened piece of .005" wire. Thread 2 of the hinges on a 1 inch piece of straight .005 music wire. Position the tubing on the hub as shown on the drawing. Tack glue each hinge in place and then remove the wire. Wrap each hinge with 2 or three strands of Kevlar thread. Apply 2 light coats of Ambroid or Duco to the hinge and thread. Bend the .005" wire parts as shown and glue in place. A .1X.5" patch of Jap tissue can be placed over the wire parts, but it is not necessary. See Steve Browns article on prop construction in INAV Issue 89, 1996.

Small Parts, Inc.
PO Box 4650
Miami Lakes, FL.
33014-9727



EZB/Pennyplane adjustable bearing

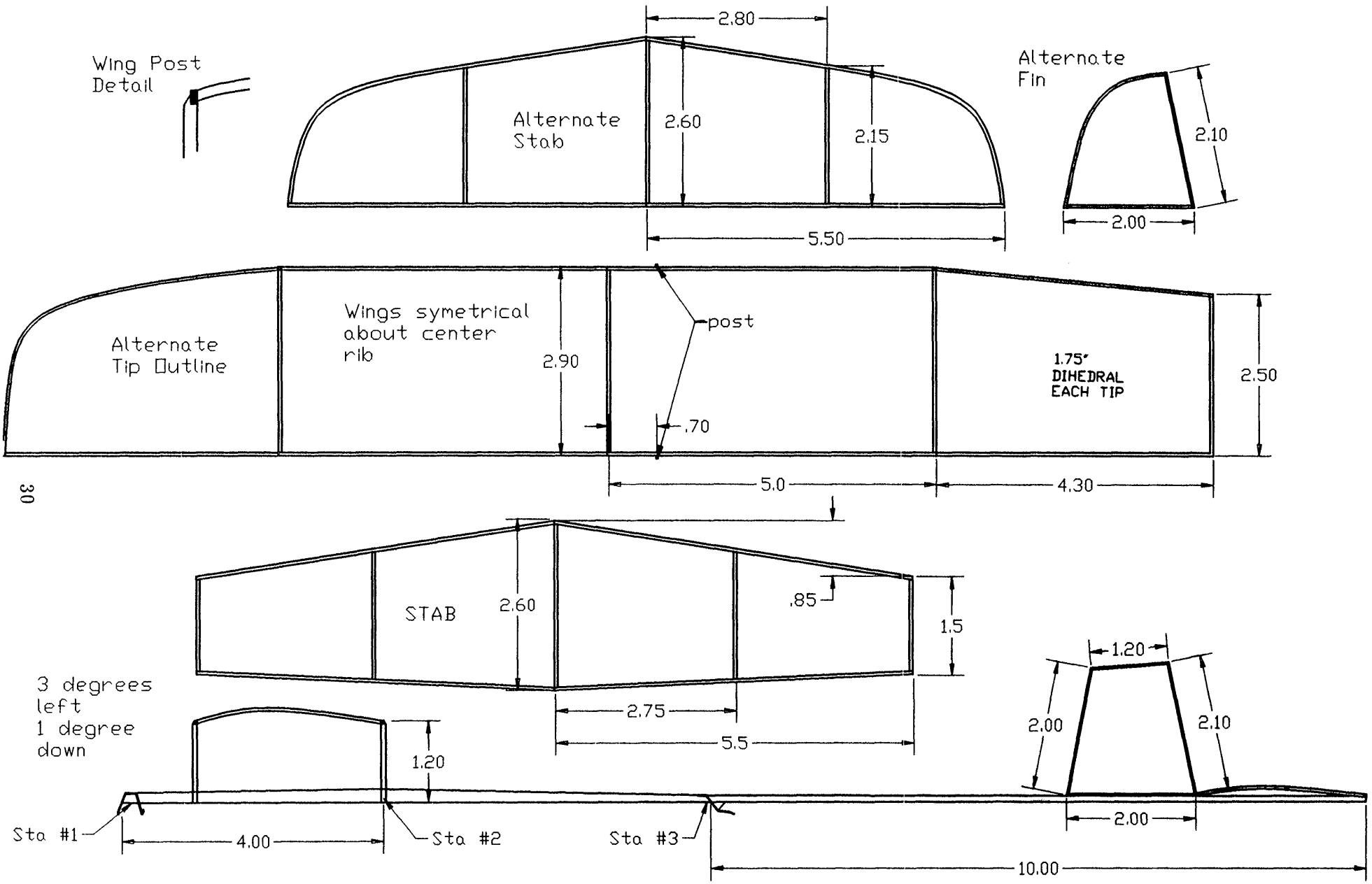


the Gene Joshu Steam Generator

1998 International EZB Contest
Moscow, Idaho

The 1998 International EZB contest will again be held following the three day Kibbie Dome Annual. There truly is an international flavor to the event, because it is flown in rounds. The winners are decided by the best 2 of 6 flights.

The International will feature something different in 1998, a novice EZB class. All current EZB rules pertain. "Novice classification for this event only. A novice is one with limited flying skills in this event. If necessary the CD is to make a final determination. A novice in the International will remain a novice until they exceed 18 minutes on any one flight. Novice fees will be $20.00 and all other fees are $40.00.



Beginner EZB

"NOVICE" EZB

WING

L/E CENTER SECTION .050" X .062" NO TAPER 5.5#to 6#

T/E " " " " " " A Grain 5#

TAPER T/E TIPS .050"X .062" To .050"X .045" 4#

WING RIBS C GRAIN .029"X .062" 5#

POSTS .062" ROUND 7#

WING DRY .18 Gram

COVERED .23 Gram

WITH POSTS .25 Gram

STAB

OUTLINE .025"X .040" A Grain 5#

RIBS .020"X .040" C Grain 4.5#

STAB DRY .04 Gram

COVERED .065 Gram

FIN

.030"X .030" 4#

FIN COMPLETE .01 Gram

MOTOR STICK 9" 5#

STATION 1 .140"W X .195" H

STATION 2 .150"W X .215" H

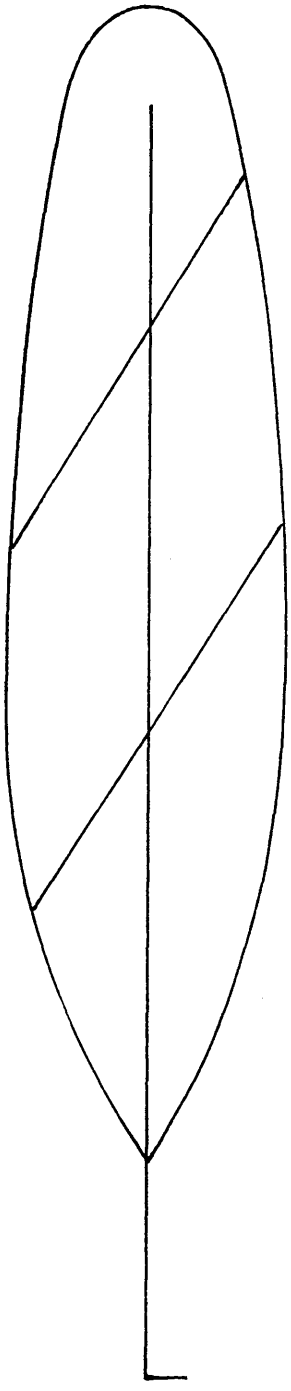
STATION 3 .140"W X .140" H CUT WEIGHT .25 Gram

FINISHED WEIGHT WITH HARLAN BEARING, .012" REAR HOOK,

AND PAPER TUBES .3 Gram

BOOM 10" A Grain

.080"W X .1"H TAPERED TO .035"W X .045"H .07 Gram



PROP SPAR

SELECT CLEAR A GRAIN BALSA AND SAND A TAPER IN A SHEET OF .062"X 2"X 7". 6#. DOUBLE TAPER (2) SPARS TO .062" X .075" TO .032"X .032". JOIN WITH A LONG SCARF JOINT

WIRE HOOK .012"

WIRE HOOK AND SPAR .05 TO .06 Gram

(2) .008 TO .009 C GRAIN .15 Gram

PROP 14"X 25P .2 Gram

RUBBER TAN II .050" X 14"

1998 International Mini-Stick Postal Contest

The Brain Busters invite all indoor flyers to take part in the 1998 International Mini-Stick Postal Contest to be held over the winter period. The rules for the contest will be as follows:

1. The contest is open to Indoor models that comply with the Living room/ Mini-Stick rules.
2. Contest flights are to be made between 1 Jan. 1998 and 31 Mar. 1998.
3. Any number of flights can be made at any number of sites.
4. All contest flights to be timed by someone other than the flyer.
5. All contest flights are to be recorded on an official results form. (Included in this issue. Copies can be made.)
6. Best single flight time wins, after the flight time has been corrected for different ceiling heights. Ceiling height to be measured as per the FAI, but with a 5-meter diameter circle. The correction factor is 627 divided by (167 plus 46 times the square root of the ceiling height in feet). The times in seconds will be multiplied by this to give the corrected time.
7. Prizes will be awarded dependant on the number of contestants.
8. All results forms to be returned no later than 10 April 1998 to the address below.
9. Entry is free to all contestants
10. Results will be sent if a SASE is included with the results form.

Send your results to:

Abram Van Dover
112 Tillerson Dr.
Newport News, VA 23602

Mini-Stick Model Rules

Monoplane, max span	7.0 in.
Max wing chord	2.5 in.
Motorstick length	5.0 in.
Max model (less prop)	10.0 in.
Stab (tail) area	max= 50% of wing
Covering	plastic/paper (no microfilm)
Propeller	Wood max dia. 7.0 in.
Minimum weight	(.430 grams) .015 Oz.

*Special rules for very small rooms only!
Steering 4 ten second steers*
Attempt 15 seconds or more*

1997 U.S. Indoor Championships
Video tape by Harding Aero Productions
4782 Unity Line Rd.
New Waterford, OH 44445
(303) 457 1600
$19.95 + $3.00 postage

Send Order to:
Richard W. Obarski
2112 N. Halcyon Dr.
Sun City Center, Fl 33573
Phone: 813-634-8683

SPECIFICATIONS

	Weight In oz. Per* 100 sq in.	Thickness in inches
Ultra Film (Ray Harlen)	.0045	.00006
Ultimate (Wayne Trivin)	.00366	.000047
PM2L	.00271	.0000353
Microfilm	.0015 Appx.	Varies

* above weights determined using a Harlen beam scale. Weight for microfilm varies depending on sheet color after pouring.

PM2L Pricing as of 1/1/98

$17.00 for 15 ft. Roll P.P. USA & CANADA
$32.00 for 30 ft. Roll USA & CANADA - P P
$20.00 for 15 ft. Roll P.P. Foreign
$38.00 for 30 ft. Roll P.P. Foreign

Indoor Postal Contest Results Form

Club Name_____

Date of Contest____/____/____ Site Name_____

Ceiling Height_____Feet

Contestant Name SMAE No. Age (if Jr.)	Address	Time in Seconds	Timer Initials	Leave Blank
		1.		
#		2.		
		3.		
		4.		
		5.		
		1.		
#		2.		
		3.		
		4.		
		5.		
		1.		
#		2.		
		3.		
		4.		
		5.		
		1.		
#		2.		
		3.		
		4.		
		5.		

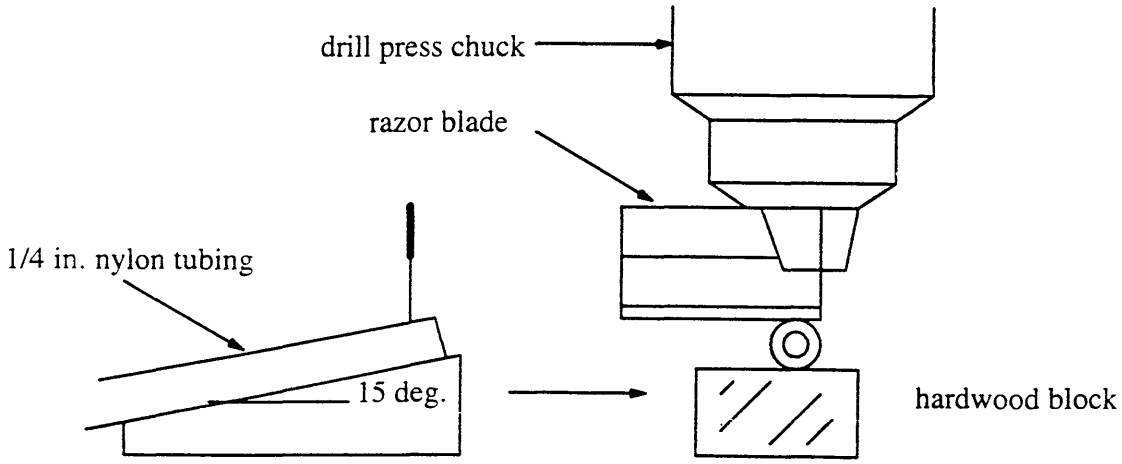
Technical Stuff:

Rubber stripping – How do you accurately measure the width of a rubber strip? A few thousandths can make a significant difference in airplane performance if you're trying to optimize things. I have a fancy electronic micrometer / caliper, but it's hard to know when the jaws are just contacting the edges of the rubber strip, even using magnification.

A better method is to determine the weight per unit length. Cut a 1 ft. length of each batch of stripped rubber, as well as a piece of the parent material. A 1 ft. piece of 1/4 in. Tan II for example weighed 2.06 gm. Assuming it is really .250 in wide this gives width/weight ratio of 0.1214 in/gm. A 1 ft sample of rubber I stripped for my pennyplane weighed 0.72 gm. Therefore the width of the strip is 0.1214 in/gm x 0.72 gm = .087 in. My scale has a resolution of 0.01 gm, which translates into a width measurement resolution of 0.0012 in. This is better than the repeatability I can get with the micrometer caliper. Plus the resolution can be improved by weighing 2 or 3 ft. length samples instead.

Another advantage of the weight method is that it gives a length-averaged width value incase there are width variations. The weight samples can be used afterward for winding tests. Tie the 1 ft. sample into a 5 in. loop, lubricate it, and wind it to the breaking point to get the max turns per inch.

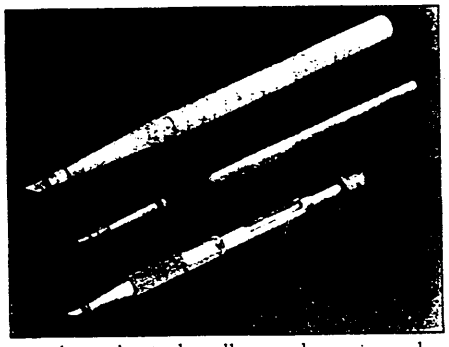
Cutting O-rings for rubber motors – I always find it a tedious chore to cut plastic rings to use on indoor rubber motors. This tip takes some of the hassle out of it, I think. Mount a single edge razor blade between two jaws of the Jacobs chuck in your drill press to form a little guillotine. (If you don't have a drill press – what are you waiting for?) Make a wedge-shaped anvil out of a scrap of hard wood. The angle compensates for the drift of the blade to give a more or less perpendicular cut. The main advantage is that you can slowly and safely drive the blade through the nylon tube, and don't have to grovel around on the floor looking for the rings that tended to fly off like bullets when I cut them by hand.



Sapphire Blade Knives

Sapphire blade knives have diamond knife qualities at a fraction of the diamond knife price. Carefully honed cutting edges with superior sharpness insure minimal tissue damage. The knives are available with retractable blades,

PRODUCTS



metal or plastic handles, and varying edge angles. World Precision Instruments. For information call 941-371-1003 or circle 137 on the Reader Service Card.

1997 AMA INDOOR NATIONALS AND THE SIXTEENTH UNITED STATES INDOOR CHAMPIONSHIPS
"MINI-DOME"- EAST TENNESSEE STATE UNIVERSITY
JOHNSON CITY, TENNESSEE
MAY 28 THRU JUNE 1

Send Entry Payable To:
USIC 97, 5432 Haft Rd., Cincinnati, OH 45247

NON AMA EVENTS REGISTRATION

NAME _____ AMA # _____

STREET _____ JR [ ] SR [ ] OPEN [ ]

CITY _____ STATE _____ ZIP _____

PHONE # _____

I hereby certify that I understand all of the rules under which I will compete and will diligently follow the Official AMA Safety Code as well as any rules that may be established on site and will apply the use of accepted common sense in all my flying and affairs at the contest site.

SIGNATURE _____

FEES
Basic entry fee includes one event.

Entry fee	**$ 10.00**	_____
Junior and Senior entry	**$1.00**	_____
Additional events, OPEN	**$5.00**	_____
Additional events Jr & Sr	**$1.00**	_____
Banquet (Per Person)	**$21.00**	_____
8' Table & 2 Chairs	**$14.50**	_____
Dormitory cost (See below)		_____
Total Fees	**$**	_____

DORMITORY COST AT ETSU RESERVATION

Single occupancy	$26.50 per night
Double occupancy	$26.50 per night
Triple occupancy	$41.25 per night

*Please Indicate Reservation In:

	May 28	May 29	May 30	May 31	June 1	No. of Rooms
Single Occ						
Double Occ						
Triple Occ						

Name of room mates if known.

_____

No linen will be provided, so bring your own sheets, pillow cases, towels, etc. For double and triple occupancy rooms, you must recruit your own room mate(s). Some rooms are with baths and others have adjoining baths, (shared). NOTE: a $25.00 fee will be charged for lost or unreturned keys. *NO EXCEPTIONS.*
REBATES WILL BE MADE AS APPROPRIATE ON ROOMS
DORMITORY HOUSING WILL BE IN CARTER HALL.

NON-AMA EVENTS

[x] Events entered

[ ] Pro 20
[ ] 35 CM
[ ] FROG
[ ] No Cal
[ ] Golden Age Scale
[ ] Pistachio
[ ] High Wing Mono
[ ] WWII
[ ] Unlim Rbr Speed.
[ ] Coconut Scale
[ ] Mass Launch P-24

MUST BE POSTMARKED BY MAY 22, 1997
LATE ENTRY FEE OF $10.00 PAYABLE ON SITE

MAKE CHECKS PAYABLE TO USIC 97

Banquet to be held on the 30th of May 6:30 P.M at the Holiday Inn. (Formerly the Sheraton Plaza)

In Case of Emergency, Please Contact:

Name _____

Street _____

City _____

State _____ Zip _____ Phone: ( )_____

USIC 97
5432 HAFT ROAD
CINCINNATI, OHIO 45247

1997 Indoor Free Flight National Championships

East Tennessee State University, Memorial Center Arena Johnson City, TN

May 28 - June 1, 1997

AMA HQ USE
Type _____
Amount _____
Date _____
Entered by _____

AMA SINCE 1936

Contestant Information:

1. ☐ JR ☐ SR ☐ OP
2. Date of Birth _____ 3. AMA # _____
4. Name _____
5. Address _____

City _____ State ____ Zip _____

6. Day Phone (_____) _____

Fees are a result of AMA and SIG negotiation. Entry forms postmarked after April 28, 1997 must include late registration fee of $15. Requests for refunds must be in writing and postmarked by April 28, 1997.
ABSOLUTELY NO REFUNDS AFTER APRIL 28, 1997.

FEES:

Entry (1 event)		$ _____
Additional events:	10 X _____ =	$ _____
Late fee if applicable:		$ _____
Site donation (optional):		$ _____
Total Enclosed:		$ _____

☐ Check ☐ VISA ☐ MasterCard Exp. date __/__

Card # ____-____-____-____

Event/Schedule

Wednesday, May 28
Practice Day

Thursday, May 29
- ☐ 201 *HL Stick
- ☐ 202 Intermediate Stick
- ☐ 203 *F1D
- ☐ 204 Cabin ROG
- ☐ 209 Helicopter
- ☐ 210 Ornithopter
- ☐ 211 Autogiro
- ☐ 212 HL Glider
- ☐ 214 ROG Stick
- ☐ 218 Standard Cat. Glider (JS) (O)
- ☐ 219 Unlimited Cat. Glider (JS) (O)

Friday, May 30
- ☐ 205 Manhattan
- ☐ 207 Pennyplane
- ☐ 215 Bostonian

Saturday, May 31
- ☐ 208 Limited Pennyplane
- ☐ 505 Peanut Scale

(201, 203 finish flying)

Sunday, June 1
- ☐ 206 Easy B
- ☐ 213 Kit Plan Scale
- ☐ 220 Ministick
- ☐ 507 Flying Rubber Scale

**Events will finish flying on Saturday, May 31.*

Banquet will be Friday, May 30 at 6:30 PM.

Fees:
Open: $25 first event, $10 each additional
Jr/Sr: $10 flat fee (any number of events)

FOR ANY AND ALL EVENTS: I hereby certify that I have read all information accompanying this entry form, and that models entered by me will be built by me (if required) and flown in compliance with the current Competition Regulations or FAI Sporting Code if it applies, and will previously have been successfully flight tested and proved to be airworthy in accordance with the Official AMA Safety Code.

_____ _____
(Applicant's Signature) (AMA Number)

IN CASE OF EMERGENCY PLEASE CONTACT:

NAME _____ Day Phone _____ Relationship _____

Address _____

City, State, Zip _____

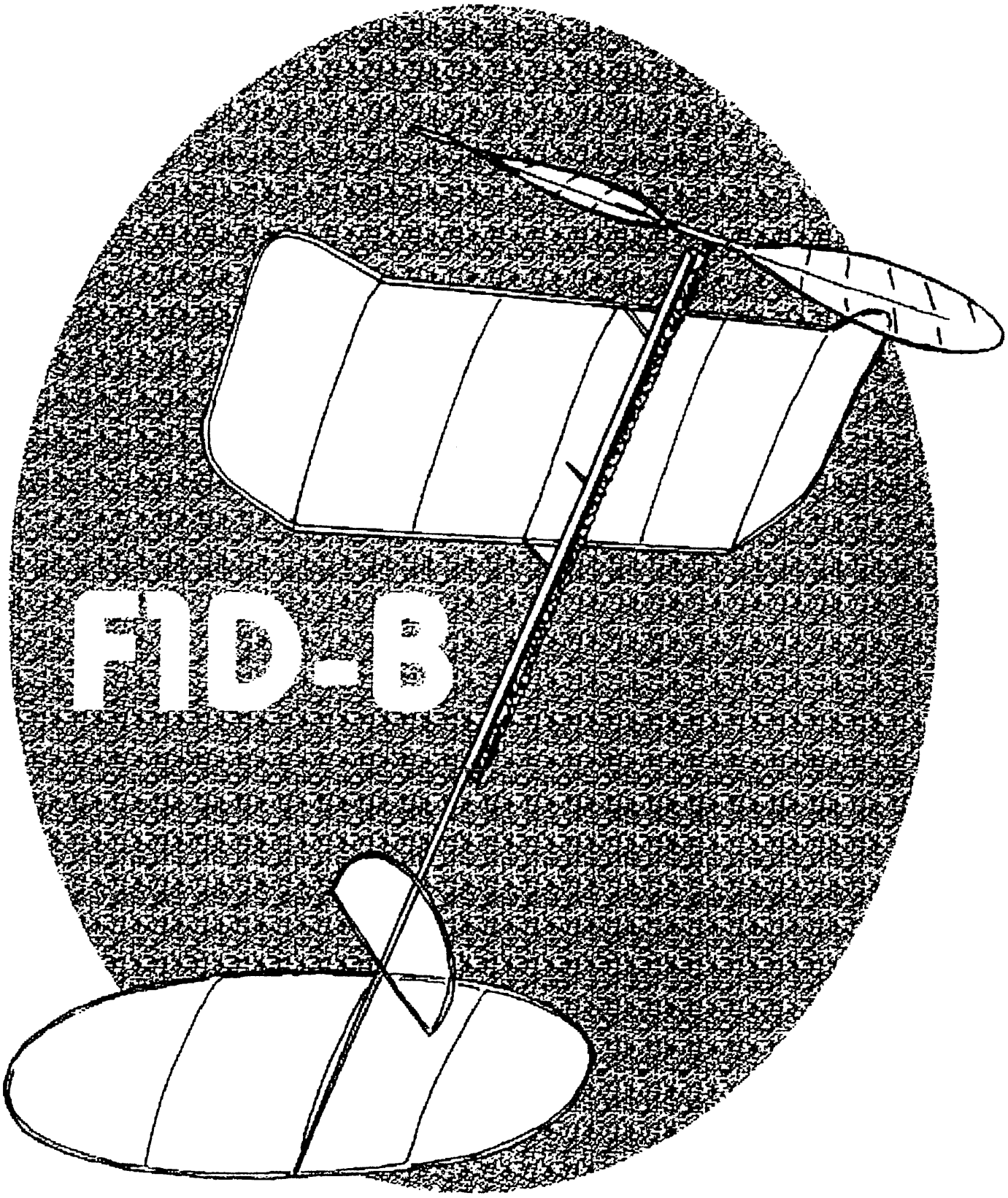
APPLICANT CHECK LIST:
- ☐ Double check and verify correct fees are enclosed
- ☐ Check(s) signed and payable to AMA
- ☐ Name, AMA number, and complete address shown
- ☐ Emergency contact information (above)
- ☐ Have read all schedule and processing information
- ☐ All credit card information is given (expiration date, card number, card company)
- ☐ All events are indicated
- ☐ No conflict exists in "one only" events, if applicable
- ☐ Team entry is in compliance with AMA rule book, if applicable
- ☐ Frequency information, if applicable, is complete and correct
- ☐ Signature above

Send registration form to AMA Headquarters, 5151 E. Memorial Dr., Muncie, IN 47302. Attn: Competitions Dept.

INAV

Issue # 93

April 1998



INDOOR NEWS AND VIEWS (INAV) IS PRODUCED
IN ST LOUIS BY LARRY COSLICK, GENE JOSHU,
HOWARD HENDERSON, BILL MARTIN,
STEVE GARDNER, AND ROY WHITE

INAV DUES ARE

U.S.	$: 9.00/year
Canada	$12.00/year
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4 to 6 issues/year depending on
budget and availability of material

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Phone: 314-822-3980

(INAV) can be reached via computer E-mail at the following
addresses:
AEROBAT77@ AOL.COM (Steve Gardner)
H PIET H@AOL.COM (Howard Henderson)

THE PRODUCERS ARE LOOKING FOR VOLUNTEERS TO TAKE OVER PUBLICATION OF INAV. ANYONE INTERESTED SHOULD CONTACT HOWARD HENDERSON.

Jim Clem

We at INAV asked Jim to send us some information about his modeling history so we could publish a short biography on him. We consider him to be one of the finest men in our sport and most worthy of our attention. This is to entire text as he sent it to us. We had not intended to go into this level of detail, and Jim asked us to edit it to whatever length we needed to, but after reading it we felt that it was far too interesting to trim in any way. If you have not been fortunate enough to meet this wonderful guy this text will have to do until your luck improves.

S.G.

I was born in Dallas, Texas on September 12, 1923 and am now 74 years old. I studied Mechanical Engineering at SMU, where I met my wife, Fran. We've been married for 38 years and have 2 sons:

Jimmy, age 37 and Mike, age 32. We also have a 2-year old Granddaughter, Alexandra. Both boys have always been modelbuilders but have had to put their hobby aside for a while to make their living. Jimmy was a Junior National Champion one year, and Mike had the walls of his room papered with Junior Indoor Records. I really treasure those years when the boys were young.

I have been a modelbuilder as long as I can remember, and it's certainly been fun. I built my first model in 1932. It was a present for my 9th birthday, a Boeing Fighter kit from Cleveland Model Airplane Company. It was a "Lo-Cal," a beginner's model, and I still have the tube it came in and the plans. There were no contests in Dallas at the time, so I didn't fly my first contest until April 14, 1936. It was held by a local hobby shop, and I won with a 24 ¼ second flight. In town that weekend was Colonel Clarence Chamberlain, the second man to fly the Atlantic, who was barnstorming with his Curtis Condor and taking up passengers. As the prize for first place, I ended up getting a ride with Colonel Chamberlain and had my picture taken with him. I still have that picture. In the summer of 1936, we had the Texas Centennial in Dallas and had a big contest in the middle of the summer. The gang came down from Tulsa - names come back to me like Alvie Dague, Bruce Luckett, Roy Wriston. They were really up to the state-of-the-art in Wakefield and they really wiped us out! After that, we worked hard to become competitive like them, but we were always lagging behind.

I flew nothing but Free Flight Rubber until 1938 when I got my first gas engine for Christmas. It was a Mighty Midget and a kit job. Boy did I have fun! My first gas model was a Flying Quaker, a big 7-foot job powered by the Mighty Midget, which didn't make much power. I guess there were some successful flights, but nothing very extraordinary. I moved on to Bucaneers, Clippers, Zippers and went to a lot of contests in this area. We would all gang up in one car and go to Corpus Christi, San Antonio, Oklahoma City or Fort Worth. It was quite a bit of fun and kept us out of trouble as teenagers. I built some indoor models too at this time, but didn't really know what they were supposed to do, since I had never actually seen one except in the model magazines. I also took the formulas and made and poured my own film.

In the Spring of 1941, Carl Goldberg was working for Comet and was on a tour of the United States, lecturing at various places. He was a friend of Johnny Clemens who had the hobby shop here. (I also worked for Johnny during that period and we became life-long friends.) I met Carl and he helped me get my Baby ROG going. The Nats were held in Chicago that year and that was my first Nats. Carl and Vito Garofalo helped me put the microfilm-covered Baby ROG together, build a box to carry it in, and fly it. It did almost 12 minutes, not enough to be very competitive. It was really fun to be able to know Carl, who was as helpful to me as he was to everybody else. And Vito became a life-long friend until his death recently in an airplane crash when he was returning from Oshkosh. Bob Gibbs has given me the printed results of that first Nats in 1941. It was interesting - there were many people on the results who went on to great accomplishments, like Paul McCready, Bob Champine, Bob Gibbs.

During World War II, I went into Control Line Speed and continued with this thru the post-war era. I flew my first Nats after the war at the Oletha NAS, about 1948. The speed models I was flying then were called Whammies - Quarter, Half and Full. The name came from a character in the 'Lil Abner comic strip. The plans for these models were published in the January, 1949 issue of Air Trails magazine. I was in the Hobby Shop business during this era, but finally sold it and went to work for Carruth Labs, where I got started in the aircraft instrument business. I was in the

aircraft instrument business for 37 years, the last 25 of which were in my own shop, Executive Instruments, which employed 40 or more people.

In 1951 at the Dallas Nationals, I flew the first Mono-line speed model and worked with Vic and Joe Stanzel out of Schulenberg, Texas and helped develop Mono-line which became the only competitive way to go in Control Line Speed. I've always liked Control Line Speed because I like racing engines and still work with our sons in their racing engine shop.

We usually flew as a team in Control Line Speed, and our finest hour was with the team of Clem, Beasley & Kirn at the 1955 Nats at Los Alamitos NAS. Out of 6 classes flown, we won 4 1sts, a 2nd, and a 6th place, and set two new records.

I have never completely stopped building models, but there have been some slow periods when I just didn't have time to build, but did officiate at many local and national contests. I was Vice-President of District VIII in the early to mid-50's. Also wrote a Q & A column in Model Aviation and am a leader member, contest director and Life member, #L-55.

I have flown in numerous F1D programs. In 1962, I flew a Bilgri 90 cm. model, complete with "picket fence" bracing. In 1965 I flew in the finals at Lakehurst with a Charlie Sotich "Dram Dip" type model, still 90 cm. I did 31:30, so finally broke the magic 30-minute mark.

In musing over the past, I remember such events as flying in the 1964 Indoor Nats and also running the Control Line Speed events. I flew in the team select finals in West Baden in 1967 and 1983, and in Akron in 1995. Here I did 39:27 with a Bernard Hunt Tandem. Am still reaching for the magic 40. Maybe this year, because the Tandem has tremendous possibilities. I qualified for the finals in Tustin in 1997, but felt my equipment was not good enough, so I didn't go.

Then there's my long love affair with Penny Planes - 1st in NPP in 1987 at Johnson City with a 12:44, 3rd in NPP at J.City in 1988, 2nd in LPP at Moscow in 1995 and a 3rd in LPP at J.City in 1997.

Have had good success with the Frog ROG, with a 1st at J. City in 1990 of 7:51. Also did 9:41 at Lake Hurst in September of that year, with the same model. This is probably the longest Frog flight made. In 1991, had a 1st with 8:48 and in 1994, a 1st with 8:55.

Since 1989, I have enjoyed attending the Kibbie Dome annual meets and have been able to place well well in several of the events.

All my life I have been a competitor. I wish that I could just enjoy flying like my friend Don Lindley learned to do but for me flying in competition is the way to go. I continually work to build "a better mousetrap," to design in the so-called "unfair advantage." To me, just because we have done it "this way" for the last 60 years does not mean we have to continue to do so. Through the years I have done a lot of research on torsion bar hubs and blade shapes on Limited Penny Planes. In 1992, I also built the first V.P. Prop for a Penny Plane. As yet I have not been able to make it perform in high ceilings, but Larry Coslick and Ray Harlan are getting them working very well. Last year I resurrected an old concept where the thrust line is above the Center of Gravity. It works especially well for mini-sticks to help control the high torque. I call the concept the "cobra." Also this last year I have built a torque stand and a thrust stand that will measure props from mini-sticks to F1D. With these I hope to be able to measure prop efficiency and with a strobotac and a video camera, study what the prop does from climb power to cruise. The pictures of these stands were in Bud Tenney's Column on Free Flight Indoor in the March 1998 issue of Model Aviation.

Over the years I have pursued many ventures. When auto racing resumed after World War II, I raced a 1933 3-window Ford coupe "jalopy" (stock car) on the local dirt tracks. Also fooled around some with a Ford V-8 "60" midget. In 1939 I started flying 40 hp Cubs, but it was not until 1953 that I got my Private Pilot's license. Through the years I owned 3 aircraft - a Piper J5A, an Ercoupe and a Cessna 170. Fran and I did all our "courting" in the 170. In 1971 we were almost financially stable and we bought a Formula Vee, a small open-wheel road course race car that looks like a small Indy car. It races in Sport Car Club of America (SCCA) events. Our whole family has raced competition sports cars for the last 25 years, and Mike and Jimmy still build racing engines for a living.

I guess my philosophy is that the impossible takes a little longer and "whatever the mind of man can conceive and believe, it can achieve!"

In closing, I would like to thank Larry Coslick, Gene Joshu, Howard Henderson, Bill Martin, Steve Gardner and Roy White for continuing to publish Indoor News & Views. Every issue is a collectable classic!!!!

Pitch Stability in Indoor Models

By Steve Gardner

Your model is up there near the rafters doing great! All you need is another two minutes and it is still all the way up there. You can't miss. You are still watching it very closely thought, because it is not the best model for bouncing around in the clutter up there. You enter the last minute that you need to win, and the model bumps something. It is slowed a bit too much and this lets the nose down ten or fifteen degrees. The model speeds up as it dives and it looses the nice tight turn that has kept it in the center of the building all this time. One of two horrible things happens now. The model flies straight for too long before it starts to circle again and it gets into a wall, or it continues the dive until the wing starts to twist which increases the dive angle and spirals the model to the floor. Fifteen seconds too early. Rats!

What went wrong? It was just a bump. It got away from whatever it hit cleanly with the nose down only a little. You own and have seen other models that would pop right back into their flight pattern without any problem after such a bump, but this model has a real problem with recovering from disturbed flight. Why doesn't it behave like the other ones? Can it be fixed?

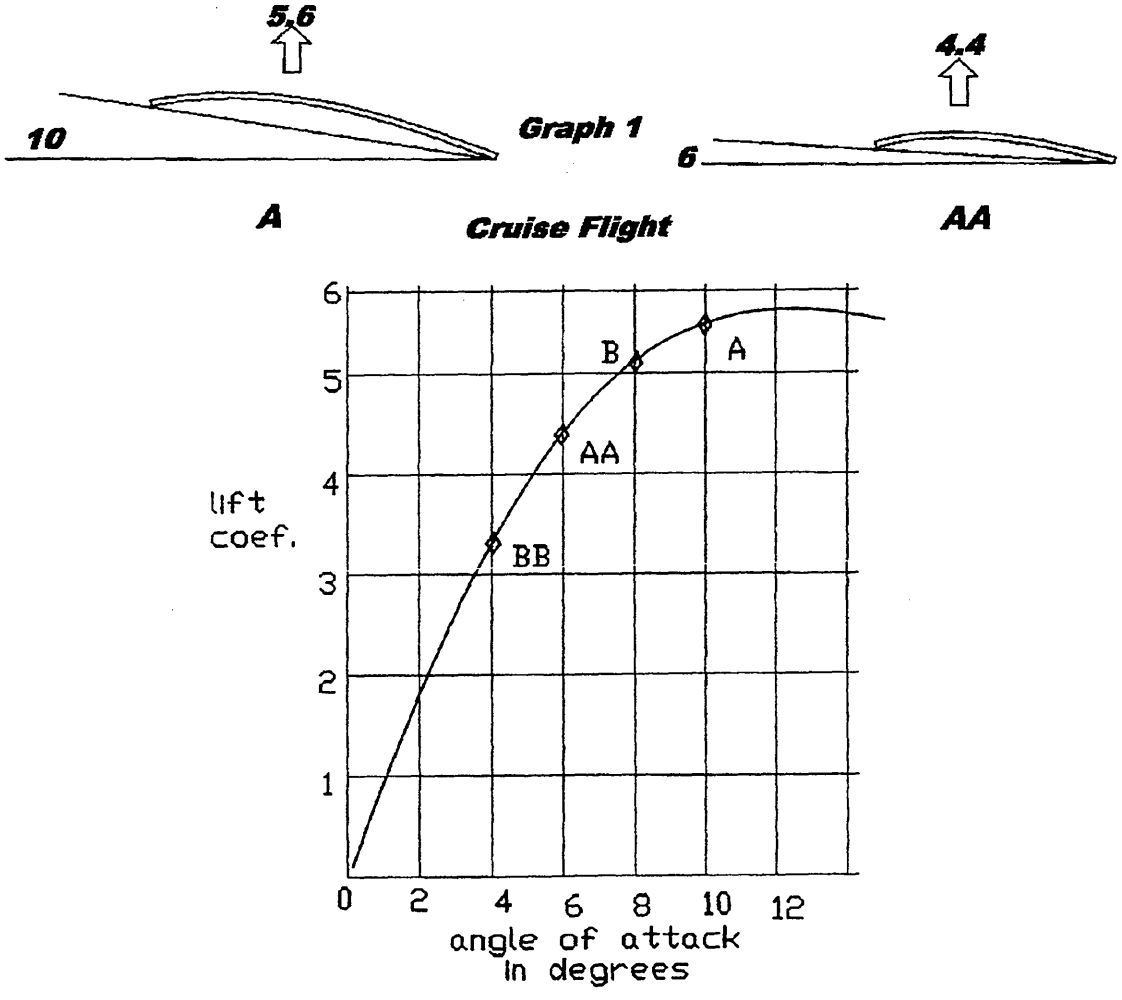
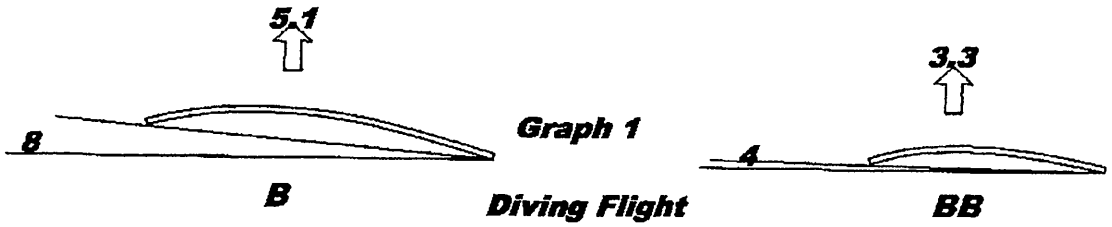
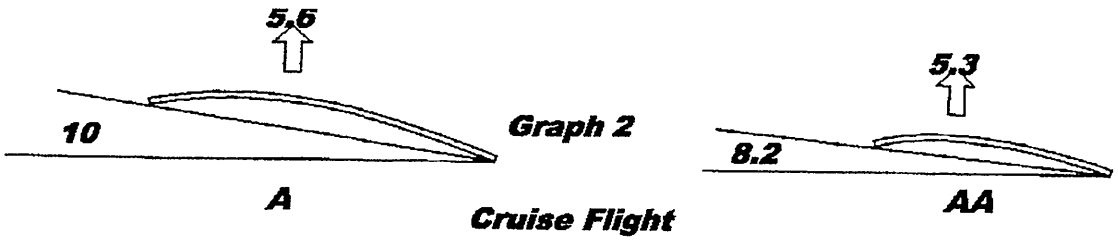


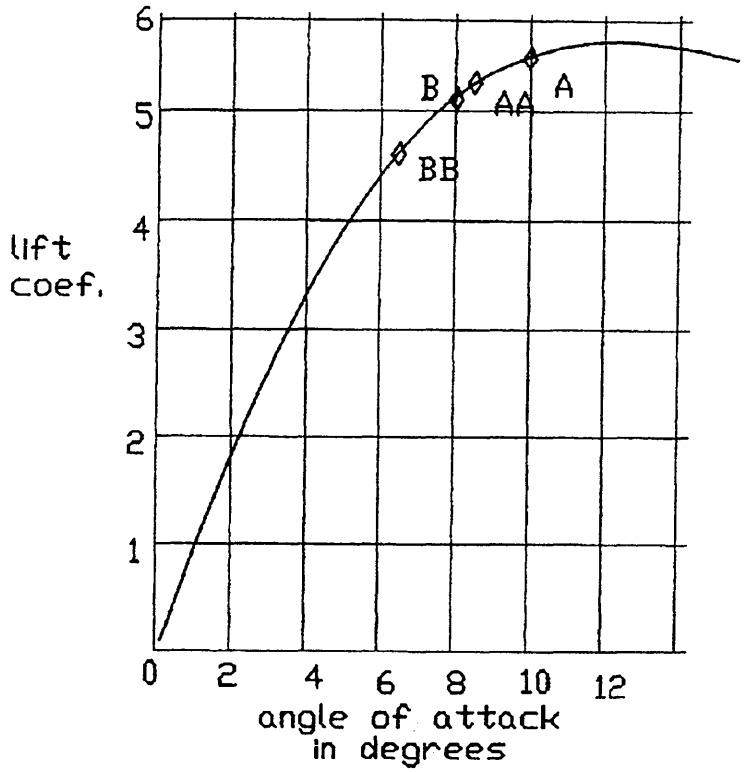
Chart 1

To start with we need to understand what went wrong. Why do some models pop their nose right back up after being disturbed and some do not? What makes a model "stable"? Look at the simple force diagram in figure 1. Imagine the balance point, or center of gravity as simply being the models weight. The wings have to hold this up for the model to fly. From the drawing you can see that the stab also helps hold up the weight, so there is lift from both the wing and the stab. When the model is in steady flight the lift from the wing and from the stab are balanced so that the weight is just supported and there is no tendency to raise of lower the models nose. The numbers indicating the lift of each surface are simply used to compare the proportions of lift from the wing and stab, and are not related to any real lift values. In this example the balanced lift condition happens when the wing 's lift value is 1.27 times the stab's lift value. (the wing carries more of the weight than the stab). If this number goes up, the wing is then lifting more than its share of the weight and so the nose comes up. The larger the number, the faster the model pitches up. Looking at the second set of points on the chart marked B, BB we can see the lift numbers for the same model just after it has been disturbed and is diving as shown here:

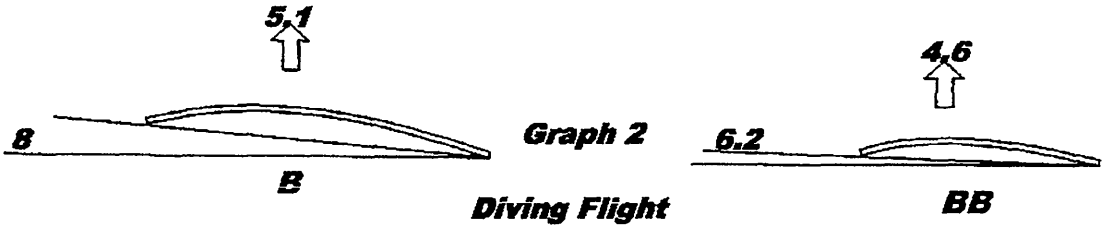


The wing is now lifting 1.55 times the stab and this will pretty quickly raise the nose of this model. From the lift chart you we can see that the lower the angle the model is flying at, the larger the nose up tendency. This lower angle is not the dive angle itself, but a diving model will have a much lower angle of flight, it can get close to zero in very steep dives. This chart, **Chart 1**, is for a model with 4 degrees of decalage. Decalage is the angular difference between the wing and stab. It has nothing to do with the angle of incidence, which is simply the surface angles compared to the models centerline. When you trim your model out you adjust the wing or stab incidence to get the model flying nice and nose high. Once you have the model trimmed out there will be a certain angle of decalage between the wing and the stab. In the next set of diagrams we show what happens when the decalage angle is too small.





The model in these diagrams has a decalage angle of 1.8 degrees, which is very small. This model will fly well as long as it doesn't get too far from its trimmed speed and angle. In steady flight it has a wing to stab lift number ratio of 1.04. Watch what happens when the nose gets down for any reason.



The lift ratio now goes to 1.11, only .07 from the steady flight. The 4-degree decalage model had .28 difference between steady and diving flight, **four times as much.** This model may or may not get its nose up before its wings begin to warp from the speed. In any case it will end up much lower than the model with more decalage.

So, all we have to do is make our models with more decalage. Right? Mostly, but we have to figure out how to do this, and how much more we need, too. There is a drawback to decalage. The more you use, the less work the stab does. A model with none will fly with the wing and the stab at the most efficient angle for the most lift, and this will maximize endurance. This model will also have to be launched perfectly, and must not run into anything at all that might disturb it. It has no margin of stability at all and a gnat's wake will send it crashing. It will just not work at all. On the other hand a model with say, six degrees of decalage will be stable even outdoors in the wind, but it will just be dragging the stab along for the ride. An indoor endurance model can not afford to give this much efficiency way. To make matters a little more complicated yet we must remember that the tail boom of many indoor models is not perfectly ridged and so the decalage can change in flight.

Things to try

Part of the problem with this "solution" is that we can not just make the decalage any amount we like. We test fly our models and move the surfaces so as to make the model fly at what our experience says is the best speed. Once the model is flying the way we feel it should then the decalage has been determined. If we mess with the angles now it will make the model fly too fast or stall the model. Now we just fly the model into the rafters to see if it will behave well or not. Let's say this one does poorly, are we really stuck with a lemon? Not necessarily, here are some things to try.

1. Move the wing back just a bit on the motor stick. This will effectively shift the center of gravity forward and so the model will need a bit more decalage. Make this change in small amounts so that you do not over do it.
2. Add a bit of down thrust to the model's nose bearing. This will also result in the model needing more decalage at a small performance cost. A possible advantage is that the down thrust will help prevent the model stalling during the initial climb phase, yet allow the decalage to be set so as to get the model nice and nose high during the cruise portion of the flight.
3. Use a stiffer tail boom. If the tail boom of your model is a bit too flexible it will actually let some of the decalage bend out of the model. Look at the model in cruise flight and make note of the upward bend of the boom caused by the lift coming from the stab. Now watch the model just after it has bumped something and is starting to dive a bit. If the bend in the boom stays much the same and the model gets its nose up right away, fine. If on the other hand the bend relaxes a great deal and the model dives for an extended period, or even speeds up and spirals in, you need a stiffer boom.
4. Make the tail boom longer. I like this one. The longer tail boom gives any difference in the lift between the wing and stab a greater lever arm to act through. A smaller amount of decalage will work well enough if the tail boom is long enough. Remember number three though when you do this.
5. Make the stab area larger. This lets the stab carry its share of the weight at a lower angle which means less decalage. This fix is not too practical because most flyers are using the largest stab the rules allow anyway. Just another reason to do so.

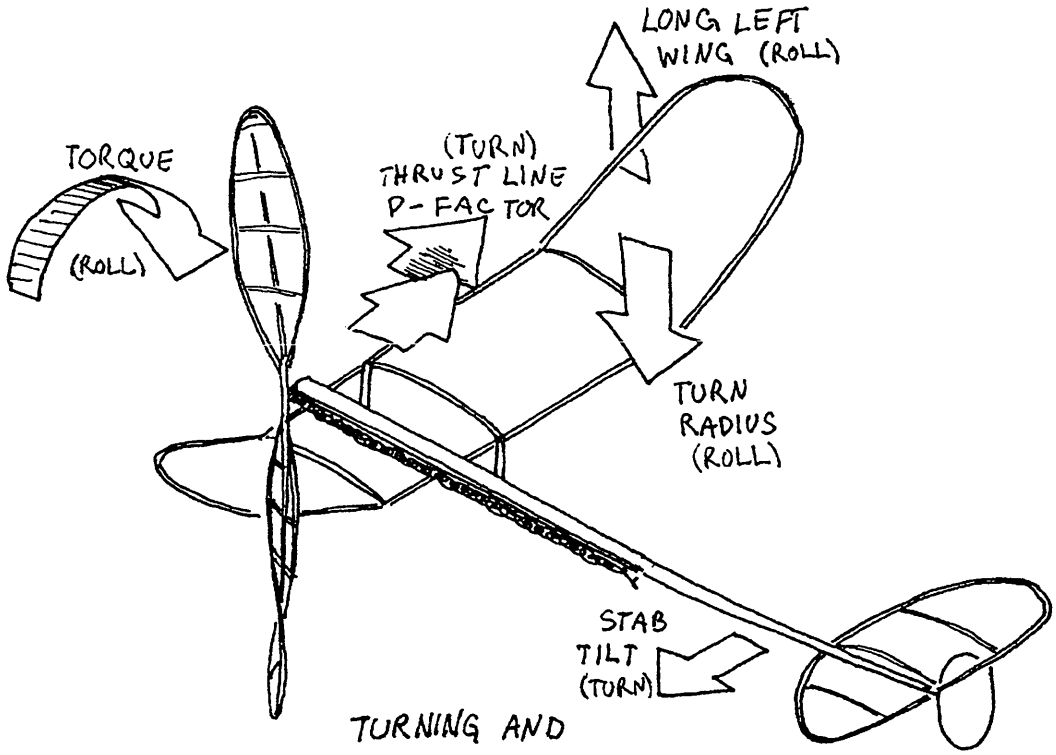
Why the model goes for the wall when it dives from a girder bump

One of the most aggravating things about bumping the ceiling is the model taking off for the wall. It will hit the girder or whatever and the nose will get down a bit and the speed will pick up some, then it will proceed to quit circling and fly straight for an extended time. If you are flying in a small area this will make it necessary to steer the model if you can. If you are way up there in a large site you may just have to watch while your model leaves the sweet spot you launched it into and heads for trouble. What is happening here? Why does a model that flies happily with a circle of 40 or 50 feet decide to open up the turn when the speed gets up a bit? Can you stop it, or at least minimize the effect?

We are kind of in a fix with this one. The reason our models do this is related to how we must trim them to get the best duration while staying within the confines of a building. We need a fairly tight turning circle without a great deal of bank angle while flying very, very slowly. The adjustments we must use to get this work well only when the model is at or very near the trimmed speed. When the speed gets up above this certain level the adjustments we use start to work against us. Imagine a hang glider flying along in level flight. The pilot decides to turn to the right. How does he do this? He pushes his weight to the right to get that wing down. Our models fly with the left wing longer than the right. This is exactly like the hang glider pilot pushing his weight to the right. He gets a right turn for his action. What do we get? If the model is flying fairly slowly we get a nice left turn. What is the difference? We have the added complication of torque, the "P"-factor, thrust line effects, stab tilt effects, and turn radius effects. The torque tends to lower the left wing and if you think it is a small force you do not fly mini-sticks!
The "P"-factor tends to yaw the model to the left and its strength is directly related to the amount the prop disk is tilted up when the model is flying. The thrust line also yaws the model to the left because that is the direction we point it. The same is true of the tilt of the stab. The last factor comes from the fact that a

model with a turn radius of 20 feet and a span of 18" has a right wing flying about 7.5% faster than the left wing. This makes the right wing lift about 15.5% more per unit area than the left, causing a roll effect to the left. Whew! Complicated!

So what is going on with our model? The torque that is applied to the model is fairly constant, causing a left roll tendency. When the model is flying at the proper slow speed the nose is up and so the "P"-factor is helping turn the model left. The slower the flight the harder the prop pulls, so the effect of the thrust line is greatest then giving use more left turn. The effect of stab tilt is related to the lift the stab is giving, and from the previous diagrams that is highest when the model is flying at high angles of attack (slowly), this effect is to turn the model left. The turn radius effect is to roll the model to the left. No wonder we need a longer left wing to hold that wing up! All that left stuff going on! So what happens to the model to make it dive straight or to the right? Imagine the model with the nose down and the speed up. The angle of attack is very low, so that the "P"-factor disappears. The stab tilt is also at its weakest point. The model is now flying faster than the prop is pitched to go, so the thrust is way down and so is the effect of the thrust line. All this begins to open the turn up, and this removes the turn radius effect. What remains is the torque and the long left wing. If the wing were the only factor we would turn right just as the hang glider does, but torque helps us out now and we end up with sort of straight flight, unless the speed gets up any higher. If it does then look out! If we have done what we can to get the model to pop the nose back up then this set of effects will quickly return the model to the nice left turn. If we have a model that takes its time getting the nose up then the model will go wandering whenever it bumps anything. It will almost never wander into a better spot than you started in, so see if any of this stuff helps you get a better flying, more consistent model.



TURNING AND ROLLING FORCES ACTING ON AN INDOOR MODEL

F1D-B
Bernard Hunt

F1D Beginner is the European class roughly equivalent to Pennyplane. The rules specify a maximum span of 46 cm = 18.2", a minimum weight of 3.0 grams, a maximum rubber weight of 1.5 grams and any covering other than microfilm. High tech materials such as boron or carbon fiber and VP props are permitted. Mylar covering is normally used. Biplanes are not allowed (UK rules).

It has proved an excellent class for beginners, perhaps better than EZB or Limited Pennyplane because it is robust yet slow flying. This is due to the big area and low rubber weight. On the other hand, there is plenty of design freedom and challenge for experts because there are few restrictions and VP props are permitted. It points people at F1D proper because the general design and flight characteristics are so similar.

Perhaps some may note that a Limited Pennyplane flying with a 1.5 gram motor would meet the rules for this class. This would still be a good starting point for beginners even though there are F1D Beginner plans with comprehensive instructions and kits available.

It has been suggested that North American modelers might find this class appealing, so I asked Larry Coslick if IN&V could publish a plan and run a demonstration event at USIC 1998 in Johnson City. Peter Keller of Switzerland has kindly provided a plan of his successful "Sunday Silence" design. This is a typical long (32") Swiss design with an abundance of boron and a VP prop. It has a best time of just under 15 min in a 40' ceiling. For high sites like Johnson City, it is doubtful that a VP prop will be much if any advantage because of the restricted rubber weight. The dimensions on the plan are in millimeters. American builders might prefer to use a tungsten-braced stick and a typical Open Pennyplane (no boron) structure with a fixed pitch prop. The wing and tail spars use 7-8lb wood, prop spars and wing posts 8-10lb and the rest 5-6lb. Typical component size weights are 0.9g, wing 0.9g, tailplane + tailboom 0.55g, prop 0.55g. Motors are usually 14-15" long x 0.070" strip.

There are moves afoot to have F1D Beginner recognized as a full FAI class (probably F1M), which opens up the possibility of officially recognized international events and records.

KIDS AND THEIR PLANES

By Larry Coslick

Gene Joshu, Roy White and myself had the privilege of going to Smyrna, Tennessee to help the Kid's Flying Aces Club. This past winter they built eleven limited Penny Planes and the group leader, Tim Lavender, wanted us to come to Smyrna and help trim the models. The group will fly them at the 98 USIC.

You have to see their operation to appreciate what Tim and Wayne Anderson are doing. It would be great if some professional photographer would put together a video of how they run this club and distribute it through the National Free Flight Society and the AMA. There is a lot to be learned here.

Tim is a minister in Smyrna and the club uses a spare room in his church for building their models. The nice part is that they have access to a 22-foot gym a few feet from their building room.

We started at 9AM Saturday morning with the idea to get all the models weighted and trimmed and have a contest in the PM. Tim only wanted three kids in the gym at a time, but that lasted about ten minutes. We were swamped with questions about using the torque meter and winding the motor. After the kids saw how good their models flew, we could not keep them off the floor.

The contest was a great success and there were a lot of flights over six minutes. The winning flight was around 6:56 and second place 6:53. We had to be out of the gym by 5:45 and a few kids were still flying as we were putting up the tables.

Indoor News and Views along with the St. Louis Thermaleers will sponsor four junior events at this years USIC. The events are limited Penny Plane, Bostonian, No-Cal Scale, and Coconut scale.

Tim also wanted us to convey his appreciation to Abram Van Dover and Gary Underwood for their help this past year.

Lew Gitlow, of Indoor Model Supply, sent us his new policies on balsa sales:
The requests for ALL OF ONE SIZE BALSA will be filled with an assortment of sheets close to the size and including the size ordered, in order to allow everyone to obtain first class material. I will try to make the weight, strength, and uniformity meet the demanding requirements of motor stick sheets, prop blades, and spars. EVERYONE WORLD WIDE WILL BE TREATED EQUALLY.
$75.00 minimum on all balsa orders.

F1D-B

F1D-B will be flown along with Limited Penny Plane at the 1998 USIC. This is not a scheduled event but token awards will be given to third place.

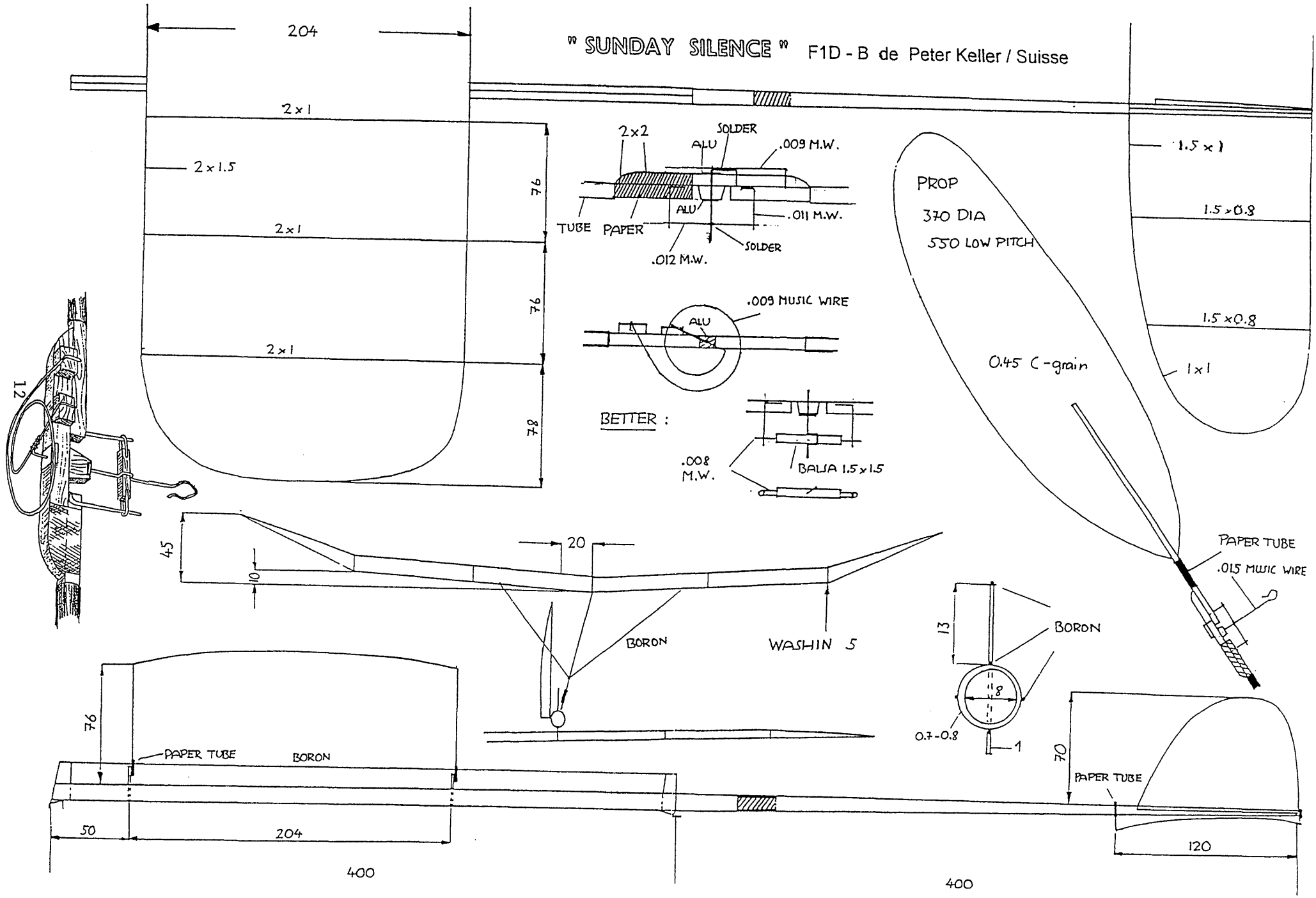
RULES:
- 18.1" span
- 1.5 gram maximum rubber weight
- Monoplanes only
- 3 grams minimum weight without rubber

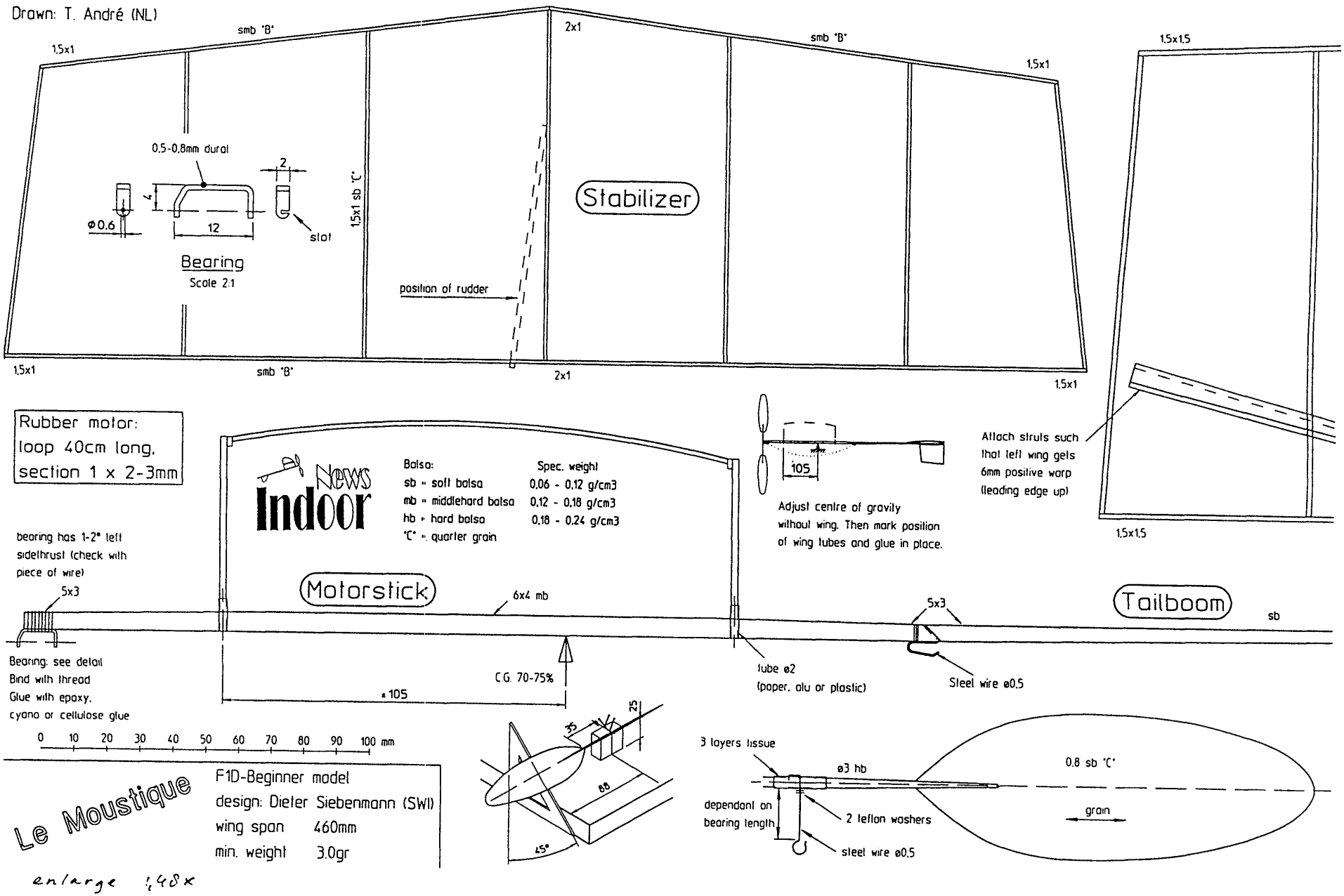
IMPORTANT NOTICE!
WE GOOFED BIGTIME!

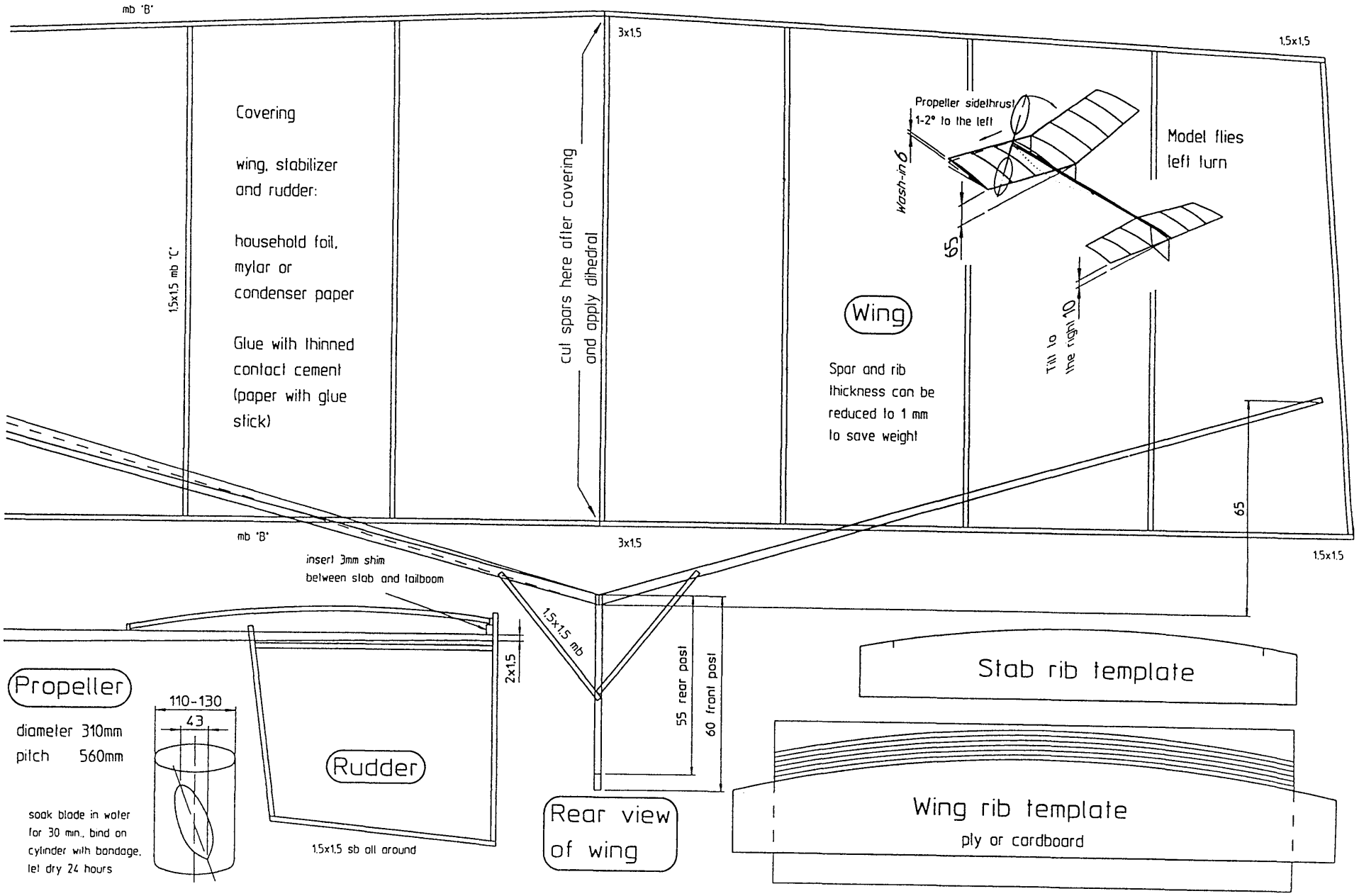
In the last issue, number 92, on page 36 we printed the 1997 USIC entry form instead of the 1998 form. We really hope that you caught the mistake.

" SUNDAY SILENCE "

F1D - B de Peter Keller / Suisse




Drawn: T. André (NL)
smb "B"
1,5x1
2x1
smb "B"
1,5x1
0,5-0,8mm dural
2
4
ø0,6
12
slot
Bearing
Scale 2:1
1,5x1 sb "C"
Stabilizer
position of rudder
1,5x1
smb "B"
2x1
1,5x1
1,5x1,5
1,5x1,5
Rubber motor:
loop 40cm long,
section 1 x 2-3mm
News
Indoor
Balsa:
sb = soft balsa
mb = middlehard balsa
hb = hard balsa
"C" = quarter grain
Spec. weight
0,06 - 0,12 g/cm3
0,12 - 0,18 g/cm3
0,18 - 0,24 g/cm3
105
Adjust centre of gravity
without wing. Then mark position
of wing tubes and glue in place.
Attach struts such
that left wing gets
6mm positive warp
(leading edge up)
bearing has 1-2° left
sidethrust (check with
piece of wire)
5x3
Motorstick
6x4 mb
5x3
Tailboom
sb
Bearing: see detail
Bind with thread
Glue with epoxy,
cyano or cellulose glue
C.G. 70-75%
± 105
tube ø2
(paper, alu or plastic)
Steel wire ø0,5
0 10 20 30 40 50 60 70 80 90 100 mm
35
25
80
45°
3 layers tissue
ø3 hb
0,8 sb "C"
dependant on
bearing length
2 teflon washers
steel wire ø0,5
grain
Le Moustique
F1D-Beginner model
design: Dieter Siebenmann (SWI)
wing span 460mm
min. weight 3.0gr
enlarge 148%


mb 'B'
3x1.5
1.5x1.5
Covering
wing, stabilizer and rudder:
household foil, mylar or condenser paper
Glue with thinned contact cement (paper with glue stick)
1.5x1.5 mb 'C'
cut spars here after covering and apply dihedral
Propeller sidethrust 1-2° to the left
wash-in 6
65
Till to the right 10
Model flies left turn
Wing
Spar and rib thickness can be reduced to 1 mm to save weight
65
mb 'B'
3x1.5
1.5x1.5
insert 3mm shim between stab and tailboom
1.5x1.5 mb
55 rear post
60 front post
2x1.5
Propeller
diameter 310mm
pitch 560mm
soak blade in water for 30 min., bind on cylinder with bandage, let dry 24 hours
110-130
43
Rudder
1.5x1.5 sb all around
Rear view of wing
Stab rib template
Wing rib template
ply or cardboard

MODEL NAME BLUE MOON BUILDER Mike Thomas, Canada

WING

Leading Edge Spar. Density 6.5# Grain C Length 16" Width .062" Height .062" Weight .1Gr. **Trailing Edge Spar.** Density 6.5# Grain C L. 16" H. .062" W. .062" Weight .1Gr. **Tips.** Density 6.5# Grain C Tip at L/E. Width .062" Height .062" Tip at T/E. Width .062" Height .062". Weight for 2 Tips. .04G **Ribs Standard.** Density 5.5# Grain C W. .062" H. .062" Weight Ea. .017G Wing Posts Density ---- Grain ---- L. ---- W. ----- H. --- Posts Round, Posts Rectangle. Weight for 2 finished posts. ------ Wing Weight Complete .6G Special Instructions Center spar 6.5# .062"X.062" Ribs glued to each side of spar. Wing covered with Jap Tissue. No dope, not water shrunk. Wing is glued to top of fuselage.1.49G comp.

FUSELAGE

Longerons. Density# 6.5 Grain C Width .050" Height .050". Cross-pieces. Density# 6.5 Width .050" Height .050". Grain C. Detail landing gear and nose block on plan sheet if possible. Total weight of fuselage dry. 1.16G Weight covered. 2G. Type covering used. Microfilm _____ Plastic _____. Tissue. Jap Landing gear .015 Wire 3" long, Wheels, 1/32" Sheet, Wheel hub 4 wraps of tissue around .015" wire. Lead ballast to obtain C.G. and min. weight.

STAB

Outline. Density 6.5# Grain C Leading Edge Center. W. .062" H. .062" Tip. W. .062" H. .062". Trailing Edge Center. W. .062" H. .062". Ribs. Density 5.5# Grain C W. .062: H. .062" Weight Ea. Rib. Varies Weight of Outline Dry. .32G Weight Covered .65G Special Instructions .062" Basswood peg extends .2", glued behind root L/E, plugs into rolled tissue

MODEL NAME BLUE MOON BUILDER Mike Thomas, Canada

FIN

Fin. Not Floating. Density 5.5# Grain C W All .062"

H. _____ Weight Dry ---- Weight Covered. ----

Special Instructions. Glued to top of fuselage.

Prop, Wood Blades - - - Fill in prop spar information

Blades. Density 4.5# Grain C Blades Area. Ea. ?

Blade Thickness .040" Weight for 2 Blades .6G

Give prop pitch at 45 degrees and one inch from tip. Pitch at 45 degree 11P Pitch 1 inch

From tip. 11P. If V / P, Low pitch _____ High pitch _____

If V / D, Diameter when extended _____ Diameter when folded. _____

Speical Instructions on prop construction Blades covered with Jap tissue and 3 coats of dope. Prop Spar, spruce, 1" on each side of 1/8" Aluminum hub. Prop shaft wire, .025"

RUBBER

Loop Length 40" Width .090" Rubber Vintage, Month and Year 8/93 Tan II. Weight of Loop. 5G. Turns 4500

Back off Turns. 0 Launch Torque in inch ounces. _____ Turns Left 150

Do you use O rings. Yes. Yes No. _____

TRIM

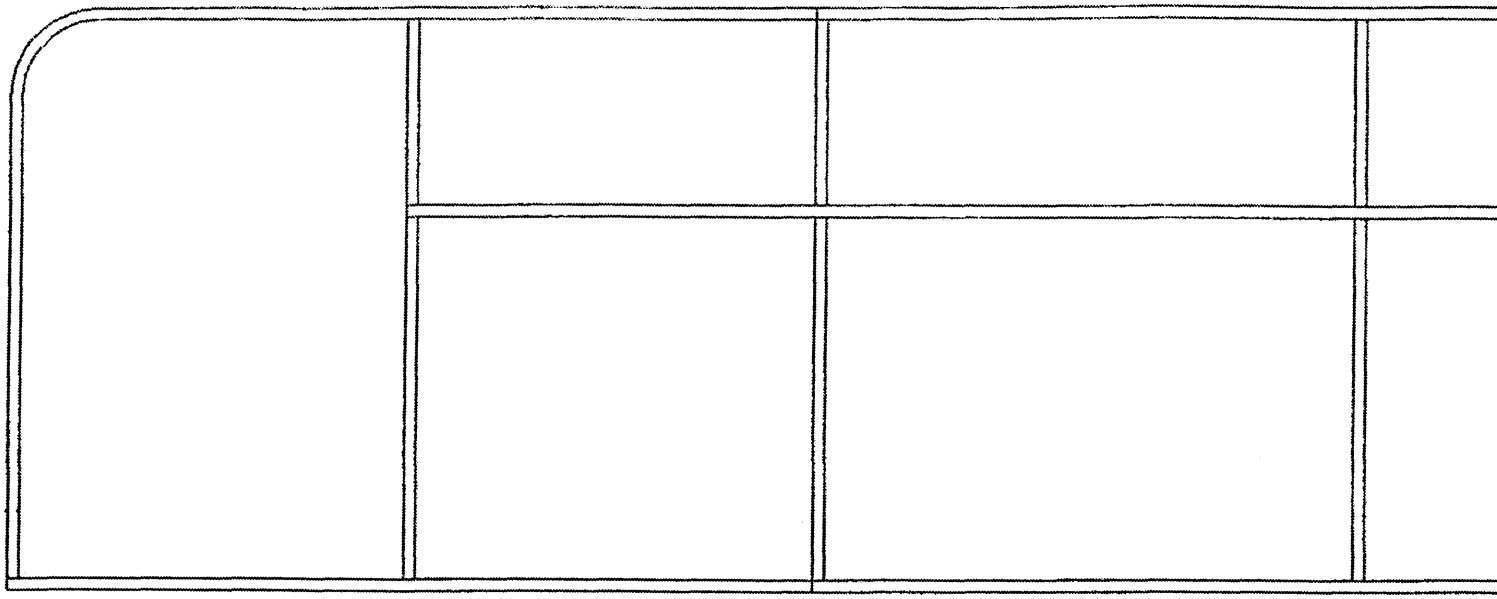
Wash In, Wing Left panel _____ Wash Out Left panel. 1/16"

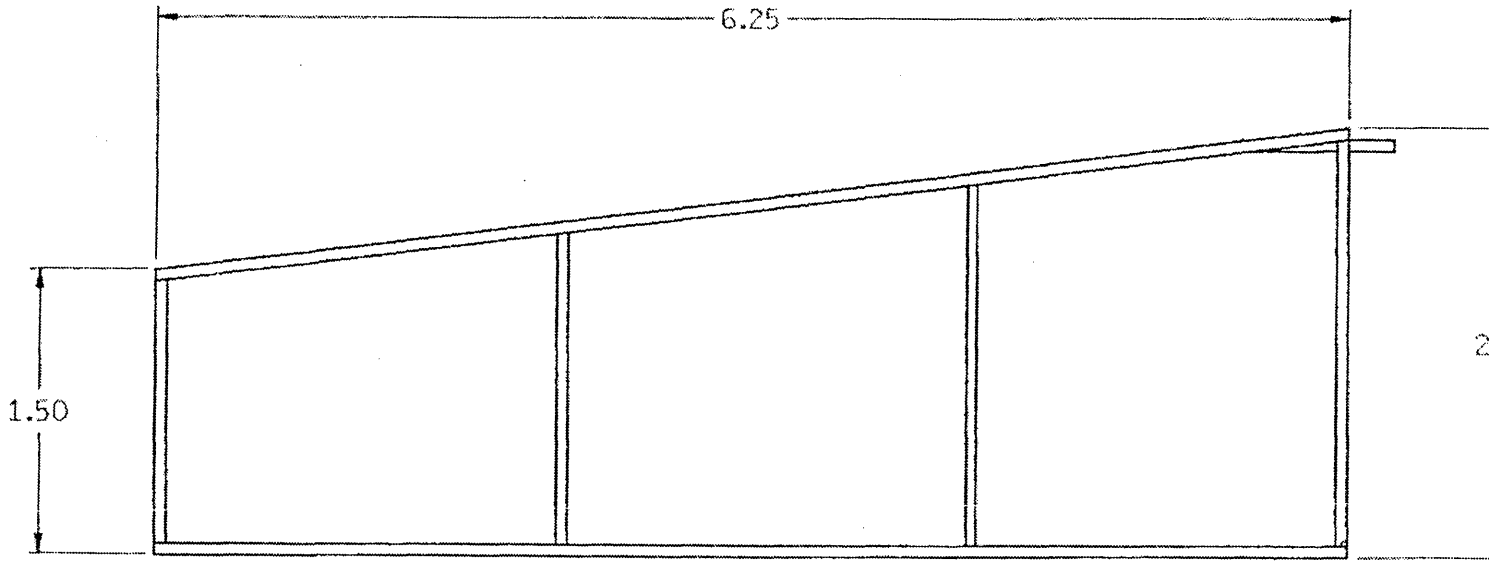
Wash Out, Right panel _____ Wash In, Right panel 1/16"

Wash In Stab. Yes _____ No No How Much _____

Down Thrust. 3 Degree Left Thrust. 2 Degree Special trim instructions.

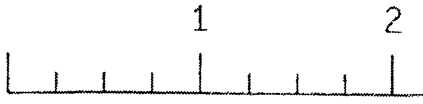
Right circle

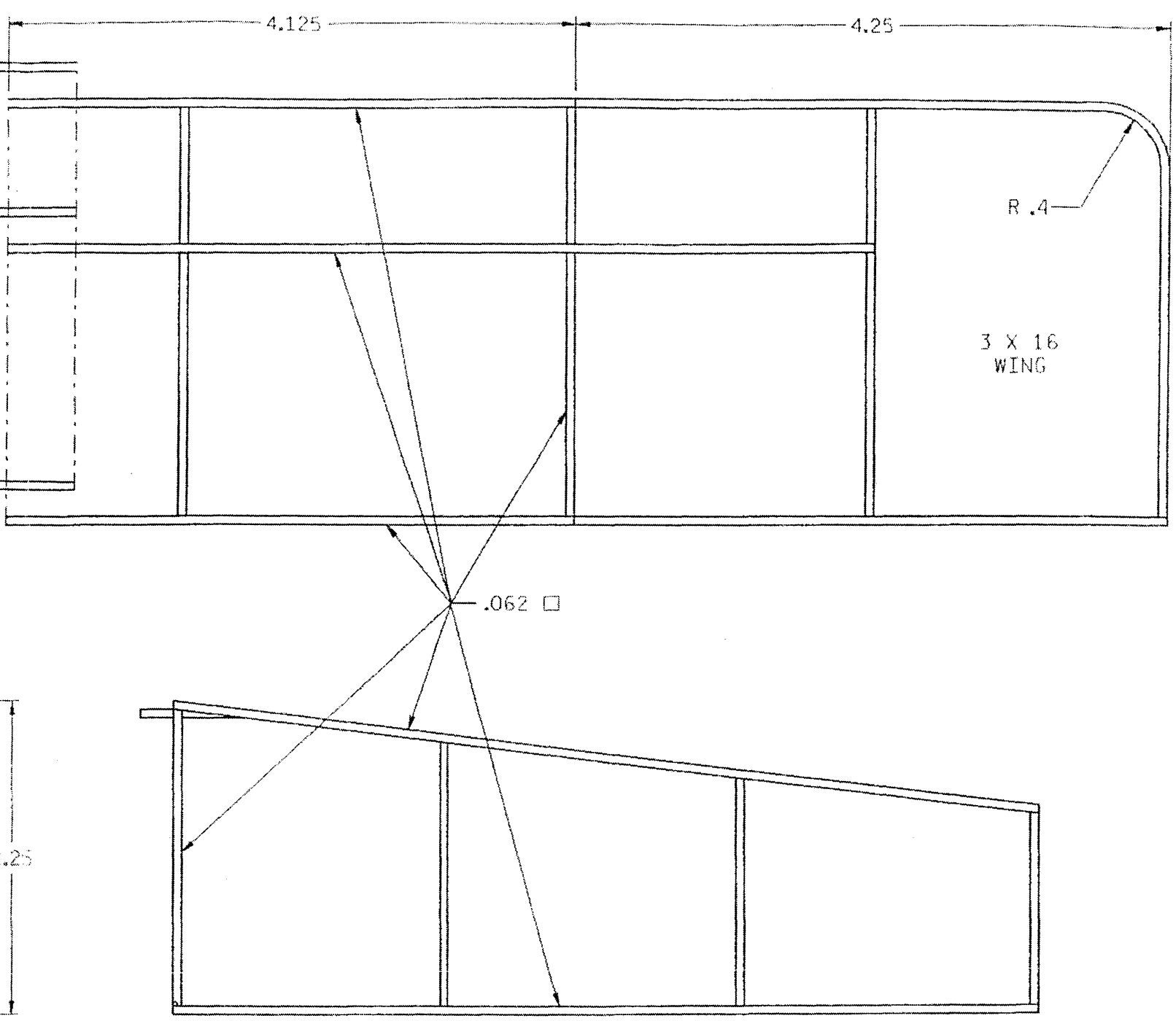




NOTES:

1. WING IS GLUED TO FUSELAGE.
2. WING SPAN = 16.0" MAXIMUM.
   DIHEDRAL APPROX 1.75"
3. NO STAB TILT.



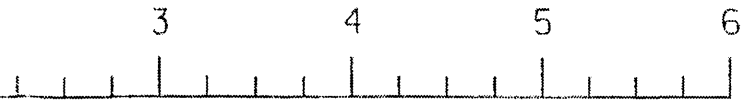


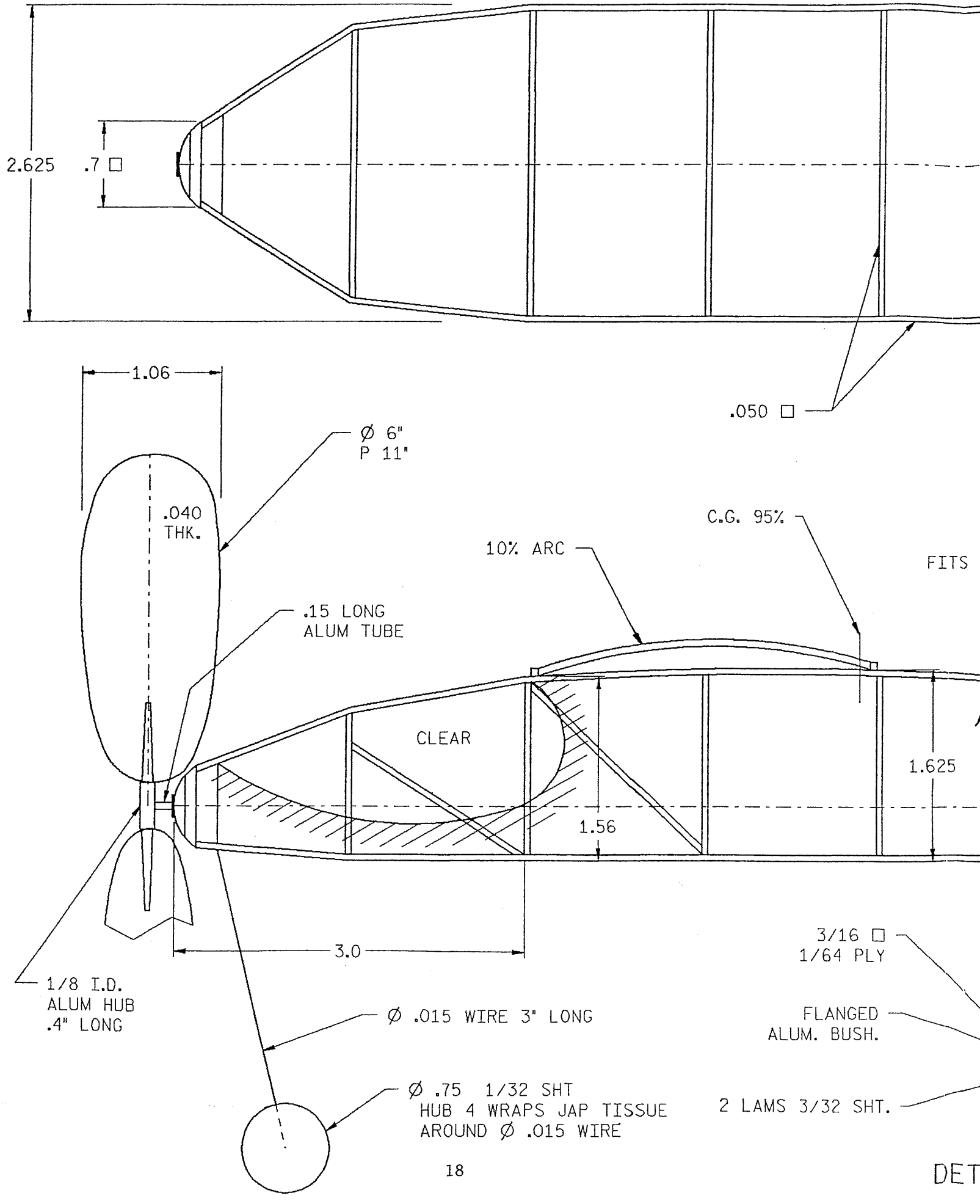
BEST FLIGHT 5:41 @ '97 U.S.I.C.
SECOND PLACE
RUBBER .09 X 40" LOOP TAN II
4500 TURNS

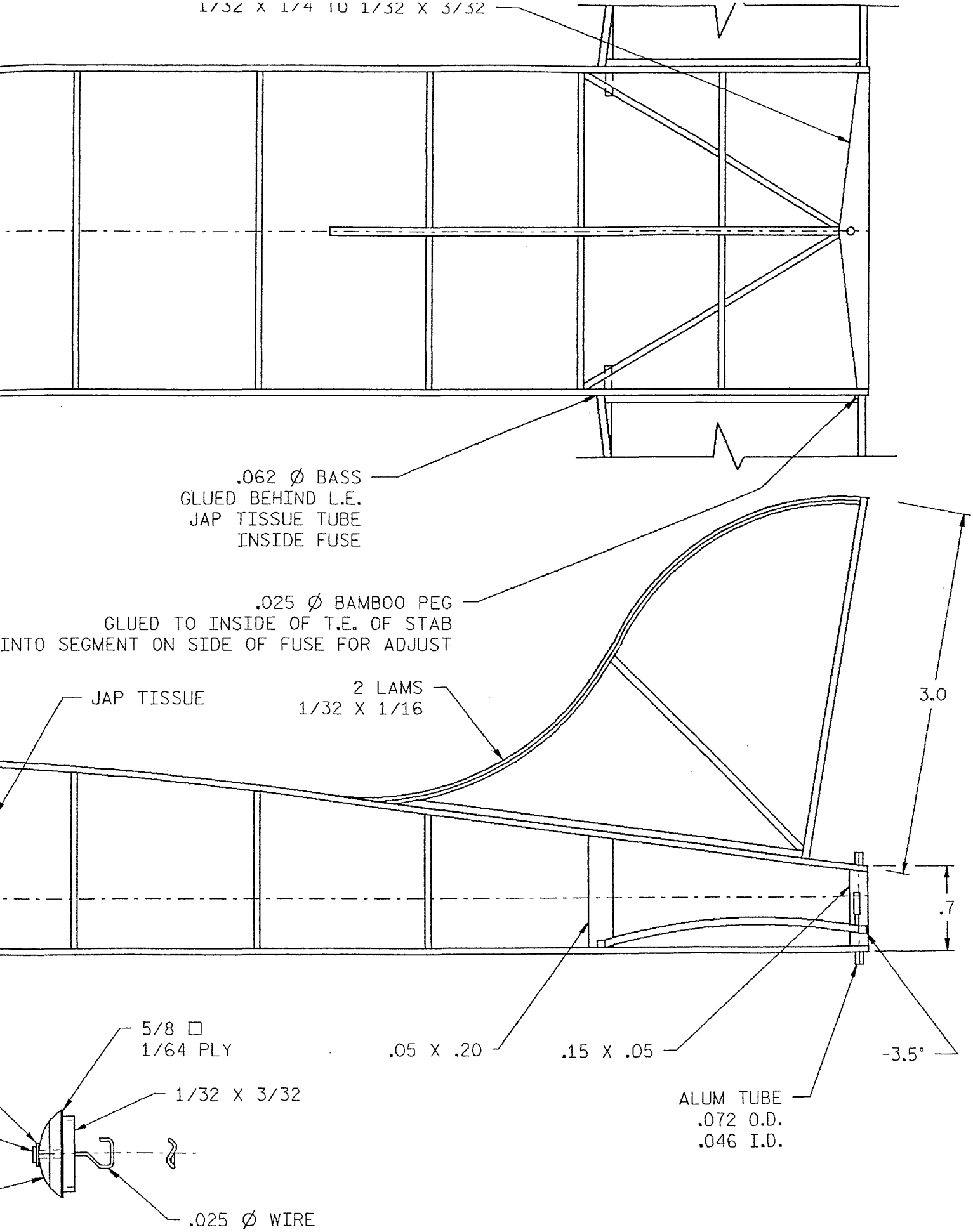
"BLUE MOON" BOSTONIAN

DESIGNED BY: MIKE THOMAS
-CANADA

CAD: M.PALRANG



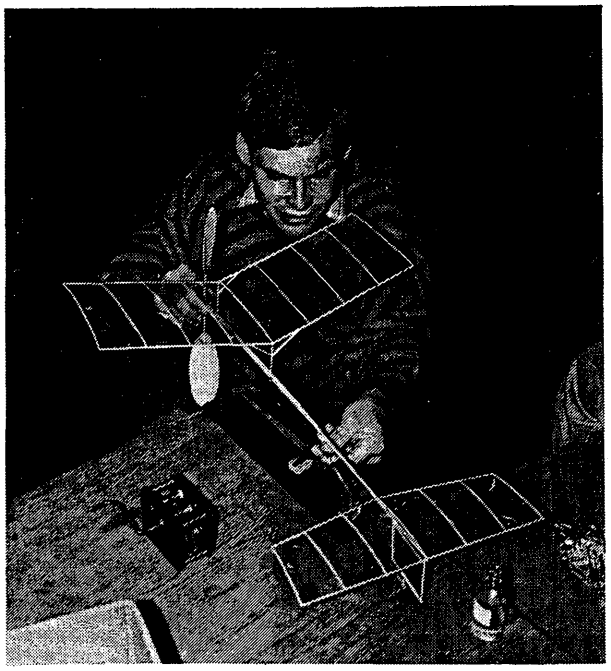

2.625
.7 □
.050 □
1.06
Ø 6"
P 11"
.040
THK.
.15 LONG
ALUM TUBE
10% ARC
C.G. 95%
FITS
CLEAR
1.625
1.56
3.0
1/8 I.D.
ALUM HUB
.4" LONG
Ø .015 WIRE 3" LONG
Ø .75 1/32 SHT
HUB 4 WRAPS JAP TISSUE
AROUND Ø .015 WIRE
3/16 □
1/64 PLY
FLANGED
ALUM. BUSH.
2 LAMS 3/32 SHT.



AIL- NOSE BLOCK

Begin with a Moustique!

Design: Dieter Siebenmann (SWI)
Building instruction:
Ebele Schouwstra and Thedo André (NL)

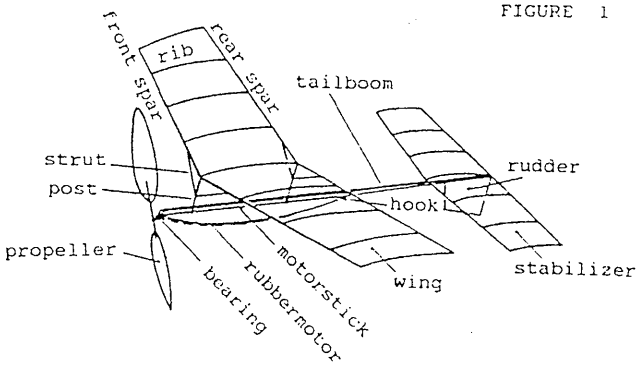


Choosing a Moustique as your first indoor model is a very good way to start. It is a fairly simple model, it will teach you all the basic techniques an indoor modeler needs and you can already fly it in competitions. It will do two to three minute flights in a gym hall. At competitions flights of more than six minutes are not uncommon. Though we tried to make this building instruction as clear and complete as we could, it will be likely that you will encounter some problems. If something is not clear or when you do not succeed in making something, then do not hesitate to ask an indoor flyer for help. They are very friendly people and will certainly help you. After all, they have been beginners too!

Preparation

When this is your first model airplane you will probably have to learn some new words and terms. Figure 1 shows the main parts of an indoor model. On the

FIGURE 1



drawing there will be more new words. Enlarge the drawing on a copy machine 1,41x.

We need a building board from soft board (in which you can easily stick pins in) of 22x60cm. Tape the plan onto the building board and cover it with clear household foil. This will prevent glue from sticking to the plan. Ensure that everything is flat and wrinkle-free. We need some other accessories. Cut straight strips from a sheet of 2mm balsa of the following dimensions: 10x250mm (4 each), 10x50mm (2 each) and 10x16mm (16 each). Glue four layers of 2mm on top of each other and construct the assembly block of figure 2. Try

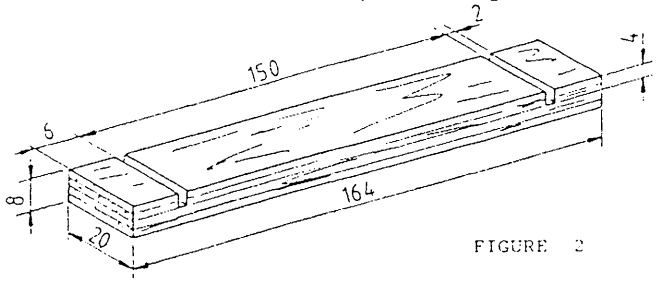
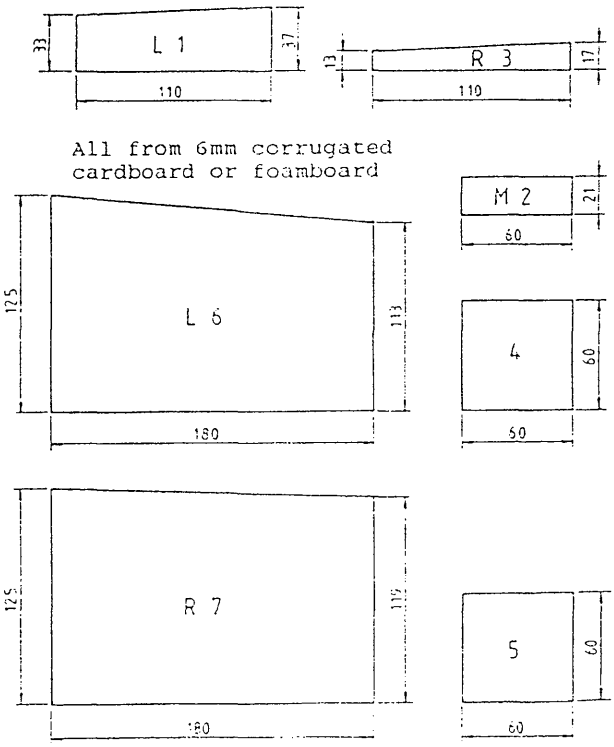


FIGURE 2

to get the sides and grooves as square as possible. Figure 3 shows several jigs which you can make from

FIGURE 3

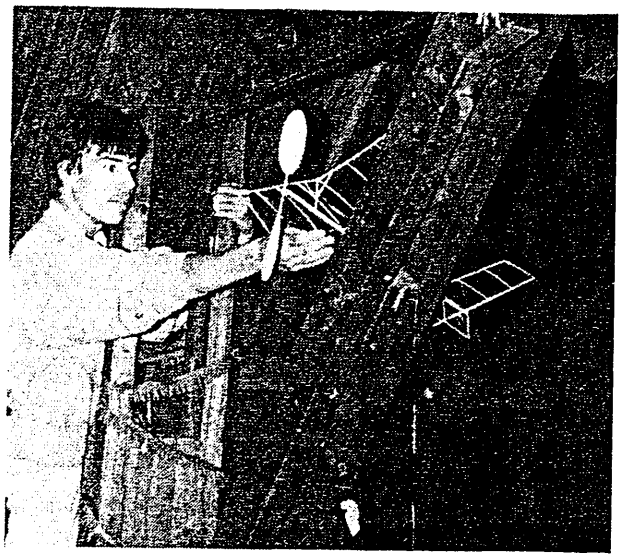


±6mm thick corrugated cardboard or foam board. As before: cut them as square as you can. Next we make the wing and stabilizer rib templates from thin ply or cardboard (see plan). Finish the curved sides as smooth as possible.

Two types of glue

We need two different kinds of glue. For joining wooden parts we use cellulose glue (like UHU-Hart). This glue has to be thinned down about 30% with thinner or acetone. The most handy way to apply the glue is by means of a syringe (needle size ±0,5mm). Stick a piece of wire in the needle to prevent it from clogging up. Indentify the wire with a piece of brightly coloured tape so that you find it quickly in the usual mess on your working table!

The other glue we need is contact cement for adhering the covering to the wing and tail frames. This glue also has to be diluted, ratio glue-thinner 1:2. Usually only thinners of the same brand as the glue will work successfully.



Required materials

For wing spars and wing ribs we need a sheet of 1,5mm middlehard balsa (weight of a 10x100cm sheet 18-27 gram). For tailplane and rudder 1mm is needed, weight of a sheet 10-18 gram. For the fuselage lighter balsa is required: a 4mm sheet of 40-50 gram or a 10x10x1000mm strip of 10-15 gram. In all cases the grain has to straight and regular. For the propellerblades we need a soft sheet of 1mm balsa, preferably quarter grain. This type of grain has more bending stiffness in a direction square to the grain. It is recognizable from its speckled look. We further need a piece of ϕ0,4 or 0,5mm steel wire for the propeller shaft and rear motorhook, a piece of 0,5-0,8mm hard aluminium (f.i. from a beer can) for the propeller bearing (bearings are also commercially available) and a piece of ϕ2mm I.D. aluminium or plastic tubing for the wing sockets. Wing socket tubes can be made yourselves. This is done by rolling a piece of tissue paper over a piece of ϕ2mm O.D. wire, f.i. a drill end, and impregnating this with cement or dope (three windings is sufficient). Pull off the tube before it begins sticking to the wire! For the wing covering we could use lightweight tissue, but only if we cannot obtain one of the many types of lightweight plastic foils that are available. These are called mylar, ultrafilm, microlite, polymicro and the like, and come in weights ranging from 7 to 1,25 grams/m^2. We further need teflon washers for the propeller bearing and of course rubber to fly on. Addresses of some suppliers are given at the end of the article.

Building wing and tail frames

We start by cutting the ribs and spars. For cutting we preferably use a razor blade. A thicker blade will distort the tiny strips we cut. Cover the other side of the blade that is not used for cutting with a piece of tape or break the blade overlength into two pieces. The ribs are cut in 1,5mm wide strips along the rib template. Make several extra for reserve. The spars are cut along a steel ruler. Cut them 10 to 20mm overlength. Note that the spars of the left wing are longer than of the right one!

We start by building the stabilizer. Rub the edges of the four longest assembly strips with a candle wax. This prevents glue from sticking to it. Pin the strips on the building board along the **outside** of the stabilizer outline (figure 4). Do not cut the strips to length. We need

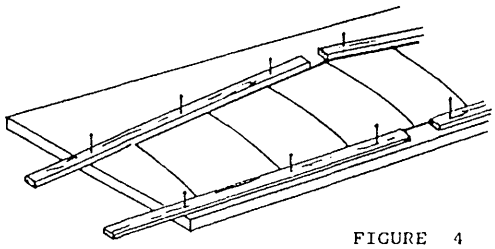


FIGURE 4

them for the wing also. Position the stabilizer spars along the strips and clamp them against it with the small 10x16mm pieces of balsa (figure 5). The spars rest on the building board with their small side, with the thin

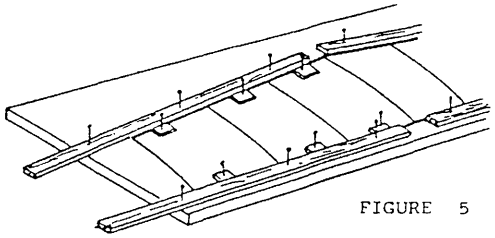


FIGURE 5

tapered ends towards the tip of the stabilizer. Never stick a pin through the spar!

The spars have to be glued together in the middle. Glueing is **always** done in the following manner, called "double glueing". Coat each surface with a thin layer of glue, wait a few seconds, apply glue to one of the surfaces and then join the pieces. This gives the strongest bonds. So for glueing the spars we have to remove them from the building board (setting them up was a useful exercise). Coat the end of one spar and replace it between the clamps, coat the end of the other spar, wait a few seconds, coat again, replace and press the spar against the other and reposition the clamps.

Take one of the ribs and hold it in its position over the plan. Carefully mark both ends to the correct length and cut off. The rib should fit in between the spars such that it is not under any bending stress, but still stays upright in position. Now prepare the next rib. If you cut one too short accidentally, do not worry. It can be used at a

position closer towards the tip. When all ribs fit accurately they can be glued. Again: doubly glued. Avoid big blobs of glue.

Leave the stabilizer to dry for half an hour, remove the clamping blocks and carefully lift the frame from the board. If it is stuck to the building board at some place, then loosen it by running a pin underneath. Cut off the extending ends of the spars. Inspect every glue joint closely. Add glue when necessary and remove excess glue with a razor blade. A careful and experienced builder will seldomly have to do this!

The rudder is assembled in the same way as the stabilizer. Position the strips on the board, cut to length, remove, glue and reapply. Note that one end of the sticks is not cut off (figure 6).

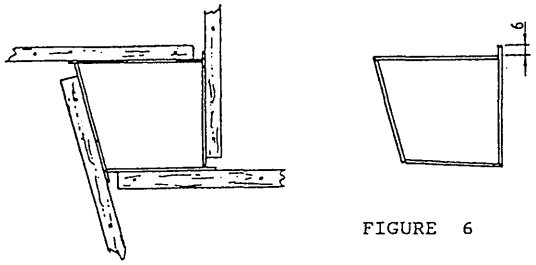


FIGURE 6

The procedure for building the wing is the same as for the stabilizer. Again note the correct position of the spars. The left wing is intentionally longer than the right wing. The middle rib is glued just left of the center line. You may have noted that the wing tips will be raised to a V-shape. We will do this after covering the wing. So the wing halves are joined in the middle temporarily.

Fuselage

The wood for the fuselage has to be of very good quality. Straight grain and no weak, hard or brittle spots. The motorstick can be tapered towards the ends from 6x4 to 5x3 mm to save some weight. Do the sanding in one direction only. A to-and-fro movement may easily break your carefully selected piece of wood.

For joining the motorstick and tailboom we need the large assembly block. Put cellotape over one of the small sides. Do not fold over the unsticked part, it may be cutted off (figure 7). Pin the block on the building

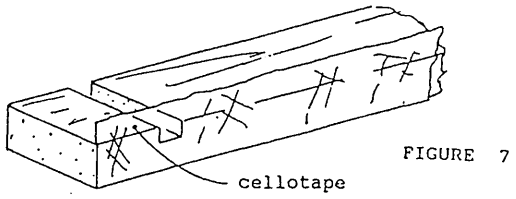


FIGURE 7

board along the top side of the fuselage at the stick-to-boom joint. Position motorstick and tailboom on the plan and check whether the joining faces fit accurately (figure 8). Take time to make this fit as good as you

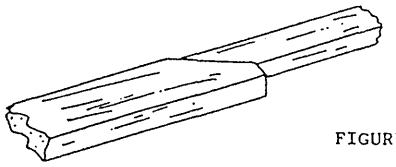


FIGURE 8

can. This joint is a vital one! Glue the pieces together (doubly glued!) and clamp them between the small balsa blocks.

When the glue has dried remove the fuselage from the building board and lay it upside down. Prick a hole with a pin between the motorstick and the tailboom along the glue joint for the rear motor hook. Put glue onto the hook and insert it into the hole. Lay a half knot in a piece of thread, slide the knot over the hook, pull tight and glue each end of the thread downwards along the sides of the motorstick (figure 9). Add a couple of

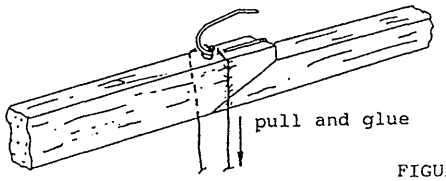


FIGURE 9

winds after drying, put on extra glue and cut the ends off after drying.

The propeller bearing is tack-glued with cellulose glue. With a piece of wire we adjust the bearing such that it is positioned with 1 to 2° of side-thrust to the left. That is to the **right** when viewed from the bottom as in figure 10! Let the glue dry thoroughly. It is then secured with

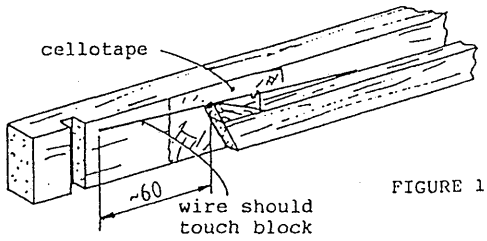


FIGURE 10

thread in the same manner as the rear hook, add several extra winds at the front and the rear of the bearing and glue with a generous amount of glue. You can also use instant glue or epoxy for this purpose. The last thing to add is the little vertical piece of balsa at the end of the tailboom. This piece raises the trailing edge of the stabilizer a little. Practice has shown that the tailboom usually tends to droop downwards instead of upwards. The wing sockets are added later.

Propeller

The propellerspar is sanded from middlehard balsa, 12cm long and tapered from ϕ3 to ϕ2mm towards the ends. The center section is reinforced with a few windings of tissue paper glued onto it. Next the propellerhook is bent and glued squarely in the spar. First bend the rounded hook end, prick a hole fore and aft through the tissue with a pin, push the hook through and bend the end squarely twice. Pull the hook backwards so that the rearward bent wire end sticks into the spar. Check alignment carefully and secure the hook with glue on the front and rear side.

The outline of the propellerblades is transfered to the balsa with carbon paper. It is perhaps better to make a cardboard or ply template of the blade shape and cut the blades along this template. This assures that both blades will be of the same shape. The blade can be sanded thinner towards the edges. Forming the blades into the correct pitch and camber is done in a simple way. For this we need a cilindrical shape, f.i. a paint tin, with a diameter of ±12cm. The blades are wetted in warm water for half an hour. They are then strapped to the cilinder with bandage under an angle as indicated on the plan. By putting both blades on top of each other they will get exactly the same twist. Be sure you have got the direction of the angle right, the propeller will turn to the right (when viewed in flying direction). Let dry thoroughly, a day in the open or 15 minutes in an oven (be careful, lowest temperature setting and leave the lid open).

The blades have to be glued to the spar in the correct angle. For this we make a simple jig as in figure 11.

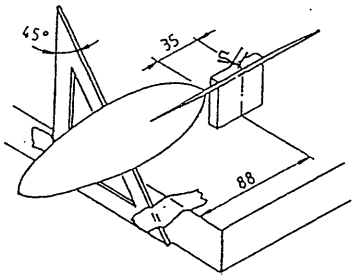


FIGURE 11

There is no need to cut a groove in the blade. You can glue it to the rear of the spar. Use a non-shrinking glue such as PVA or cellulose glue with some drops of castor oil in it. If you decide to make a groove then take care that the blade fits without distortion. On the other hand avoid any gaps. These take up too much glue which can lead to distortion of the blade. The last thing to do is to slide two teflon washers over the hook and finished is your propeller!

Covering

On an indoor model only the top side of the surfaces is covered. We start with the stabilizer and practice the procedure before we use any glue. Clean up your work table and spread out a sheet of newspaper. Onto this we lay the sheet of covering material. It can be spread easily by gently blowing it downwards. Pick up the stabilizer in the middle with one hand, curved side downwards, hold it about 2cm above the foil, check that there is at least 2cm of excess foil all around and drop the frame. It is of great importance that this procedure goes succesfully at the first try. Because we will use contact cement there is no second try! Practice until you feel confident.

Now for the wet run! Lay the stabilizer - curved side upwards - onto **another** sheet of newspaper. A glue drop on the covering newspaper sheet will lead to disaster! We can apply the glue with a little stick with a piece of velvet (figure 12). You can also use fine brush.

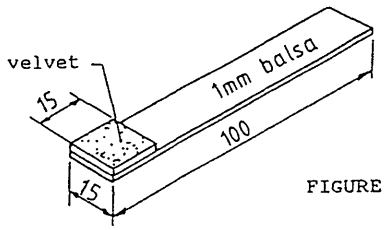
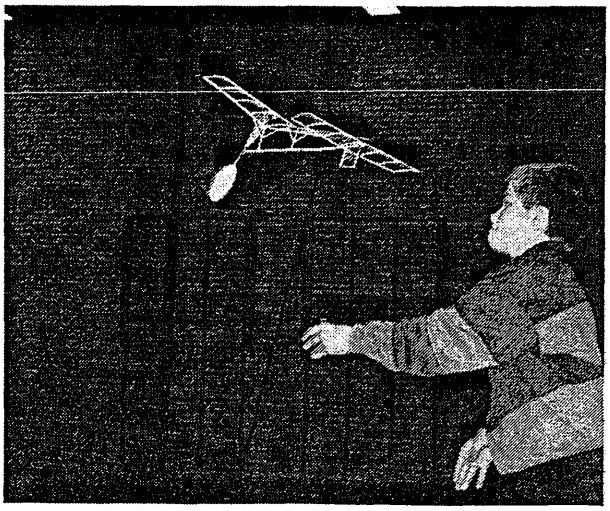


FIGURE 12

It is better to have the glue thinned down a bit too much than too little. You can always apply a second layer of glue. The glue is applied only to the top side of the spars and the end ribs. It is not really necessary to do the ribs as well. The glue may hardly be visible, but it should feel tacky when you touch it. If in doubt add a second run. Pick up the frame, turn it over, hold in position over the foil, check that there is excess foil all around, lower the frame and drop it from ±2cm height. Press the middle of the spar nearest to you down onto the film. Press down the left end of this spar, then the right end. Be sure to make vertical movements only. Tap the spar downwards at some places in between. Now press down the middle of the other spar and its ends. Because of the curvature of the ribs the fixed spar will lift a little from the board and the ribs will bend, but the structure is sufficiently flexible to do this without risk of breakage. Now the frame is fixed and there is no danger anymore of shifting. Next go all around the outline cm by cm and press down firmly.



With a bit of experience this method will result in relatively little wrinkling. Do not bother about wrinkles, they hardly have any effect on performance. When you use paper as a covering material these wrinkles are even beneficial. Changes in humidity will less likely cause

warping of the structure. Never dope a paper covered indoor model! Instead of contact cement you can also use thinned white glue or a glue stick (like Pritt). The wing and rudder are covered in the same way as the stabilizer.

Removing the excess foil

Take a new sharp razor blade. Lay the stabilizer on the building board, curved side upwards, with one spar just outside the edge of the board. Take one corner of the foil between thumb and forefinger, insert the razor blade and move it to the right (figure 13). It is as if you

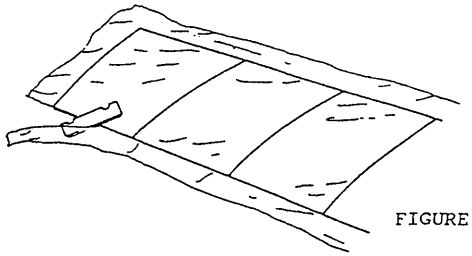


FIGURE 13

try to pull the framework off the table with your left hand and are resisting that with the knife. Go all along the outline of wing, stabilizer and rudder. Take care not to cut into the wood. Do not bother too much when you cannot remove the foil close enough to the spar.

Mounting the stabilizer

Assemble the cardboard jigs L1, M2 and R3 on the working table as in figure 14. The big assembly block is

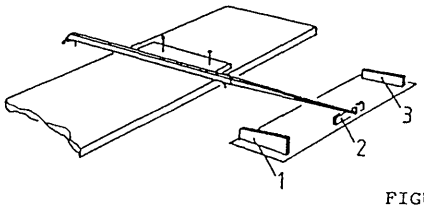


FIGURE 14

pinned to the building board. Place the fuselage against the block and clamp it between the little balsa blocks. Check that the fuselage is aligned squarely with regard to the stabilizer. If the end of the tailboom does not touch jig 2 put something under the jigs to raise them. Place the stabilizer in position (figure 15). When all is

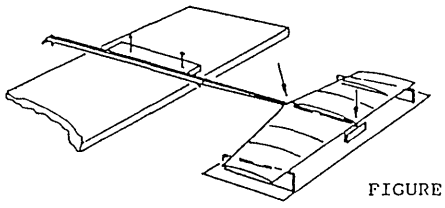


FIGURE 15

properly aligned glue the stabilizer at the indicated spots. Let it dry for at least 15 minutes. From now on you will have to handle your model with extra care: a sudden movement can easily lead to damage. The best way to hold the model is at the nose between thumb and forefinger.

Mounting the rudder

Lay the fuselage with stabilizer upside down. Hold the rudder in its correct position. Note that that the rear is offset to the left 8mm (figure 16). Put glue on the

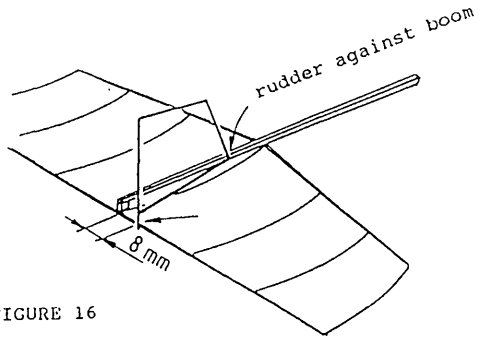
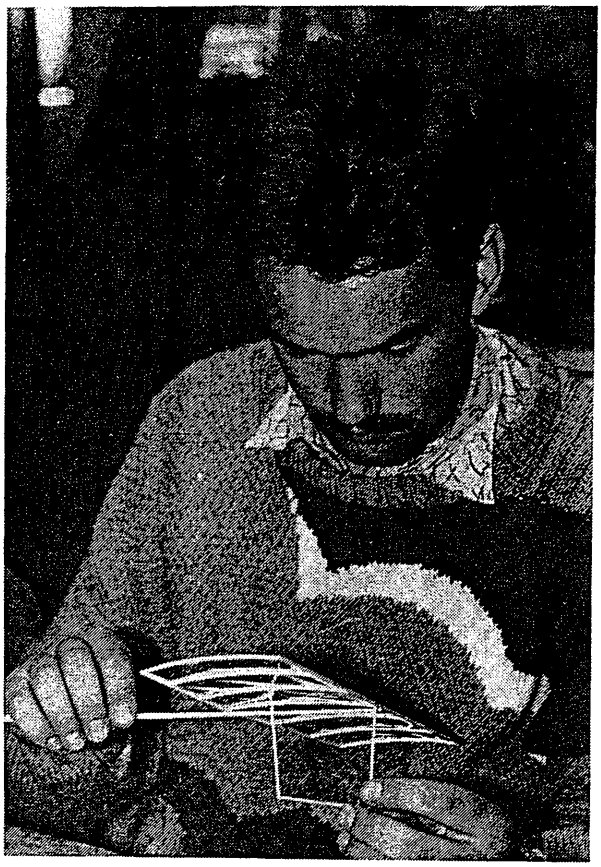


FIGURE 16



rudder as indicated, hold it in position and keep it there for a few seconds. It will stay upright. Leave it to dry further.

Tying the rubbermotor

First we exercise in making a half-knot (figure 17). Take both ends of the rubber (1), cross the ends (2), pass one end underneath the other (3) and pull lightly (4).

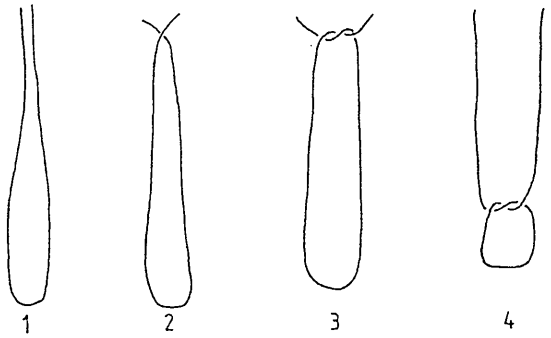


FIGURE 17

Now we make a complete motor (figure 18):

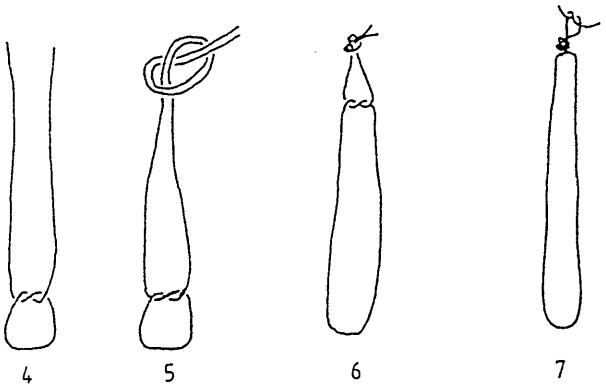
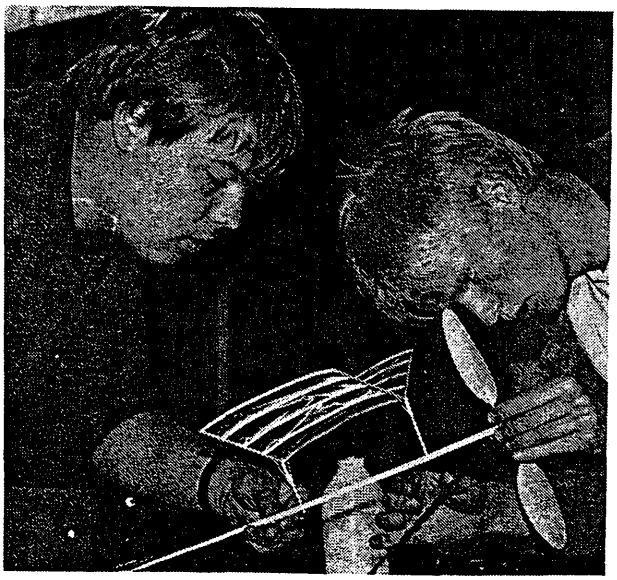


FIGURE 18

- Take a piece of rubber. A suitable size of rubbermotor for this model is a loop of 35cm length and a cross section of 1x2 to 3 mm.
- Slide two small O-rings over the strand and slide them towards the middle. These rings can be cut from ϕ3mm hard plastic tubing.
- Make a half-knot and slide it halfway downwards (4).
- Lay the ends on top of each other and tie a double knot (5). Do not yet pull the knot tight.
- Wet the rubber at the knot (f.i. with saliva). The moisture serves as a lubricant and prevents tearing of the rubber. Pull the knot tight and try to move the knot towards the end to within ±1cm. Pull it really tight!
- Now move the earlier made half-knot towards the double knot and pull tight (6). Remoisture if necessary.
- Slide one of the rings towards the knot and leave the other at the middle of the strand. Cut off the loose ends of rubber to about 5mm of the knot. The rubbermotor is ready.

It is possible that the knot gets loose when you tied it too loosely. When the motor is lubricated (later more about that) then remove the lubricant as far as possible, tie again with the same type knot but now an extra half-knot is put on top of that (7). This knot usually holds. If not then a small drop of instant glue between the loose ends will help.



Balancing

The wing posts are cut from relatively hard balsa. The ends are sanded round such that they fit precisely in the wing sockets. The fit must be such that no real force is required to insert them, but on the other hand they may not slide too easily. The front post is 60mm long, the rear 55mm.

The exact position of the sockets on the fuselage is determined as follows: hook the propeller into the bearing. Slide one of the rings of the rubbermotor over the propellerhook and the other ring over the rear hook. Support the motorstick with a little stick en shift the fuselage till it balances horizontally (figure 19).

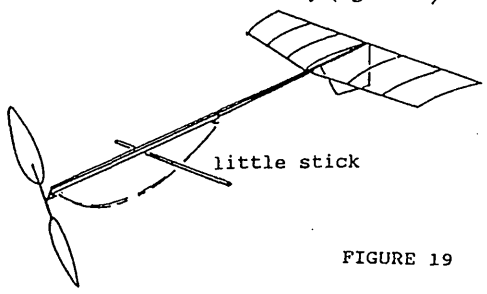


FIGURE 19

Mark this position on the motorstick with a fine pencil. Set other marks at 105mm forward and 45mm aft of this mark. These indicate the positions of the front and rear wing post.

Take the building board with the big assembly block and pin it down as indicated in figure 20. Lay the fuselage

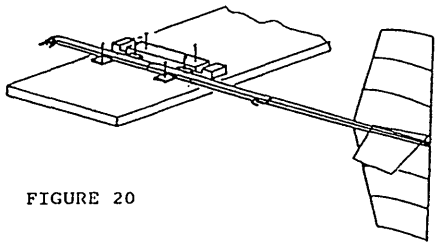


FIGURE 20

parallel to but not against the block. Leave about 1,5cm between so that the fuselage can be clamped with the little blocks. The lengthwise position should be such that the front and rear wing post marks align with the grooves in the assembly block. Slide a socket over each of the wing posts and lay them in the grooves (figure 21).

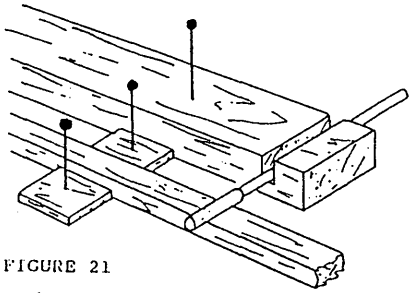


FIGURE 21

Let the sockets stick out over the motorstick equally at both sides. View the posts along the fuselage direction to be sure that they are aligned in the same plane. Glue the sockets to the motorstick sparely. Do not let any glue get onto the posts themselves! Let dry for 15 minutes. Add an extra layer of glue. Only after every-

thing has dried completely you can pull out the posts from the sockets.

Dihedral

The next step is to make dihedral in the wing and mount it to the wing posts. For this we have to set up a

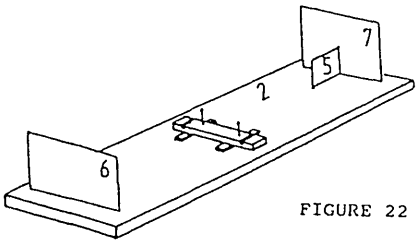


FIGURE 22

jig as in figure 22. Pin the cardboard jigs 4 and 5 vertically on the building board and jigs L6 and R7 against them with the 125mm side forward. Note that L6 and R7 are not exactly equal. The rear side of L6 is shorter than the rear side of R7. This guarantees that the wing halves will be glued together with the right warps built in. The left wing gets a positive warp of 6mm. Pin the large assembly block on the building board with two pieces of balsa underneath to raise it about 2mm.

Insert the longest wing post in the front wing socket and the shortest in the rear socket. Clamp the fuselage against the assembly block as in figure 23. The tail of

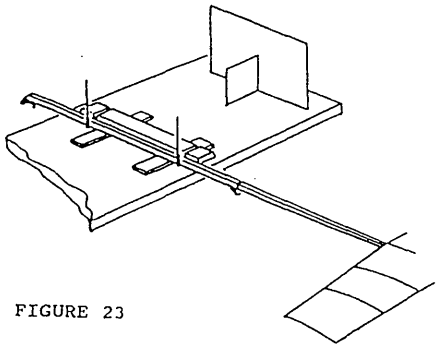


FIGURE 23

the model will stick out beside the table, so be careful not to hit it or the building board accidentally. Take the wing and lay it upside down. Make a half cut where you joined the wing spars. Gently break the joint further till you get the required dihedral amount. Handle the wing with care to prevent tearing of the covering and lay it on the jig (figure 24). Be sure that the leading edge is

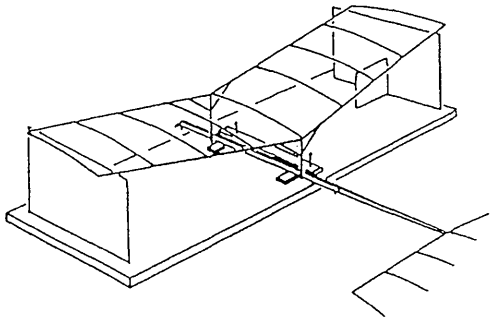


FIGURE 24

forward. The left wing is longer than the right. Position the wing break on top of or just between the wing posts and glue firmly.

You will notice that a big wrinkle has developed in the middle of the wing. It may not look nice but it will not influence the flying capabilities of your model. Add the four struts and let dry for half an hour. Remove the model from the jig and admire your model for a moment. It is finished!

Accessories

Find a box in which you can store and carry your model. The dimensions should be 56x34x14cm minimum. Construct the flaps of the box such that they cannot fall into the box and damage your model (figure 25). The fuselage is fixed with the motorstick slid into two foam rubber

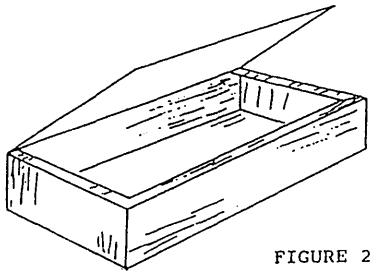


FIGURE 25

blocks. Cut a slit in each block and glue to the bottom of the box. The wing is mounted in the same way as it is fixed to the fuselage. Glue wing socket tubes to a piece of balsa and glue this in the box. Also in this case the sockets have to be aligned properly to prevent warps from developing in the wing.

For winding the rubber motor we need a winder with a gear ratio of about 1:10. You can make one yourselves from an old hand drill, alarm-clock or Meccano gears. They are also commercially available.

Flying

For our first trim flight we need a draft-free space with a floor space of 10x10m minimum (a gym hall, cantine, hangar, church). Because an indoor model allways flies powered by its propeller and not as a glider we will trim it directly as a powered airplane. Remember that the safest way to hold your model is at the nose between thumb and forefinger. This way you also hold the propeller. Force yourself to slow down, make gentle movements. When you run with the model in your hand all that will be left is the motorstick and remnants of wing and tail will flutter behind you.

Insert the propeller into the bearing and attach the rubber motor (knot at the rear!). Check that:

1. the longest wing post sits in the front socket.
2. the underside of each wing post is exactly equal with the underside of the socket.
3. the left wing has the correct positive warp and the right wing is flat (figure 26).

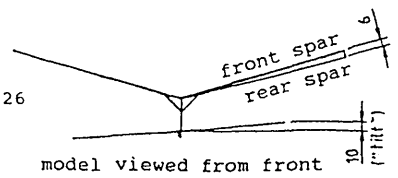
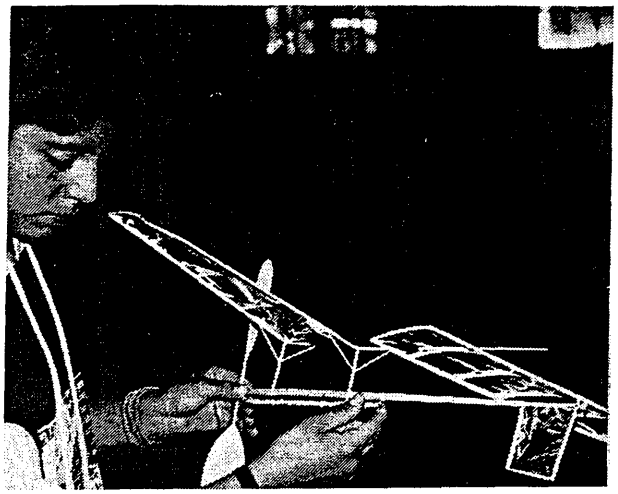


FIGURE 26

4. the stabilizer is flat.
5. the stabilizer is tilted to the right (figure 26).
6. the rudder is flat.
Small deviations are acceptable.



Take the model at the nose with your left hand and turn the propeller with your right hand 200 turns to the right. Now switch over the model such that you hold it with your left hand from the front at the bearing also keeping the propeller from rotating. Take the model with your right hand at the motorstick under the wing and release the propeller. Let the propeller turn for a few seconds and release the model with a gentle movement. Do not throw it! The model will turn to the left if everything is right. Do not panic when it hits the wall. Just let it happen and pick it up when it has slid down. Also when it risks to collide with a person say to him to stand still, freeze and let the model hit and slide down. The model flies so slowly and is so flexible that hardly any damage will result.

The model should not dive nor climb. When it tries to climb you will notice that it looses velocity, stalls and dives to pick up speed again (figure 27). When it stalls

stalling FIGURE 27

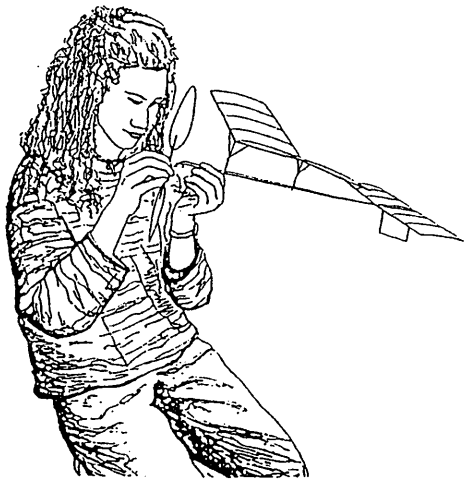
the front wing post has to be lowered in the socket. Do this in small steps of ±1mm. When it dives the rear post has to be lowered. When the model flies a neat and level left turn you can increase the number of turns. From now on we do not do this by hand any more as you can easily damage your model. We use the winder. The motor now always has to be lubricated with castor oil or another type of lubricant. Only then will the motor unwind smoothly and have a longer life. Hold the model between thumb and forefinger at the front so that you also hold the propeller. The rubber is hooked up at the propeller (knot at the rear!). Ask a friend to wind ±500 turns in the motor. Take of the motor from the winder grabbing it firmly just before the O-ring and hook it up to the rear hook. The winding is best done by stretching the rubber about 4 times its original length. In this position wind in about half the number of turns. The other turns are wound while gradually approaching the model till it matches the length of the motorstick. With this procedure, which can be refined a lot, you will get much more turns in the motor and it will last longer!

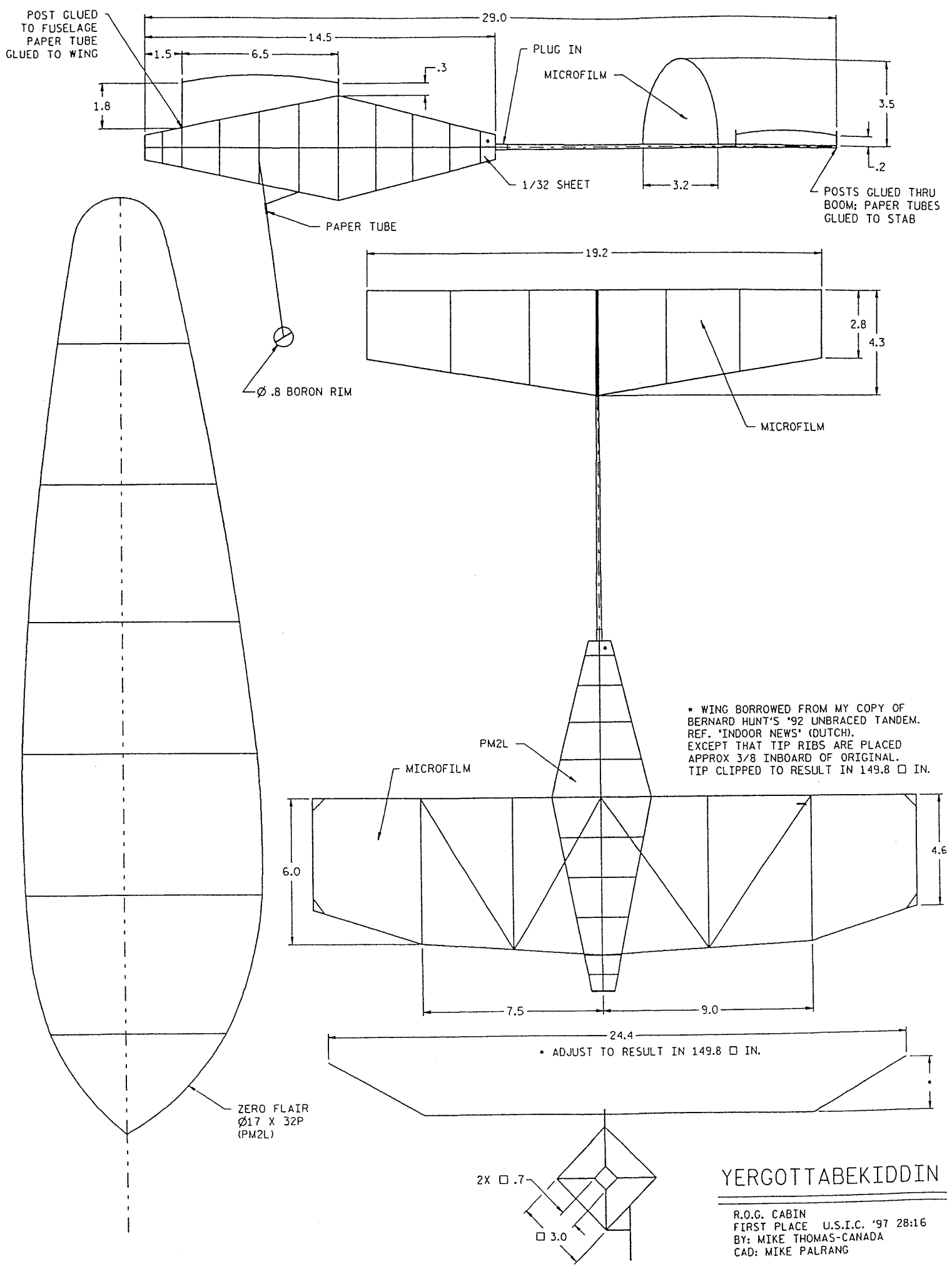
When the model flies level cut off the end of the wing post that extends below the wing socket. This ensures that you will allways mount the wing onto the fuselage with the correct incidence angle. Allways slide the wing posts into the sockets till they are aligned with the underside of the sockets.

You can now further increase turns till the model approaches the ceiling. When the ceiling is flat and smooth you can even allow it to hit the ceiling. When your winding technique has become optimum you can get up to 1600 turns into the motor. In large halls times of almost 10 minutes can be flown! But in a gym hall flights 5 minutes are very well possible. It is all a matter of clever experimenting with longer, shorter, thicker or thinner rubber, a larger propeller, more pitch, other blade shape or whatever design change you can think of!

How to continue?
That depends on you. Building or flying this model may not have been as satisfying as you expected or you have had some bad luck. We do not think that that is too bad. You have tried something and gained new experience. But you also may have become curious to what this model really can, and that is quite a bit. It requires further experimenting with rubber sizes. A lot can be told about winding technique. There are many, many other more challenging designs. Remember this: when you fail at something, or have something to ask, call or write one of the other indoor fliers. They will be glad to help you!

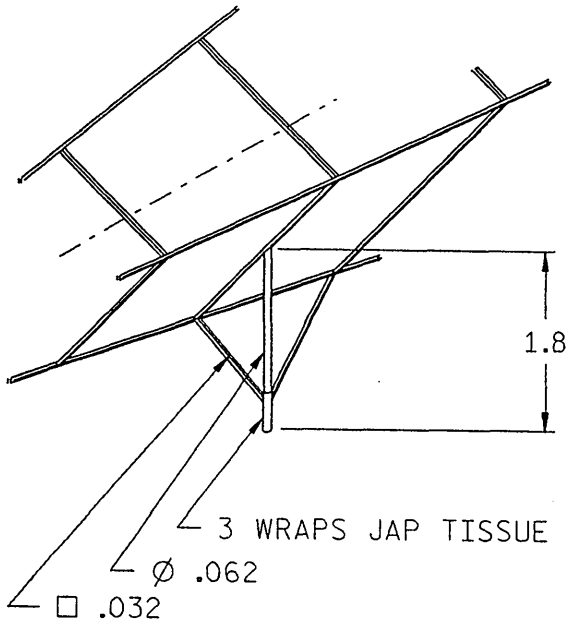
List of suppliers
Indoor Model Supply, Box 5311, Salem, OR 97304, U.S.A..
Micro-X, Box 1063, Lorain OH 44055, U.S.A..
SAMS Models, The Chapel, Sandon, Buntingford, Herts SG9 0QJ, England.
F1D Indoor Supplies, John Tipper, 23 Green Lane, Chichester, West Sussex, PO19 4NS, England.



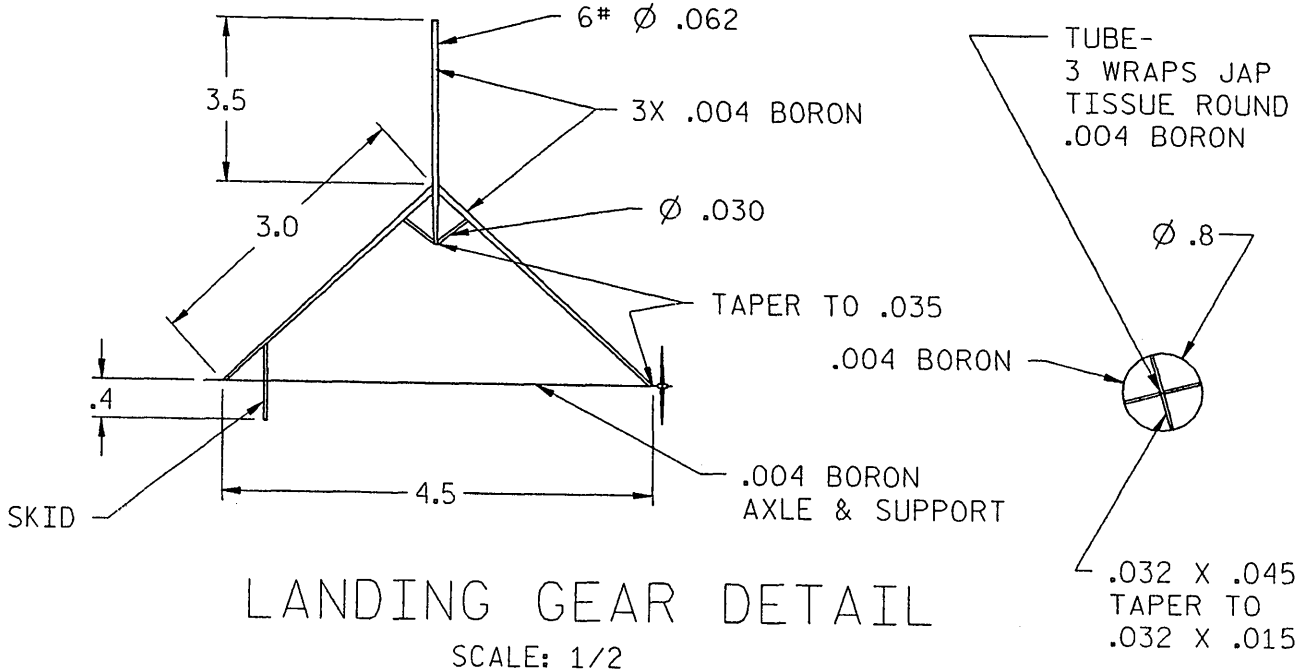


YERGOTTABEKIDDIN

R.O.G. CABIN
FIRST PLACE U.S.I.C. '97 28:16
BY: MIKE THOMAS-CANADA
CAD: MIKE PALRANG

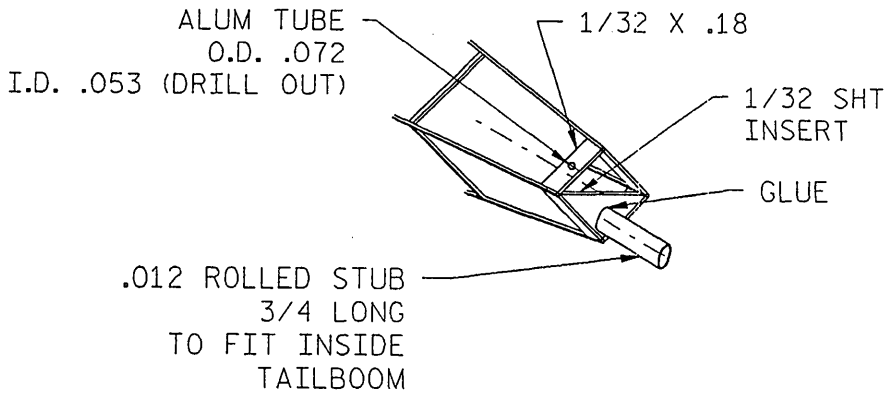


30 LANDING GEAR TO FUSELAGE DETAIL

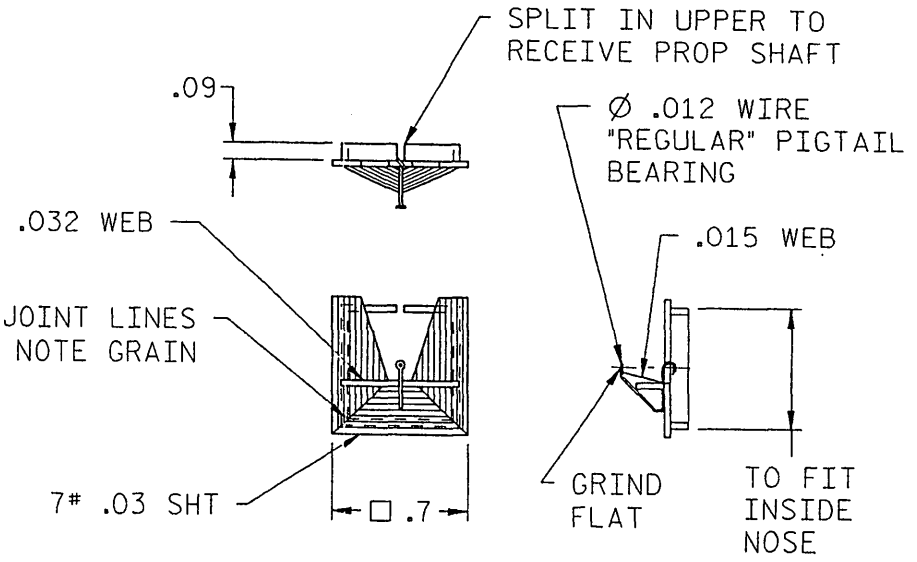


LANDING GEAR DETAIL

SCALE: 1/2



TAILBOOM JOINER DETAIL



NOSE BLOCK DETAIL

SCALE: FULL

Model Name CABIN ROG Builder Mike Thomas, Canada

STAB

Outline. Density 5.8# Grain C **Leading** Edge Center. W. .030"

H. .070" Tip. W. .030" H. .040". **Trailing** Edge Center. W. .030"

H. .070" Weight Leading Edge Spar ? Weight Trailing Edge Spar

? **Ribs**. Density 5.5# Grain C W. .020" H. .045"

Weight Ea. Rib. ? Weight of Outline Dry. .16G inc. paper tubes.

Weight Covered .17G Special Instructions Paper tubes, 2

turns around .03"X.06" Alm. form

Prop, Covered Blades

Prop Spar. Density 6.5# Grain C Spar Length 17"

Dimensions at prop shaft, W. .080"Dia H. _____ Dimensions at Tip. W. .030" Dia.

H. _____ Spar Weight. ? Prop Shaft Wire Size. .012"

If prop is V/P or V/D, detail mechanism on separate sheet of paper. Prop Outline, Wood. Density Boron

Grain _____ W. _____ H. _____ If Boron, Boron Size .004"

Ribs, Density 5.5# Grain C W .020H..030Prop dry. .14G

Prop

Grain C W. .020" H. .020" Prop weight dry. .14G

Covered .15G

RUBBER

Loop Length 18.5" Width .074" Rubber Vintage, Month and Year

8/93 Tan II. Weight of Loop. 1.84G. Turns 2300

Back off Turns. 10 Launch Torque in inch ounces. .5 Turns Left 40

Do you use O rings. Yes. / No. _____

TRIM

Wash In, Wing Left panel .25" Wash Out Left panel. ----

Wash Out, Right panel --- Wash In, Right panel .05"

Wash In Stab, Yes _____ No / How Much ---

Down Thrust. 1Degree Left Thrust. 2 Deg Special trim instructions.

MODEL NAME CABIN ROG BUILDER Mike Thomas, Canada

WING

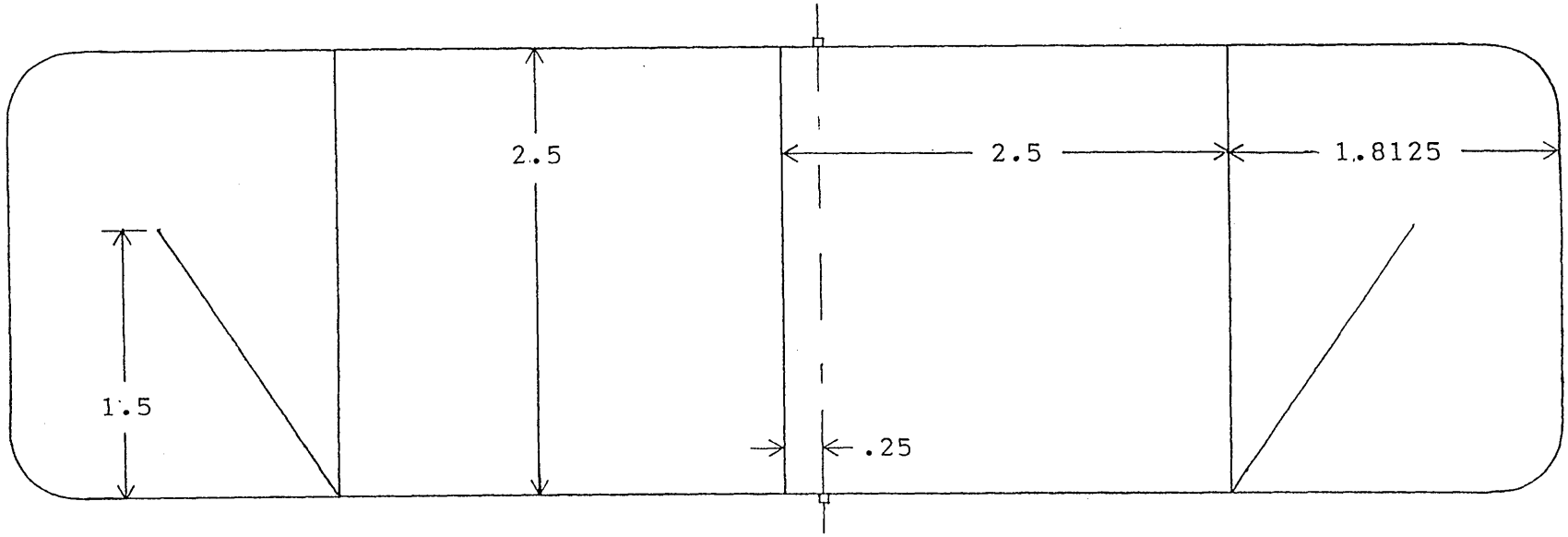
Leading Edge Spar. Density 5.5# Grain C Length See Dwg. Width .032" to .03"
Height .125-.05 Weight ? **Trailing Edge Spar.** Density 5.5# Grain C
L. See Dwg. H. .125-.05 W. .032- .03 Weight ? **Tips.** Density 5.5#
Grain C Tip at L/E. Width .03-.025 Height .05-.035 Tip at T/E. Width .03-.023
Height .05-.035 Weight for 2 Tips. ? **Ribs Standard.** Density 5#
Grain C W. .025" H. .065" Weight Ea. ?
Wing Posts Density 7# Grain C L. 1.8 Fwd. .03 Aft. W. .032" H. .1"
Posts Round, Posts Rectangle. Weight for 2 finished posts. ? Wing Weight Complete
.35G Special Instructions Unbraced wing, needs stiff wood
Dihedral ribs. .032x.065" Tip ribs, .032x.036" .020"
Sq. diagonal bracing at tip L/E & T/E.

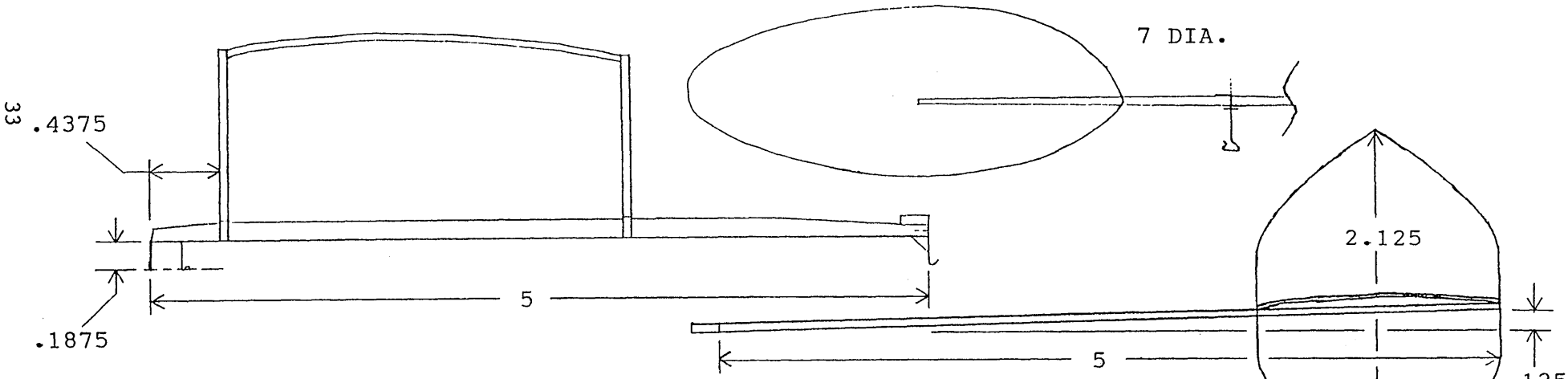
FUSELAGE

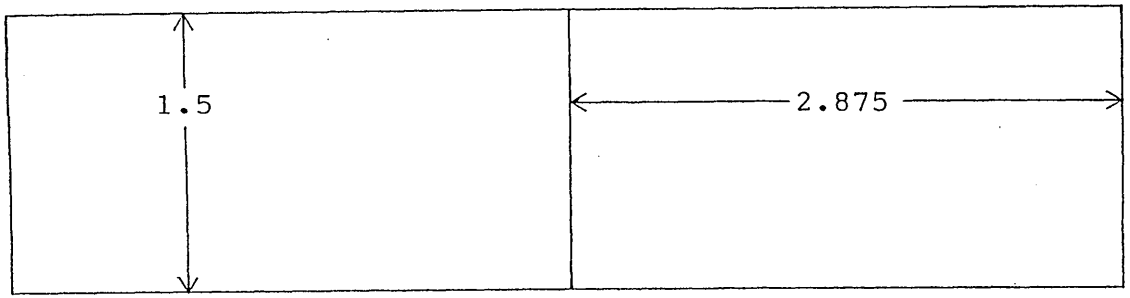
Longerons. Density# 6.3# Grain C Width .045"
Height .045". Cross-pieces. Density# 6 Width .030"
Height .040". Grain C. Detail landing gear and nose
block on plan sheet if possible. Total weight of fuselage
dry. .83G Weight covered. .95G. Type covering used.
Microfilm _____ Plastic PM 2.

Boom

Boom Rolled. Density 5# Grain C Sheet Weight .008 thick
Cut Weight _____ Width Front .2"Diam. Width Rear. .1" Diam.
Glued Weight _____ Boron, Yes, No. Boron Size _____ Boron Position
_____ Finished Weight. See spl. inst. Special Instructions
Boom weight includes fin and stab posts. .12G. Boom
plugs into tapered sleeve at rear of fuselage.







OPEN MINI-STICK
"LI'L TWO TIMER"
2nd 1997 USIC TIME 11:56
NICK WALTON FORT ATKINSON, WI.

MODEL NAME MINI-STICK BUILDER Nick Walton

STAB

Outline. Density 5 lb. Grain A Leading Edge Center, W. .03 H. .03 Tip. W. .03 H. .03 . Trailing Edge Center, W. .03 H. .03 . Ribs. Density 5 lb. Grain C W. .028 H. .03 Weight Ea. rib. - . Weight of Outline Dry. - Weight Covered. - . Special Instructions. Total Weight Of Stab, Fin And Boom = .003 oz.

WING

Leading Edge Spar. Density 5 lb. Grain A Length 5 Width .03 Height .04 Weight - . Trailing Edge Spar. Density 5 lb. Grain A L. 5 H. .04 W. .03 Weight - Tips. Density 5 lb. Grain A Tip at L/E. Width .03 Height .03 Tip at T/E. Width .03 Height .03 . Weight for 2 Tips. - Ribs Standard. Density 5 lb. Grain A W. .028 H. .04 Weight Ea. - . Ribs Compression. Density Grain Top of Rib. W. H. Bottom of Rib. W. H. Upright Weight Ea. . Wing Posts. Density 6 lb. Grain B L. 1.25 W. .053 H. .057 Wing Covered. Wing Weight Complete. .0039 oz Special Instructions Adhesive used for covering - Artists Matte Medium thinned with water

Boom Solid. Density 5 lb. Grain A Length 5.094 Front Width. .055 Front Height. .065 Center W. .053 Center H. .060 Rear W. .051 Rear H. .055 Cut Weight - Finished Weight. - . Special Instructions. Boom plugs in to tissue tube on top of Stick.

FIN

Fin, Not Floating. Density 5 lb. Grain A W. .03 H. .03 Weigt Dry. - Weight Covered. - .

MOTOR STICK SOLID

Density# 5 lb. Grain A Length 4.94 Front, Width .082

Height .095 Center, W. .084 H. .114 Rear, W. .066 H. .068

Cut weight - Finished Weight. -. Special Instructions

M/S complete with tubes, post,wire. Weight .003 oz..

PROP

Grain _____ W. _____ H. _____ Prop weight dry. _____

Covered _____

PROP, WOOD BLADES--- Fill in prop spar information

Blades. Density 5 lb. Grain C Blade Area, Ea. 2.3

Blade Thickness .016 Weight for 2 Blades - Give prop pitch at 45 degrees and one inch from tip. Pitch at 45 degree 16.8 Pitch 1 inch from tip. 11.4.

Special Instructions on prop construction Finished Weight .0052 Form on 2.125 Diameter Cylinder at 15°

RUBBER

Loop Length 12 Width .026 Rubber Vintage, Month and Year Late '96. Weight of Loop. _____. Turns Unknown

Back off Turns. _____ Launch Torque in inch ounces. .2

Turns Left. 20 Do you use O rings. Yes. _____ No. X

TRIM

Wash In, Wing Left panel .0625 Wash Out Left panel. 0

Wash Out, Right panel 0 Wash In, Right panel 0

Wash In Stab, Yes _____ No X How Much _____

Down Thrust. 0°. Left Thrust. 2° Special trim instructions. Add .0625+ Incidence to Wing, .125 in Boom and .125 Stab tilt

FORTY MINUTE CLUB

JANUARY 1998

NAME	COUNTRY	TIME	1*	2*	YEAR	SITE
BROWN, STEVE	USA	63:54	X		1996	SANTA ANA
RICHMOND, JIM	USA	56:35	X		1996	AKRON
RANDOLPH, BOB	USA	55:06	X		1993	SANTA ANA
BROWN, STEVE	USA	53:45		X	1997	SANTA ANA
ASLETT, BERNARD	UK	52:22	X		1983	CARDINGTON
UNDERWOOD, GARY	USA	51:58		X	1996	LAKEHURST
KOWALSKI, DICK	USA	50:41	X		1976	AKRON
DOIG, RICH	USA	50:41		X	1995	AKRON
BANKS, CEZAR	USA	49:50		X	1996	MOSCOW, IDAHO
RICHMOND, JIM	USA	49:44		X	1997	SANTA ANA
ROMAK, BUD	USA	49:35		X	1991	LAKEHURST
RANDOLPH, BOB	USA	49:31		X	1995	AKRON
BARR, LAURIE	UK	49:29		X	1996	CARDINGTON
HUNT, BERNARD	UK	49:07		X	1997	CARDINGTON
COSLICK, LARRY	USA	48:16		X	1997	SANTA ANA
SLUSARCZYK, DON	USA	48:10		X	1995	AKRON
BUTTY, RENE	SWI	48:01		X	1996	MOSCOW, IDAHO
KAGAN, JOHN	USA	47:58		X	1997	SANATA ANA
ROHRBAUGH, AL	USA	47:40	X		1997	AKRON
HARLAN, RAY	USA	47:13		X	1980	AKRON
ROBBINS, HERB	USA	46:41	X		1997	SANTA ANA
DOIG, RICH	USA	46:24	X		1983	AKRON
OTA, KENICHI	JPN	46:16		X	1996	MATUMOTO CITY
LOUCKA, LARRY	USA	46:14		X	1995	AKRON
CHILTON, STAN	USA	46:10		X	1994	AKRON
McGILLIVRAY, JACK	CAN	45:57		X	1996	MOSCOW, IDAHO
RODEMSKY, ERV	USA	45:50	X		1974	SANTA ANA
RIEKE, K. H.	GER	45:40	X		1962	CARDINGTON
MERKT, THOMAS	GER	45:27		X	1996	MOSCOW, IDAHO
GIBBS, BOB	USA	45:23		X	1995	SANTA ANA
REDLIN, CARL	USA	45:17	X		1962	CARDINGTON
ANDREWS, PETE	USA	44:59		X	1979	AKRON
MATHER, CLARENCE	USA	44:44	X		1974	SANTA ANA
ASLETT, BERNARD	UK	44:37		X	1985	CARDINGTON
DE BATTY, BOB	USA	44:35		X	1996	SANTA ANA
NICOARA, VASILE	ROM	44:30		X	1996	MOSCOW, IDAHO
HULBERT, BILL	USA	44:27		X	1994	AKRON
HACKLINGER, MAX	GER	44:20	X		1961	CARDINGTON
NORE, PENTTI	FIN	44:01		X	1986	CARDINGTON
ANDRE, THEDO	NED	44:01		X	1986	CARDINGTON
KOPECKY, ERNIE	USA	43:42	X		1963	SANTA ANA
ROBBINS, HERB	USA	43:39		X	1995	SANTA ANA
ORSOVAI, DEZSO	HUN	43:37		X	1986	CARDINGTON
KUJAWA, SYLWESTER	POL	43:35		X	1992	WROCLAW
MANGALEA, CORNELIU	ROM	43:30		X	1996	MOSCOW, IDAHO
CUMMINGS, FRANK	USA	43:28	X		1963	SANTA ANA
REE, ANDRAS	HUN	43:27		X	1992	DEBRECEN
ATWOOD, BILL	USA	43:17	X		1963	SANTA ANA
ENOMOTO, HIDEYO	JPN	43:02		X	1997	MATUMOTO CITY
THOMAS, MIKE	CAN	43:01		X	1996	MOSCOW, IDAHO
PLOTZKE, RON	USA	42:53	X		1969	LAKEHURST
FOSTER, JOE	USA	42:44		X	1987	SANTA ANA
SIEBENMANN, DIETER	SWI	42:33		X	1986	CARDINGTON
CAILLIAU, LARRY	USA	42:29		X	1985	AKRON
DOMINA, DAN	USA	42:25		X	1979	AKRON
CANNIZZO, SAL	USA	42:20		X	1983	LAKEHURST
PYMM, DAVE	UK	42:03		X	1986	CARDINGTON
ROMAK, BUD	USA	42:01	X		1965	MOFFETT NAS
OBARSKI, DICK	USA	41:30		X	1981	AKRON
FINCH, TOM	USA	41:27	X		1963	SANTA ANA
CHAMPINE, BOB	USA	41:23	X		1963	SANTA ANA
RODEMSKY, ERV	USA	41:23		X	1979	AKRON
STOLL, ED	USA	41:21	X		1963	SANTA ANA
HOFFMAN, EARL	USA	41:13		X	1987	SANTA ANA
MATHER, CLARENCE	USA	40:54		X	1974	SANTA ANA
GANSER, RON	USA	40:53	X		1996	AKRON
TIPPER, JOHN	UK	40:47		X	1996	MOSCOW, IDAHO
DRAPER, RON	UK	40:44	X		1962	CARDINGTON
POPA, AUREL	ROM	40:42		X	1996	MOSCOW, IDAHO
BILGRI, JOE	USA	40:37	X		1965	SANTA ANA
NONAKA, SIGEYOSI	JPN	40:36		X	1978	CARDINGTON
STEVENS, DARRYL	USA	40:35		X	1986	SANTA ANA
SHEPHERD, JESSE	USA	40:33		X	1995	AKRON
BAILEY, BOB	UK	40:25		X	1987	CARDINGTON
KIHARA, KAZUMASA	JPN	40:21		X	1997	MATUMOTO CITY
LOTZ, RAINER	GER	40:20		X	1996	MOSCOW, IDAHO
GITLOW, LEW	USA	40:15		X	1987	SANTA ANA
MOSKALEV, VASILI	UKR	40:15		X	1996	MOSCOW, IDAHO
KALINA, JIRI	CZE	40:11		X	1975	CARDINGTON
RODENBURG, OTTO	NED	40:11		X	1986	CARDINGTON
TRIOLO, JOHN	USA	40:06	X		1974	LAKEHURST
MZIK, LARRY	USA	40:01		X	1995	AKRON

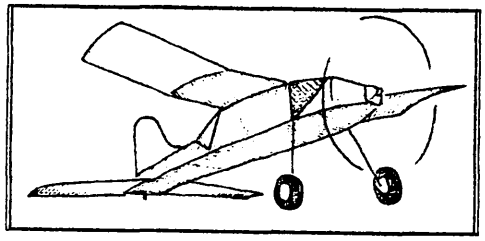
*CLASS 1 – Over 65 cm CLASS 2 – FAI 65 cm – 1 gram

Official and unofficial flights included (best effort only, by individual, by class is shown).

For additions, corrections, etc. send details to:

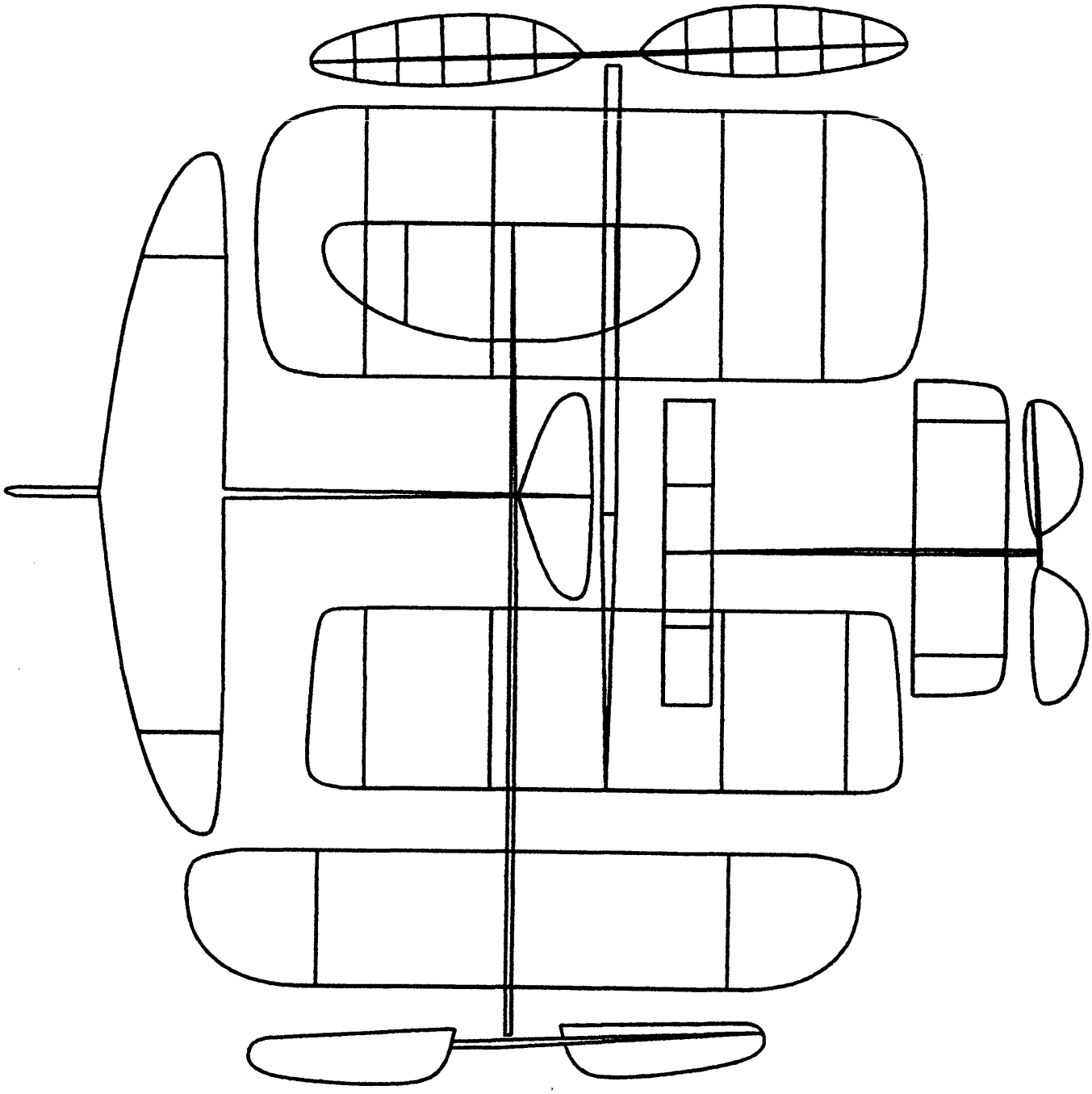
BOB GIBBS 22870 Springmist Drive, Moreno Valley, CA 92557 USA

INAV



USIC/AMA NATS
Johnson City, TN
1998

Issue # 94
June, 1998



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SOME THOUGHTS ON INDOOR

MODEL AIRPLANE PROPELLERS

Jim Grant

This article is written in response to a request which apparently assumes that my experience with full scale propeller blade design fifty plus years ago qualifies me as a model airplane propeller expert. The fundamental geometry and function are the same, but differences in scale effect and construction methods are apparent. Even longer ago I was fortunate to have learned about model propellers of all types from such modelers as John Tyskewicz, Herb Greenberg, Pete Andrews, and others. The request for this article also specified that it include "no math," so with that limitation let us begin.

First, a foreword is in order. I would emphasize that the propeller is the most important part of the model. A model may be accurately built, finished and rigged but if it has a poorly made, inefficient propeller, the flight results will be quite disappointing. Conversely, a good prop can haul an unbelievably ugly crate through the air. Pay attention to accuracy and suitability when making the propeller.

A propeller blade is a rotating airfoil which transforms horse power, through torque and revolutions rate into thrust, which propels the aircraft, just as a wing is an airfoil which provides lift to support the aircraft. They differ in that the wing moves on a flat plane through the air, whereas a propeller blade moves-along a helical path, and is itself a helical surface modified by thickness in the form of airfoil sections and bulk in the hub region. This intriguing shape, the helix, is a surface which is generated by a radius rotating about and translating along an axis at uniform rates of motion, Let us consider the elements of blade geometry: pitch, blade planform or shape, and airfoil section.

PITCH: The pitch of a propeller is the distance it moves forward in one revolution. It determines the pitch angle progression of the blade airfoil sections from hub to tip. These angles are measured with respect to the plane of rotation which is perpendicular to the thrust line. The progression of these airfoil pitch angles is called "basic pitch angle distribution." For some full scale aircraft, custom designed propeller blades will have slight variations from the basic distribution to accommodate changes in air flow caused by the shape of the forward nacelle or fuselage. However, for model airplanes, basic pitch angles without modification in the form Of "wash in" or "wash out" is probably the best choice, Although there is a slight relative increase in inflow velocity where the airstream passes through the tip area of the propeller disc, it may be advantageous not to "wash in" the tip to compensate, but rather to take advantage of the induced "wash out" which this slight inflow velocity increase causes, just as we "wash out" wing tips to minimize vortex drag and to delay stalling. The pitch angle in the shank or inboard area near the hub is also best left unchanged since this part of the blade provides very little thrust. For carved propellers it should be streamlined as best as possible.

The propeller block shape which will provide perfect helical pitch is shown in figures 1-A, l-B, and l-C. A geometric shape such as this may be used either to carve a wooden propeller or as a form on which to construct built up propellers. A jig mounted on a flat board may be constructed having this form, composed of bulkheads located at specific blade radius percentages, each having the proper pitch angle. Next, all of the bulkheads are surfaced with planking.

The pitch we have been discussing is geometric or theoretical pitch. The actual pitch is less because, like any lifting airfoil the blade assumes an angle of attack to create its thrust. This angle will vary from as high as 6-8 degrees in a power climb to as little as 1 degree during the cruise regime. For a graphic idea of the two pitches see figure 2.

BLADE PLAN FORM: Depending upon limiting factors, such a diameter and function, blade shape may vary form a graceful willow-leaf pattern to a rather unattractive, but quite utilitarian rectangular paddle. The built up blades used on ultra-light models have no restrictions against diameter, pitch, or blade width, and may be shaped for high efficiency. For some other models, such as "Limited Penny Plane" or "Bostonian" the diameter is limited and yet these propellers must absorb the power of much heavier motors. The only answer is the use of wide paddle blades and higher pitch ratios (the ratio of the pitch to the diameter). Blade area distribution fore

and aft of the spar may be varied to create blades of differing flaring capability. Several blade plan form shapes are shown in figures 3-A, 3-B, and 3-C.

AIRFOIL SECTIONS: The section shape currently in use for ultra-lights, AMA Stick, F1D, ROG, etc. is a truncated ellipse with a camber height which may vary from 3-6 percent. Propellers whose blades are formed from sheet wood have a simple are for an airfoil shape. Carved propellers for flying scale, etc. have airfoil sections similar to the "Clark Y."

I hope that this article will provide some help to young modelers of all ages!!

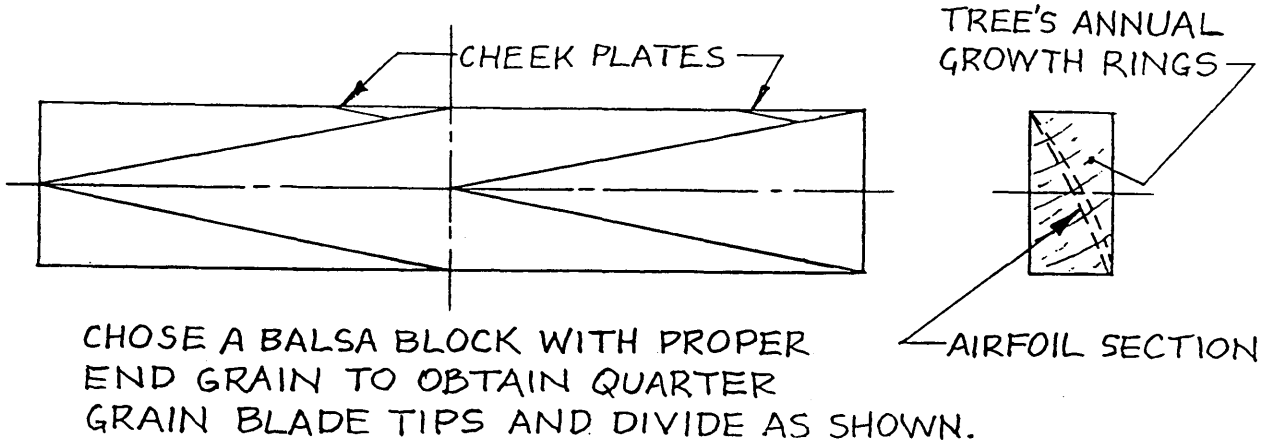


FIG. 1A

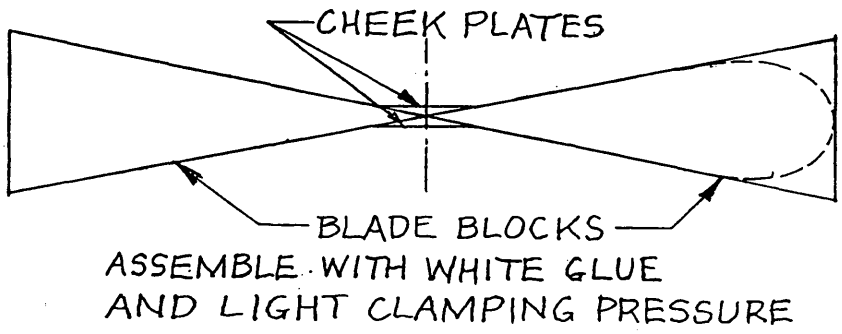


FIG. 1B

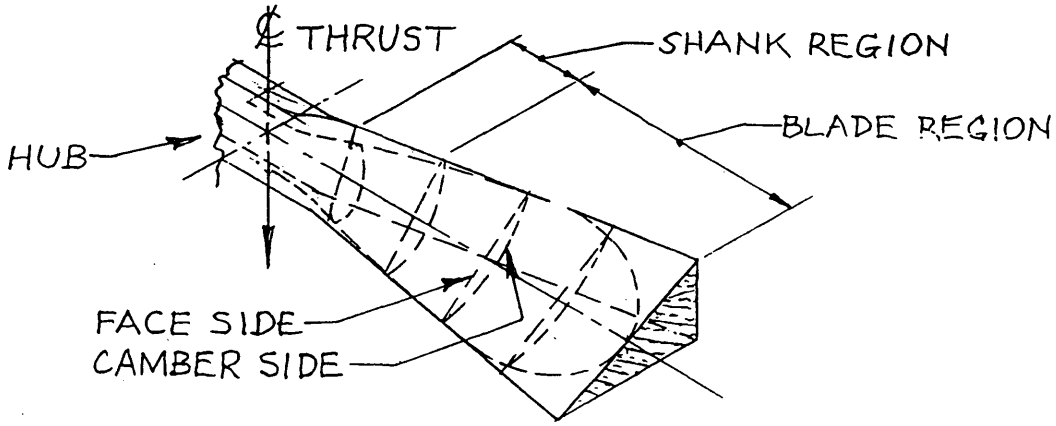


FIG. 1C

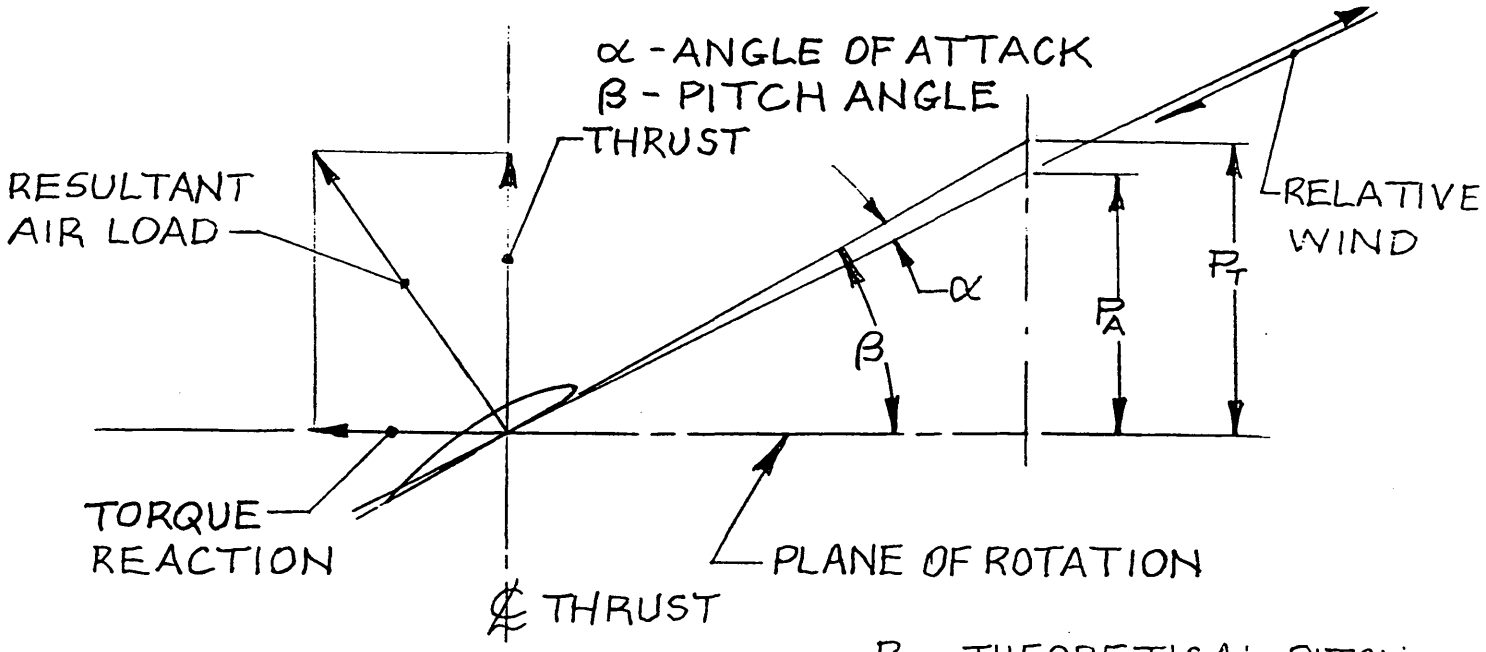

α - ANGLE OF ATTACK
β - PITCH ANGLE
THRUST
RESULTANT AIR LOAD
RELATIVE WIND
α
β
P_T
P_A
TORQUE REACTION
PLANE OF ROTATION
℄ THRUST
P_T - THEORETICAL PITCH
P_A - ACTUAL PITCH

FIG. 2

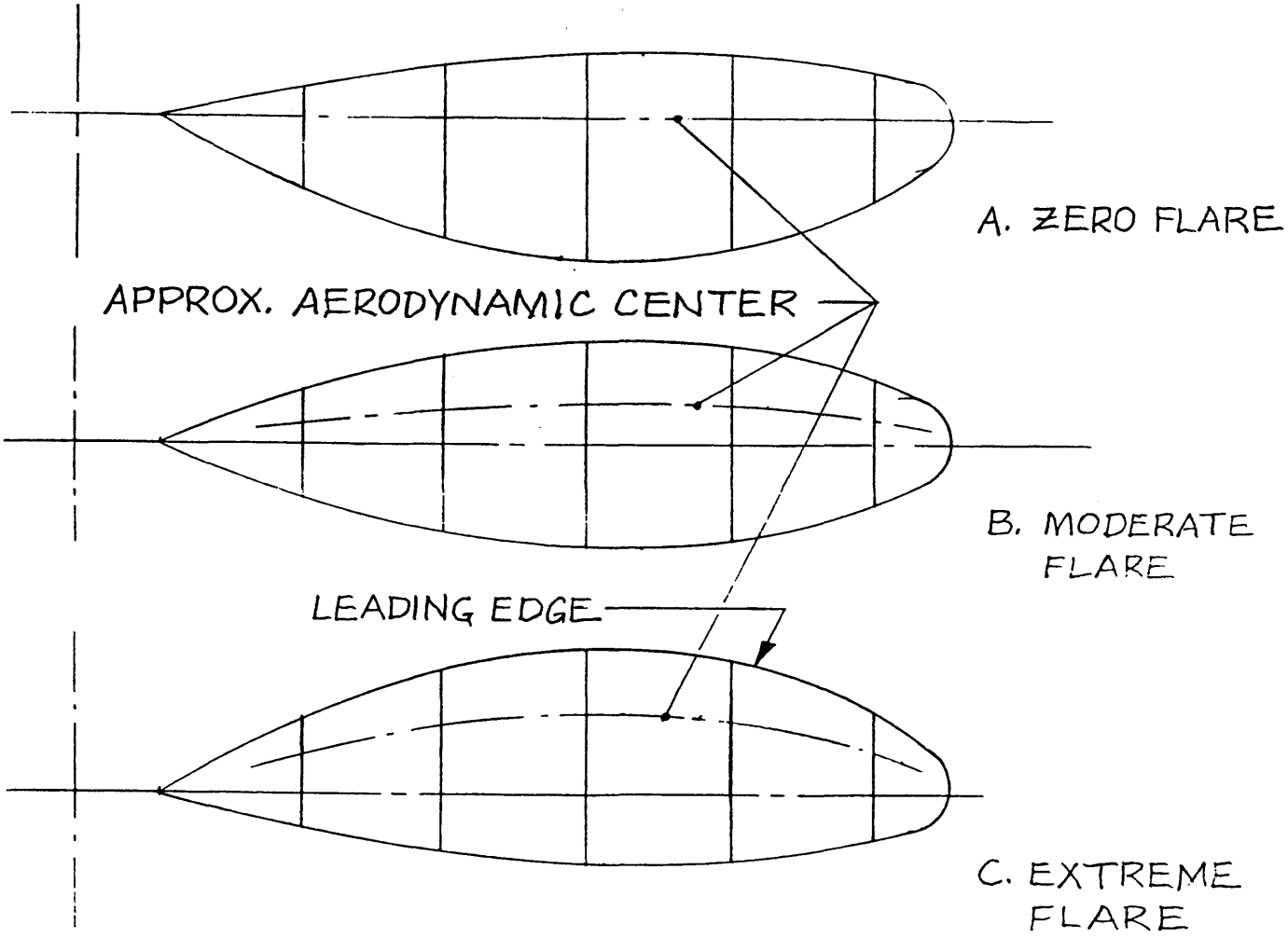

A. ZERO FLARE
APPROX. AERODYNAMIC CENTER
B. MODERATE FLARE
LEADING EDGE
C. EXTREME FLARE

FIG. 3

Use All the Air, But Not the Ceiling

By Larry Coslick

In my opinion, flaring props are the way to fly an EZB at Johnston City. When they are right, the model can get very good no touch times. The idea is to make a long, slow climb to the main beam, go into a long cruse, and then a slow decent. The flaring of the prop slows down the initial RPM and climb. Because early, stronger turns take longer to use, the climb is longer. When the model is torqued properly it will take about 13 minutes to reach the main beam or slightly above it. It will cruse for another 4 minutes and hopefully avoids a mid-air and lands with the winning time.

A flaring prop can use more rubber effectively that a symmetrical prop can. You need the wider cross section to give the cruise torque and let the flaring prevent too high a climb. I use a motor approximately 18% heavier than the weight of the model. My model weighs .53 gram and the rubber weighs .62 gram. Motor stick length compared to rubber motor length is also important. For my style of flying, an 8.5" M/S is just right with a 13" loop of rubber. 7 to 7.5" M/S models max out at about 27 minutes, you simply can't get the long cruse and let down with a short stick and long loop of rubber because the cruise torque is not high enough.

Light EZB's really like flaring props but they are a little harder to trim at full power (.12 to .13 in. oz. of torque.) I rarely launch above .12 in. oz., because these light props are easy to over power. They will usually flutter when launched above .14 in. oz. If your model weights from .5 to .6 grams and you have to launch above this torque, your prop is probable over pitched, its flaring too much, the rubber motor is undersized, or the model is out of trim. Don't think that by using a lighter motor your times will be better. The rubber has to be matched to the prop.

Flaring props are not hard to make, but you might have to make several to get a really good one. The magic is in the prop spar. A 12" spar with a .009" wire shaft should weigh no more than .035 grams. Build a deflection meter such as the one in the INAV issue #90, of the Hobby Shop EZB article. Assign the prop a number and record the deflection of the spar in both planes. Making prop spars is matter of trial and error. Start by making the spar, .040"X.065", tapered to .025" sq. at the tip. The prop blade outlines that I use are shown in INAV issue #85. They are made from .006" C grain 3.8 pound wood. Two blades will weigh about .075 gram. Use thinned aliphatic (yellow) glue when attaching the blades to the spar. Acetate type glues will continue to shrink, distorting the blades or changing the pitch angle. Prop flair is controlled by the position of the blades on the spar. The one that I use at Johnson City and the Kibbie Dome, has the spar mounted ¼" from trailing edge of the prop blade. Try different spar locations to get the amount of flair needed to control the climb.

If you are not satisfied with the way the prop flares, soak the blades off with water. There will be a small white patch on the spar line of the blades, where the glue was applied. Take a soft toothbrush and carefully brush away any remaining white glue, while the blades are still wet. Make a new spar and adjust the wood sizes according to whether you want more or less flair than before. Reform the

blades before you put them back onto the new spar. I don't bake the blades when forming them, but air-dry them for several days.

My Akron Light EZB requires a fairly stiff tail boom. I still consider the boom of a good EZB to be part of its magic. The wing of this model must have about 1/16" to 1/18" wash in on the right wing panel. Stab wash is not needed on this model. Launch attitude and forward motion during the launch play a big part in the release of the model. The model needs to be launched slightly nose high. I usually launch my models with the prop and thrust bearing between the fingers of my right hand. I move my hand forward releasing the prop and model at the same instant. I don't believe in wasting turns when launching my models.

For safe, no touch flying you must know the exact launch torque each time the model is released. First of all, use O rings. They keep you from losing turns when transferring the motor from the torque meter to the model. You can make them from plastic Q-Tip sticks or ABS tubing from a model railroad hobby shop. Cut them about .020" with a single edge blade. Don't worry about the sharp edges, they don't cut the rubber motor. If your winder does not have a breaking system put one on it. After the motor is wound, there needs to be a device that holds the winder so that the motor is about ½" shorter than the distance between the prop and the rear hook. By being shorter, this helps eliminate grape vining when loading the rubber motor on the model. This device should be adjusted for each different length motorstick.

Work your way up to the ceiling. It's amazing how much a 2/100 in. oz. increase in launch torque will effect a light EZB when its 25 feet from the ceiling. It will put my model into the steel every time. During the practice session at Johnson City, put a balloon up to 50 feet. This will simulate a flight just under the main beam using a ½ motor. Get your model to climb to the top of the balloon. If there are no other models in the area of your EZB, move the balloon close to the model and have someone looking from the side determine the models height.

Indoor flying is not and probably never will be an exact science, but the closer we pay attention to small details the better are times will be.

For plans for putting a simple breaking system on your Wilder winder and a stooge that holds your winder and torque meter the proper distance apart, send me a self-addressed stamped envelope. Foreign subscribers send $1.00, no stamp. I also have plans for a hand held torque meter for EZB and mini-sticks. If you don't like O rings, you can get right on the prop and tell your launch torque. The plans also show how to calibrate a torque meter using any length wire and size to around .020" in diameter.

Larry Coslick
4202 Valley Crest Hills Dr.
St. Louis, MO 63128

USIC 1998 HAND LAUNCHED STICK # 201

	CONTESTANT	AMA NO.	Flt 1	Flt 2	Flt 3	Flt 4	Best Flight
1	Coslick, Larry	2004652	37:11	36:28	41:25	44:01	44:01
2	Dolg, Richard	2005392	38:57	37:47			38:57
3	Kagan, J.		38:30				38:30
4	Slusarczyk, Donald	2005490	6:13	28:06	33:09		33:09
5	Tellier, Fred	2615254	32:56				32:56
6	Hardcastle, Richard	2000847	8:33	29:49			29:49
7	Thomas, Mike	2615041	25:22				25:22
8	Grant, James	2159477	22:35				22:35
9	Burke, Edward J.	2153313	20:12	19:48	8:04		20:12
10	Hacker, Vernon	9000304	14:25	17:09			17:09
11	Barr, Laurie		16:48				16:48
	Clem, Jim	9000055					DNF
	Landrum, Billie	2052674					DNF
	Leonard, Nicholas A., Jr.	2497460					DNF
	Leonard, Nick A.	2497461					DNF
	Loucka, Larry	2001210					DNF
	Nuszer, Joseph	2029036					DNF
	Vallee, Thomas	2001126					DNF
			FINAL SCORES				

USIC 1998 INTERMEDIATE STICK # 202

PLACE	CONTESTANT	AMA NO.	FLT 1	FLT 2	FLT 3	FLT 4	Flt 5	Best Flight
1	Hunt, Bernard		29:32	34:38	36:00	37:19	14:50	37:19
2	Kagan, John		34:14	16:11	35:49	31:06		35:49
3	McGillivray, Jack	2615483	28:49	35:06	34:25	17:14	20:05	35:06
4	Barr, Laurie		27:54	10:41	8:13	14:00	34:20	34:20
5	Slusarczyk, Donald	2005490	26:20	ATT	30:48			30:48
6	Hardcastle, Richard	2000847	28:56	30:38	13:11			30:38
7	Tellier, Fred	2615254	12:22	25:21	27:17	28:51		28:51
8	Barker, John	2002095	13:48	18:32	25:58	4:59	26:51	26:51
9	Sova, Tom	2473169	10:26	12:25	22:20	24:46	26:07	26:07
10	Grant, James	2159477	19:33	26:01	24:17	4:09	26:04	26:04
11	Olshefsky, Peter	2614476	22:03	4:33	24:57	19:13		24:57
12	Thomas, Mike	2615041	21:52	17:56	8:21			21:52
13	Nuszer, Joe		20:21	21:33				21:33
14	Romash, Robert	2130061	19:34	20:46	20:02			20:46
15	Belleff, Daniel		1:44	14:48	20:41			20:41
16	Hacker, Vernon	9000304	10:31	13:06	18:33			18:33
17	Slusarczyk, Charles	2002643	16:24					16:24
18	O'Grady, Dan	2614475	6:08					6:08
	Vallee, Thomas	2001126						DNF
	Raymond-Jones, D.C.	2063358						DNF

USIC 1998 FID # 203

PLACE	CONTESTANT	AMA NO.	FLT. 1	FLT. 2	FLT. 3	FLT. 4	FLT. 5	FLT.6	TOTAL BEST TWO
1	Coslick, Larry	2004652		43:29	42:53				86:22
2	Kagan, J.		40:27	41:28		36:27			81:55
3	Doig, Richard	2005392	36:16	39:03	37:16	37:12	33:58	7:21	76:19
	Thomas, Mike	2615041	35:17	35:42					70:59
	Hunt, Bernard		26:45	10:19	42:11				68:56
	Hulbert, William	2001317	22:15	31:54	27:37	35:39			67:33
	Vallee, Thomas	2001126	26:54	31:54	33:05	31:31			64:59
	Tollier, Fred	2615254	36:40	23:58					60:38
	Joshu, Eugene	2260643	25:51	29:38	30:56	9:03			60:34
	Leonard, Nick	2497461	24:54	11:59	19:20	25:26	27:43		53:09
	Leonard, Nicholas	2497460	23:03	24:20	23:21				47:41
	Clem, Jim	9000055	16:17						16:17
	Hacker, Vernon	9000304	13:03						13:03
	Slusarczyk, Donald	2005490							
	Slusarczyk, Charles	2002643							
	Burke, Edward	2153313							
				FINAL SCORES					

USIC 1998 UNLMTD CLASS CAT GLIDER # 219

PL	CONTESTANT	AMA NO.	FLT 1	FLT 2	FLT 3	FLT 4	FLT 5	FLT 6	FLT 7	FLT 8	FLT 9	BEST FLIGHT	SECOND BEST FLT	10
1	Boehm, Bernard	2092567	80.1.	83.2	86.2	85	84.1	82	83.5	76.3	DNF	86.2	85	171.2
2	Von Bueren, Karl	2051477	79.8	80	77.6	77.7	75.6	75.6	82.7	79.2	83.3	83.3	82.7	166
3	Warmann, Robert	2018748	80.2	78.4	74.4	8.2	21.4	73	DNF	DNF	DNF	80.2	78.4	158.6
4	Schlarb, Ralph	2322352	78.5	74.3	78.8	79.5	85.4	74.5	DNF	DNF	DNF	79.5	78.8	158.3
5	Schlarb, W.L.	2014425	78.5	74.2	76.8	78.7	77.2	79.1	DNF	DNF	DNF	79.1	78.7	157.8
6	Fulmer, Keith	2031552	75.5	73.5	56.2	71.5	69.7	75	84.1	71.2	DNF	75.5	75	150.5
7	Romash, Robert	2130061	74.9	75.1	74.5	DNF	DNF	DNF	DNF	DNF	DNF	75.1	74.9	150
8	Person, Lee	2383504	75.2	59.9	74	71.5	73	58	70.6	72.5	73.5	75.2	74	149.2
9	Cawthorne, John	2560561	73.8	73.7	69.8	75	72.4	64.2	70.6	73.4	71.9	75	73.8	148.8
10	Marett, John	2616261	70.4	67.6	69.4	68.2	66.6	62.2	67.8	72	67.6	72	70.4	142.4
11	Belleff, Dan	12816	44.5	52.6	72.6	61	63.4	67.7	67.5	69.4	67.1	72.6	69.4	142
12	Nishanian, Peter	2589485	62	32	61	38.3	10.2	61.6	53.8	56.7	DNF	62	61.6	123.6
13	Johnson, T.E.	2016707	49.7	50	55.2	47	53.6	54.7	DNF	DNF	DNF	55.2	54.7	109.9
14	Vandover, Abram	2000894	12.8	47.5	45	46.6	46.7	48.6	45.8	42.9	40.3	48.6	47.5	96.1
15	Thomas, Mike	2615041	39.1	5.8	19.4	32.9	36.1	30.7	42.3	7	26.8	42.3	39.1	81.4
	Cawthorne, John, Jr.	2560562	(Junior)											DNF
	Doig, Richard	2005392												DNF
	Kimball, Bruce	20559849												DNF
	Kelly, James	2037564												DNF
						FINAL SCORES								

USIC 1998 EASY B # 206

PLACE	CONTESTANT	AMA NO.	FLT. 1	FLT. 2	FLT. 3	FLT. 4	FLT. 5	BEST FLT.
1	Coslick, Larry	2004652	26:13	28:16	29:50			29:50
2	Calliliau, Lawrence	2079985	27:42	27:17	27:41	28:07		28:07
3	Hunt, Bernard		19:16	27:27				27:27
4	McGillivray, Jack	2615483	26:17	22:47	10:36	27:24		27:24
5	Slusarczyk, Donald	2005490	23:51	26:21	23:23	23:54	24:25	26:21
6	Kimball, Bruce	2059849	21:33	25:15	25:34			25:34
7	Thomas, Mike	2615041	9:53	22:10	25:19			25:19
	Gardner, Steve		19:30	25:00	24:07			25:00
	Tellier, Fred	2615254	21:10	23:45	19:03			23:45
	Walton, Nick	2397340	6:32	19:02	23:36	21:45		23:36
	Barr, Laurie		23:18	4:02	19:41	10:20	21:57	23:18
	Van Gorder, Walter	2019912	20:32	23:12				23:12
	Hardcastle, Richard	2000847	22:11	19:35	20:56	20:24	22:16	22:16
	Raymond-Jones, D.	2063358	0:08	19:15	20:03	21:59		21:59
	Sova, Tom	2473169	15:51	19:15	21:12	21:06	8:30	21:12
	Obarski, Richard		19:01	16:26	18:29	18:47	20:33	20:33
	Kagan, John		19:46					19:46
	Olshefsky, Peter	2614476	6:33	11:21	10:35	19:42	8:16	19:42
	Kehr, Joe	2549294	18:28	12:26	6:04	13:52	5:35	18:28
	Fellin, John	2095353	13:24	15:11	16:21	15:44	17:45	17:45
	Slusarczyk, Charles	2002643	15:38	17:42	10:15			17:42
	Wisniewski, Gordon	2000716	17:26	11:40	13:09			17:26
	Zufelt, James	2615152	7:21	3:13	9:29	13:49	17:13	17:13
	Singer, Len	2209081	17:10					17:10
	Vallee, Thomas	2001126	16:47					16:47
	Barber, Douglas	2056270	15:49	10:21	15:08	16:31		16:31
	Romash, Robert	2130061	15:26	15:57	16:00	16:28		16:28
	Barker, John	2002095	13:49	15:25	10:13	13:52	0:28	15:25
	Hacker, Vernon	9000304	10:42	13:36	5:11			13:36

	Wrzos, Chester	2020454	12:33	11:26				12:33
	Tellier, Robert		7:09	12:20				12:20
	Rash, Fred	2063458	11:22	12:09	11:44			12:09
	Vandover, Abram	2000894	10:58	12:00				12:00
	Cawthorne, John	2560561	11:52	11:38				11:52
	Von Bueren, Karl	2051477	8:52	6:49	4:40			8:52
	Joshu, Eugene	2260643	0:13					0:13
	Phillips, W.H.	2009088						DNF
	O'Grady, Dan	2614475						DNF
	Martin, William							DNF
	Grant, James	2159477						DNF
	Clem, Jim	9000055						DNF
			FINAL SCORES					

USIC 1998 PENNYPLANE # 207

PLACE	CONTESTANT	AMA NO.	Flt 1	Flt 2	Flt 3	Flt 4	Flt 5	Best Flight
1	Thomas, Mike	2615041	18:47	16:29	18:17			18:47
2	Hunt, Bernard		17:35	17:58	18:33	18:20		18:33
3	Olshefsky, Peter	2614476	17:16	17:19	16:56	18:08		18:08
4-TIE	Walton, Nick	2397340	16:35	17:42	16:59	17:09	3:44	17:42
4-TIE	Wisniewski, Gordon	2000716	8:00	16:26	9:58	17:18	17:42	17:42
5	Hartman, Phillip	2008667	11:59	15:40	17:12	7:15	6:35	17:12
6-TIE	Coslick, Larry	2004652	12:40	13:52	15:17	16:21	15:48	16:21
6-TIE	Tellier, Fred	2615254	13:02	16:21				16:21
	Kagan, J.		15:58	16:17				16:17
	Clem, Jim	9000055	15:41	15:05	9:29			15:41
	Warmann, Robert	2018748	15:35	13:58	12:19			15:35
	Landrum, Billie	2052674	14:08	10:28	14:31	15:11	6:00	15:11
	Grant, James	2159477	15:09					15:09
	Hardcastle, Richard	2000847	15:08	14:42	10:41			15:08
	Nuszer, Joseph	2029036	14:30	15:08				15:08
	Vallee, Thomas	2001126	8:04	14:19	15:07			15:07
	Obarski, R. W.	2000560	11:05	12:20	11:41	4:24	14:39	14:39
	Kirby, Noel C.	2267885	12:59	14:31				14:31
	Sova, Tom	2473169	9:11	14:17	7:32	14:31		14:31
	Cawthorne, John	2560561	12:53	14:01				14:01
	Phillips, W.H.	2009088	10:58	13:34	11:23	11:38		13:34
	Rash, Fred	2063458	13:12	13:05				13:12
	Kimball, Bruce	2059849	11:52	13:01	13:01			13:01
	Romash, Robert	2130061	11:31	12:20	10:06	9:05	11:32	12:20
	Sullivan, Edward	2069585	8:46	8:56	5:41	12:13		12:13
	Tellier, Robert		9:14	10:35	11:13	7:45		11:13

Place	CONTESTANT	AMA NO.	Flt 1	Flt 2	Flt 3	Flt 4	Flt 5	Best Flight
	Barber, Douglas	2056270	10:07	11:04	11:04			11:04
	Hacker, Vernon	9000304	7:02	9:19	8:53	10:46		10:46
	Wrzos, Chester	2020454	10:35					10:35
	Kent, Michael	2614477	9:50	10:26	9:25			10:26
	Von Bueren, Karl	2051477	10:10	10:20				10:20
	Zufelt, James	2615152	9:16	8:10	9:45	10:06		10:06
	Italiano, A.J.	2002386	9:28	8:49	2:24	2:28	9:43	9:43
	Raymond-Jones, D.	2063358	7:03	8:43				8:43
	Tenny, Bud		5:24					5:24
	Bakay, Carl	2478659	DNF					
	Fellin, John	2095353	DNF					
	Gagliano, Victor	2110081	DNF					
	Joshu, Eugene	2260643	DNF					
	Loucka, Larry	2001210	DNF					
	O'Grady, Dan	2614475	DNF					
	Plassman, Gerald E.	107613	DNF					
	Slusarczyk, Charles	2002643	DNF					
	Vandover, Abram	2000894	DNF					

USIC 1998 LTD. PENNYPLANE # 208

Place	CONTESTANT	AMA NO.	Flt 1	Flt 2	Flt 3	Flt 4	Flt 5	Best Flight
1	Cailliau, Lawrence	2079985	15:07	16:04				16:04
2	Kagan, John		13:48	13:38	15:30	15:03		15:38
3	McGillivray, Jack	2615483	11:54	12:05	14:31	15:25	12:53	15:25
4	Thomas, Mike	2615041	14:26	15:03	13:39	15:24	6:55	15:24
5	Marett, John	2616261	4:13	12:58	14:12	12:39	14:56	14:56
6	Hunt, Bernard		13:25	14:55				14:55
7	Wisniewski, Gordon	2000716	13:43	14:11	14:46			14:46
8	Krol, Greg		14:41	3:21	9:46	11:29		14:41
9	Clem, Jim	9000055	12:55	13:08	14:30			14:30
	Miller, Richard	2179518	13:16	14:14	12:42			14:14
	Cawthorne, John	2560561	14:01	7:22	14:07			14:07
	Grant, James	2159477		12:02	13:01	12:14	14:02	14:02
	O'Grady, Dan	2614475	12:15	13:56				13:56
	Romash, Robert	2130061	13:55					13:55
	Sova, Tom	2473169	11:16	13:42	13:17	13:51		13:51
	Tellier, Fred	2615254	13:03	13:50	13:07	13:47	6:55	13:50
	Van Gorder, Walt	2019912	12:59	13:48	3:31			13:48
	Olshefsky, Peter	2614476	11:59	13:43	12:09			13:43
	Von Bueren, Karl	2051477	10:50	13:29	13:42			13:42
	Kehr, Joe D.	2549294		12:28	13:13	12:52	13:33	13:33
	Gardner, Steve			13:13	11:09	13:26	11:27	13:26
	Joshu, Eugene	2260643	13:24	13:00	12:54	12:19		13:24
	Kimball, Bruce	2059849	12:51	13:17				13:17
	Barr. Laurie		12:02	13:06	11:55	2:41		13:06
	Barker, John	2002095	12:04	1:29	4:29	13:04	5:45	13:04
	Warmann, Robert	2018748	13:02	11:47	11:26	3:43	4:11	13:02
	Hardcastle, Richard	2000847	3:35	11:47	12:58	11:04		12:58

Place	CONTESTANT	AMA NO.	Flt 1	Flt 2	Flt 3	Flt 4	Flt 5	Best Flight
	Hacker, Vernon	9000304	9:50	10:40	12:55	10:20	9:20	12:55
	Walton, Nick	2397340	2:12	12:51	12:18	10:39	3:26	12:51
	Hartman, Phillip	2008667	12:33	3:59	12:41	12:49		12:49
	Rash, Fred	2063458	12:32	12:31	2:30			12:32
	Barber, Douglas	2056270	9:25	11:40	12:10	4:59	12:28	12:28
	Coslick, Larry	2004652	11:47	12:24	5:16	5:46	5:12	12:24
	Martin, Wm.		12:24	10:20	11:33	3:23		12:24
	Raymond-Jones, D.	2063358	12:14	10:12	7:43	7:26	10:49	12:14
	Slusarczyk, Charles	2002643	12:03	3:31				12:03
	Fellin, John	2095353	11:31	6:11	11:32			11:32
	Singer, Len	2209081	4:29	11:28				11:28
	Diebolt, H. J.	2097263	8:47	9:35	6:36	1:38	11:27	11:27
	Slusarczyk, Don		2:52	11:26	9:46			11:26
	Sullivan, Edward	2069585	6:48	11:06	9:24			11:06
	Nuszer, Joseph	2029036	8:04	10:57				10:57
	Tellier, Robert		10:35	10:52	9:25	9:19		10:52
	Vandover, Abram	2000894	7:18	8:09	10:16	10:41	10:16	10:41
	Wrzos, Chester	2020454	10:39	7:16	9:38			10:39
	Cawthorne, John, Jr.	560562	10:39	10:35				10:39
	Campbell, Dann	2346641	8:32	9:59	9:34	10:24		10:24
	Zufelt, James	2615152	10:21	4:22	7:29	7:34	8:38	10:21
	Boone, Jack L.	2107857	8:07	9:34		10:14		10:14
	Kent, Michael	2614477	7:58	7:31	9:20	6:51		9:20
	Italiano, A.J.	2002386	7:31	8:35	6:48	9:18		9:18
	Tenny, R.		8:28					8:28
	Landrum, Billie	2052674			8:24			8:24
	Kirby, Noel C.	2267885	7:00	2:37				2:37
	Bakay, Carl	2478659						DNF

USIC 1998 HELICOPTER # 209

PLACE	CONTESTANT	AMA NO.	FLT 1	FLT 2	FLT 3	FLT 4	FLT 5	BEST FLIGHT
1	Thomas, Mike	2615041	8:43	8:12	8:56			8:56
2	Loucka, Larry	2001210	7:10	8:30				8:30
3	Diebolt, H. J.	2097263	4:16	6:33				6:33
4	Vallee, Thomas	2001126	ATT (:50)	5:16	1:28	2:07	5:25	5:25
5	Ripley, Ed	2484619	2:46	4:35				4:35
								0:00
				FINAL SCORES				

USIC ROG CABIN # 204

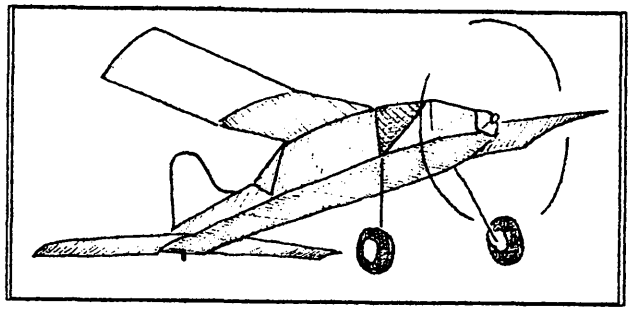
PLACE	CONTESTANT	AMA NO.	FLT 1	FLT 2	FLT 3	FLT 4	FLT 5	FLT 6	BEST FLIGHT
1	Loucka, Larry	2001210	21:40	30:19					30:19
2	Slusarczyk, Donald	2005490	27:19						27:19
3	Thomas, Mike	2615041	21:24	24:35	26:57				26:57
						FINAL SCORES			

USIC 1998 MANHATTAN # 205

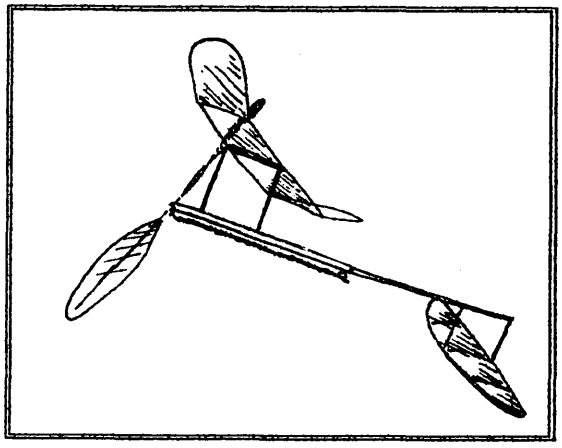
PLACE	CONTESTANT	AMA NO.	FLT 1	FLT 2	FLT 3	FLT 4	FLT 5	FLT 6
1	Coslick, Larry	2004652	11:44	13:58				13:58
2	Van Gorder, Walter	2019912	13:31	13:41 DROPPED PARTS				13:31
3	Thomas, Mike	26115041	10:39	8:34	12:17	2:59	12:29	12:29
4	Marett, John	2616261	9:05	10:20	11:37	4:02		11:37
5	Loucka, Larry	2001210	9:34	11:23				11:23
6	Grant, James B.	2159477	2:30	8:56	10:24	9:39	10:59	10:59
7	Slusarczyk, Charles	2002643	7:40	9:54	10:14			10:14
8	Diebolt, H. J.	2097263	8:34	8:26	9:29	8:54	9:36	9:36
9	Schutzel, Emil	2508384	6:59	7:32	9:30	7:10	7:57	9:30
10	Tellier, Fred	2615254	8:08	8:53				8:53
11	Raymond-Jones, D.	2063358	2:28	7:34	8:13			8:13
12	Martin, William		6:02	6:32	4:35	6:32		6:32
13	O'Grady, Dan	2614475						DNF
				FINAL SCORES				

USIC/AMA Nats Highlights
By Steve Gardner

A very nice contest. Lots of events to fly and to watch along with lots of nice people to talk to and learn from. Not as many people as last year though, entries are steadily dropping for various reasons and so this contest is becoming a bit more intimate. We sure could use a few more new faces, especially younger ones.



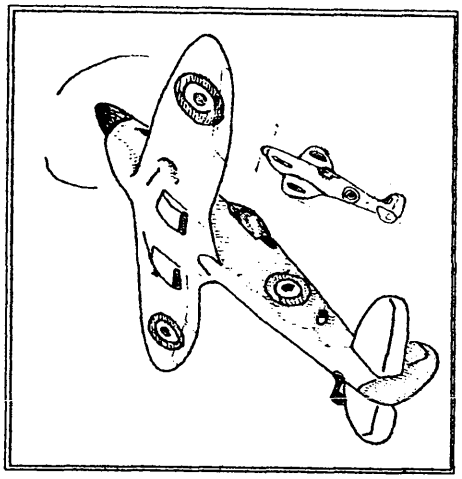
Which batch are you using? Rubber was on the minds of most of the rubber flyers this year. With the last few batches of FAI tan II testing very good to great it looked for a while that 8/93 would loose the crown as the best rubber ever. Not yet. What is probably the next best rubber, 7/97, is turning out to be a fickle material. I used a single motor made from 7/97 and wound as tight as a tick for four LPP flights in a row without any problems, yet Larry Coslick tried it and blew up several motors before turning to 8/93 for the rest of the day. 7/97 can perform as well as 8/93 if you are lucky and get a good piece, but 8/93 is still the best choice for most events. One exception may be events that demand good cruise performance like LPP and Bostonian. For these events 10/97 or 12/97 may be the hot ticket. These batches do not have the initial power that 7/97 or 8/93 have, but they do seem to have a very good cruise phase. Several flyers used 10/97 for Bostonian with great results. This rubber is tough! It will take lots of turns and hang in there during cruise.



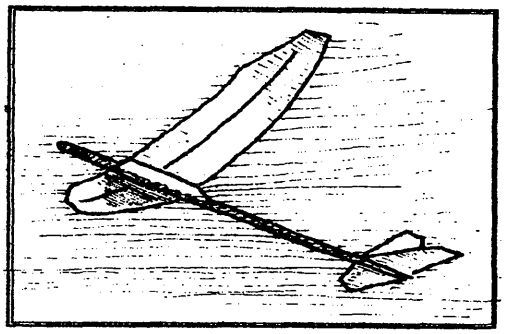
There may have been lots of new rubber flying around, but most people stuck with tried and true model designs. Larry and I were very pleased to see a very large number of well-built Hobby Shop EZBs floating around. All the identical models made for difficult model identification with the prop blade profile being the best way to tell yours from theirs. An exception to the same old thing rule was Bernard Hunt and his fleet of new "Stork" style models. Bernard is trying to eliminate the interference between the wing and the stab on his models by using very long wing posts and mounting the stab on the bottom of the fin. These models are a bit odd looking at first, but when in flight they are graceful, reminding me of tall ships.

Bernard also spearheaded the introduction of the newest FAI event, F1M, to American contests. A demonstration of F1M, also known as F1Db or F1D beginner, was flown

along with an informal contest. Like outdoor rubber where there is a weight limit on the rubber carried to lower performance. Plans and details about this new event were included in the previous INAV issue.



In the scale events there was just a fair turnout with the FAC events leading the way like always. The group lead by Tim Lavender from Smyrna made their presents known by fielding several juniors who each had some very good models. Several pretty profile scale models along with a few peanuts, pistachios, bostonians, and even three coconuts were campaigned by this FAC group. Mr. Lavender is to be commended for once again serving as the sparkplug for this wonderful group of young flyers as well as for the very well built scale models he flew himself. A couple hundred of people like him and we would not have a junior problem.

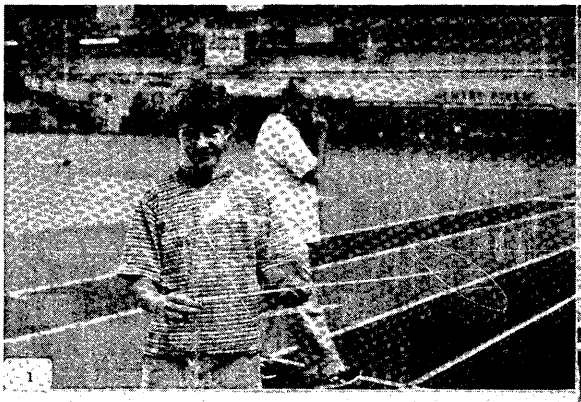


The glider guys filled the air with whistling balsa as usual. It is really amazing how long they can get a bit of balsa to stay up by just shooting or tossing it up into the air. Not all the things whistling around were made of balsa, either. Bruce Kimball was flying an all composite HLG. Just blue foam, carbon, fiberglass, and epoxy. Built like a state of the art R/C sailplane with the wings vacuum bagged to give a perfect finish. He even had a wing built with elliptical dihedral using this method. Innovation did not die when they outlawed the folders! With the precise control this method allows perhaps the search for the magic airfoil will get a good bit further along. I think you will see more of these models in the future.

I do have to sound one discordant note. For some reason the method of choosing the Grand Champion outlined in the AMA rulebook was simply ignored. The rules state that each contestant can choose a certain number of specific events (9 in the this case) to be used to compile his personal score from, and that the scores from each individual event be "normalized" (the winner gets 100 points, 2nd gets a percentage of 100 based on the percentage his best time was of the winners best time. Example: winner, 200 seconds = 100 points, 2nd place, 180 seconds = 90 points). The points are them added up from the events chosen by the contestant. The way this contest was scored appeared to be that all 21 events were counted, and in each event there was no effort to normalize the score. A flyer one second out of first place scored as poorly as one in 2nd place with less than half the time of the winner. It boiled down to who had the time to fly the most events instead of who flew the best. There is a movement afoot to change the way the rule book reads to simplify the scoring and eliminate the exotic, low participation events. Let us know what you think, OK?

Picture Captions

1. Nick Lenard Jr. member of the US F1D world championship team going to Salonic, Romania this October
2. Chuck Slusarczyic and his new design Pennyplane.
3. Mike Thomas prepares his ROG cabin for a test flight.
4. Peter Olshefsky and his 35CM stick.
5. Bill Hulbert putting his F1D together.
6. Bernard Hunt with the EZB version of his unusual "stork" series of models designed to get the stab out of the wing's wake.
7. Larry Coslick preparing to fly his hand launch stick model.
8. Bernard Hunt with his F1D version of his "stork" series.
9. Bernard Hunt's F1D in flight.
10. Larry Coslick adjusts his F1D.
11. Gene Joshu came to the USIC to break 30 minutes with his plastic covered F1D and he did just that.
12. Here shown in flight, Gene's F1D managed a 30:56.
13. Jim Clem with his Pennyplane.
14. Curtiss Robin rubber scale
15. Jack McGillivary's rubber scale Arado.
16. Rich Miller's wonderful Peanut scale Piper Vagabond.
17. P-39 Aircobra rubber scale.
18. Bellanca observation rubber scale model in flight.
19. John Blair with his Pastachio sized Phantom Flash.
20. Joseph Falconberry with his profile scale Cosmic Wind. Joseph is a member of the Smyrna, Tennessee group.
21. Jack Mc Gillivary with his rubber scale Moth Minor.
22. A Focke Wulf observation rubber scale model by Wayne Anderson of the Smyrna FAC club.
23. Wayne Anderson's rubber scale Me 109.
24. Rich Miller and Jack McGillivary with their incredible peanut Spitfires. Rich beat out Jack's spitfire in the WWII mass launch by just a few seconds, winning the event.
25. Rich's beautiful Spitfire.
26. The Smyrna FAC work area. Nice variety!
27. Tom Vallee with his EZB.
28. Larry Coslick winds his Manhattan Cabin model in preparation for his setting a new site record.
29. Joe Nuszer flying his Intermediate stick model.
30. Tom Sova placed second with his Pro-20.
31. Larry Loucka watches Don Slusarezyk launch his autogyro.
32. Bill Martin winds his Cabin model.
33. Bob Romash with his cute little rubber scale foamy.
34. Bruce Kimball and his very modern all composite HLG. Slick!
35. Fred Tollier, do you know where this piece fits?.....
36. It must go with this wing.....
37. Hey! What do ya know, its an F1D!
38. James Zufelt did a personal best time in EZB of 17 minutes.
39. Bernard Hunt's Pennyplane version of his "stork" design series.
40. Jennifer Smith with her Limited Pennyplane.
41. Michelle Boyd with her two-time winning first place coconut scale General Aristocrat.
42. Marcus Conner launches his coconut scale Evans Volksplane.
43. Smyrna FAC with their Coconut scale models.
44. Bobby Jacobs with his Limited Pennyplane.
45. Tim Lavender, the leader of the Smyrna FAC group, with his Bristol Scout rubber scale model.
46. Stephanie Victory with her Profile scale model.
47. Daniel Jones with his semi-scale glider.
48. Robert Stevens launching his Coconut scale Lockheed Vega. This model really flew well. Robert also placed first in the Junior Limited Pennyplane event with an 11:35!
49. Robert's Vega on the wing.
50. Rich Miller assembling his Currie Wott on floats rubber scale model.
51. Steve Gardner's colorful Monarc Bostonian, managed a 1.19 charisma score using tissue colored with an ink jet printer.
52. Mike Thomas, the 1998 Grand Champion, flew in all 21 AMA events! Here he is with his rubber scale Voison.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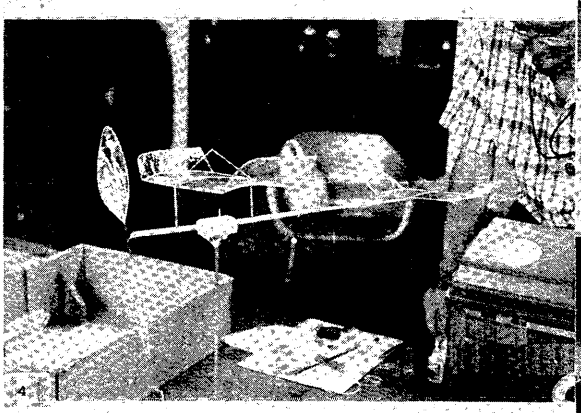
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Johnson City, TN


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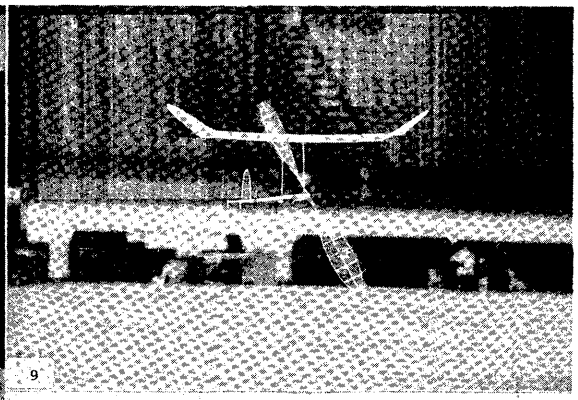
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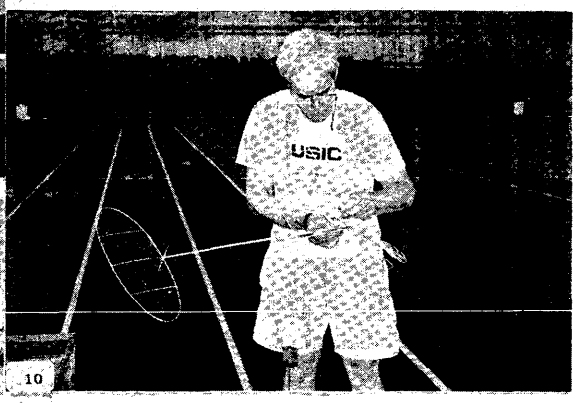

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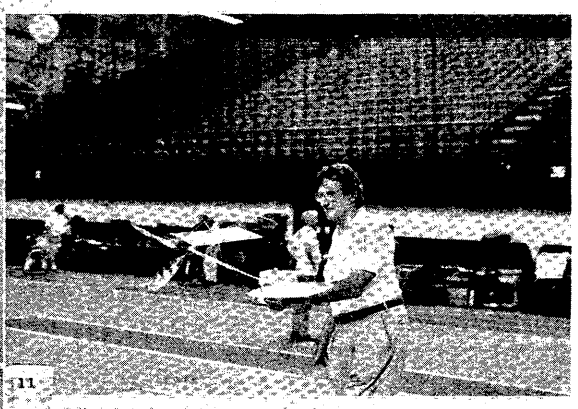
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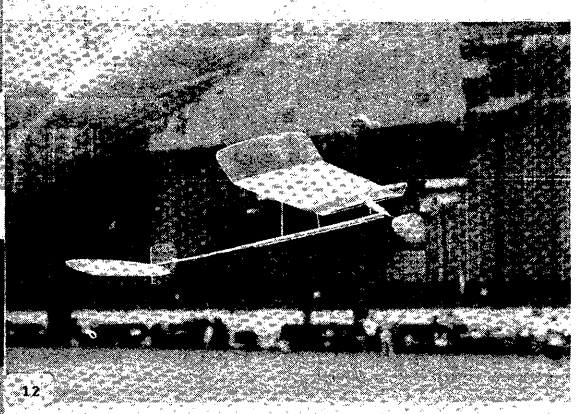
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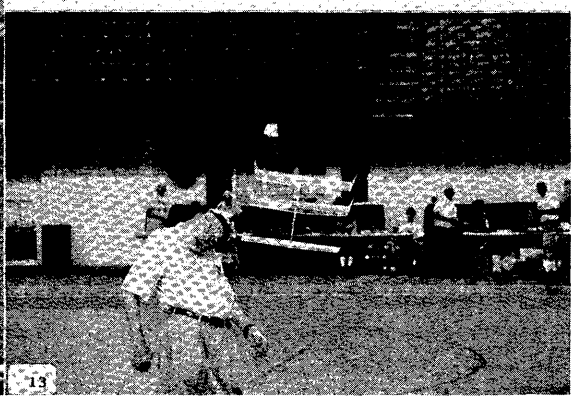
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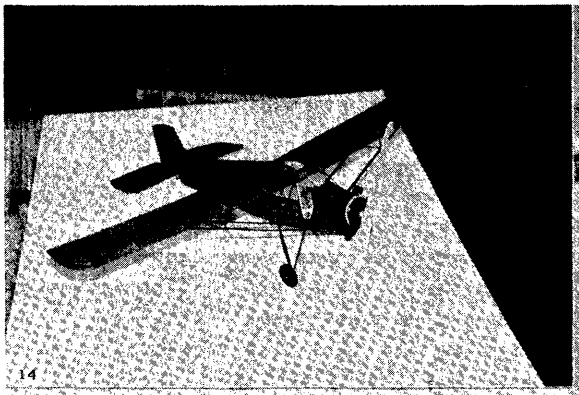

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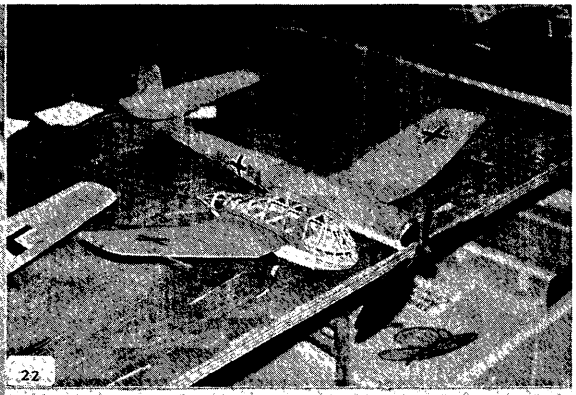

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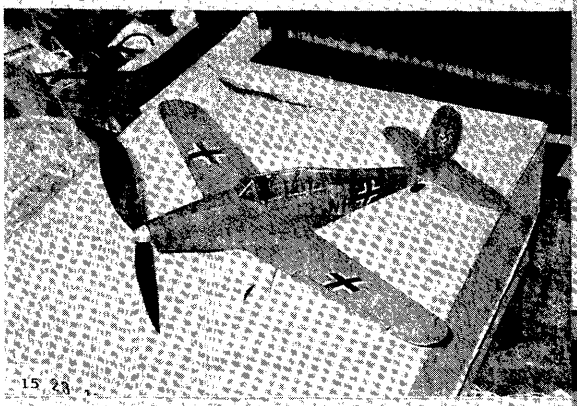

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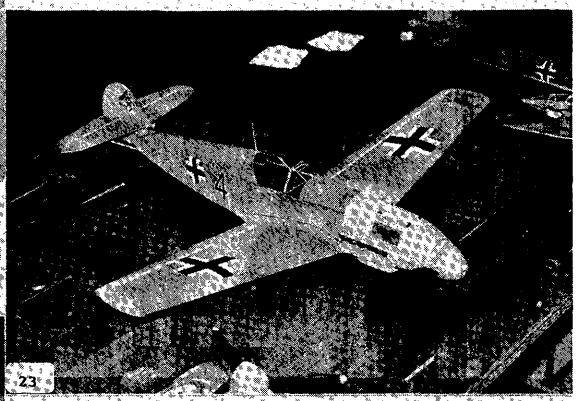

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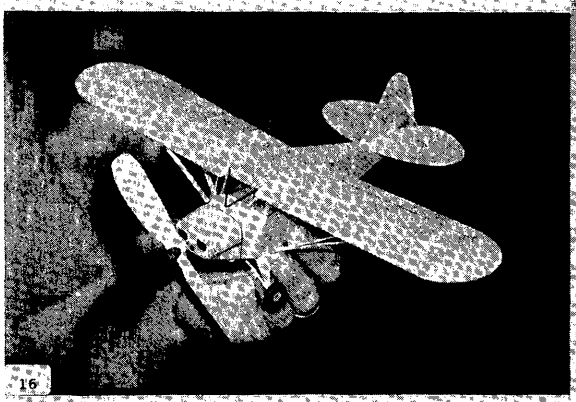

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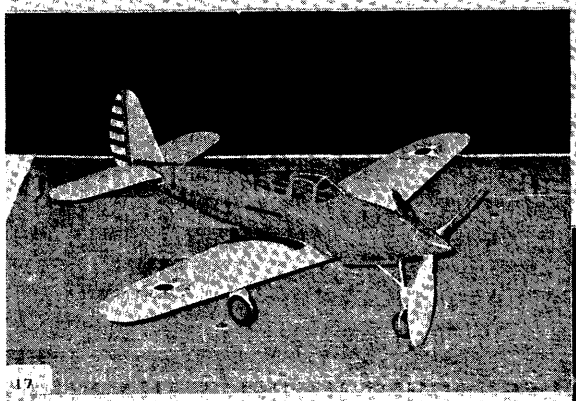

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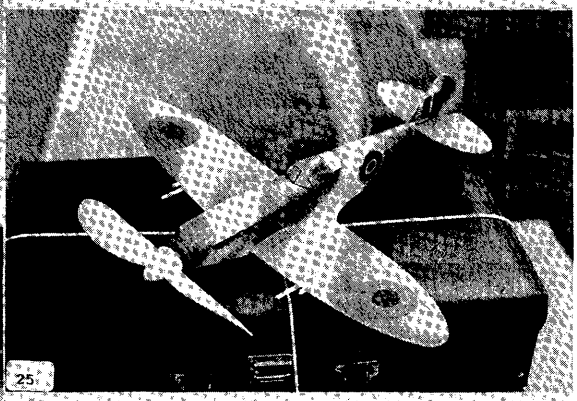

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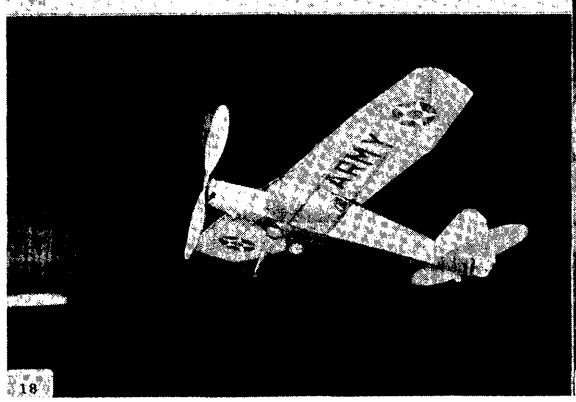

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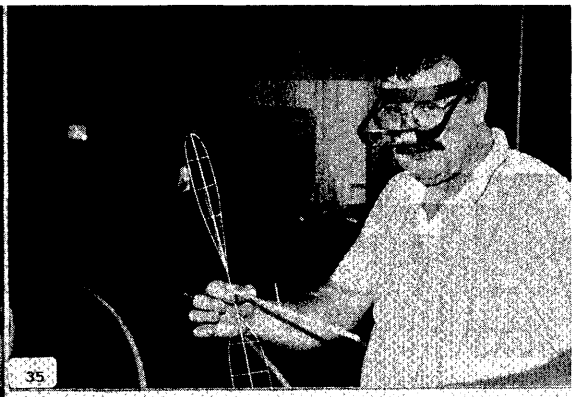
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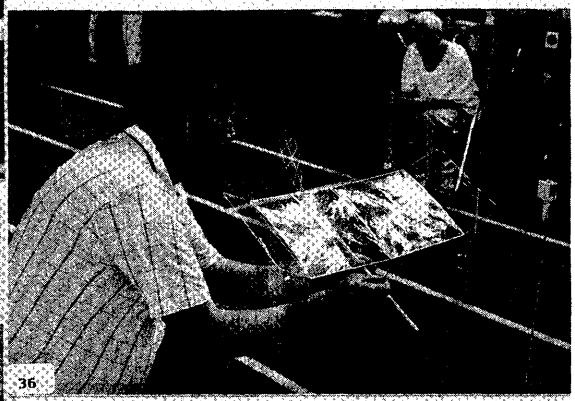
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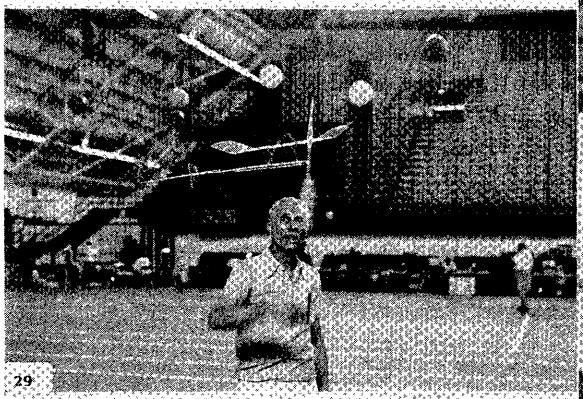
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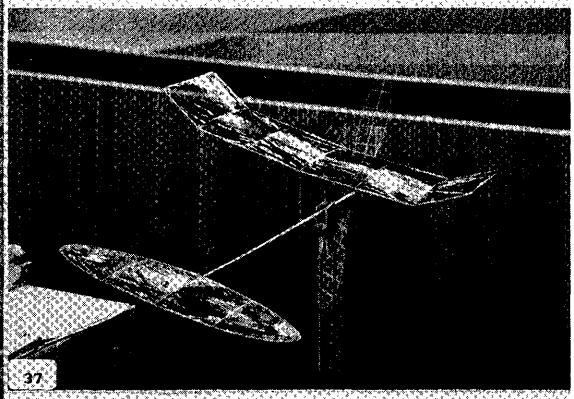
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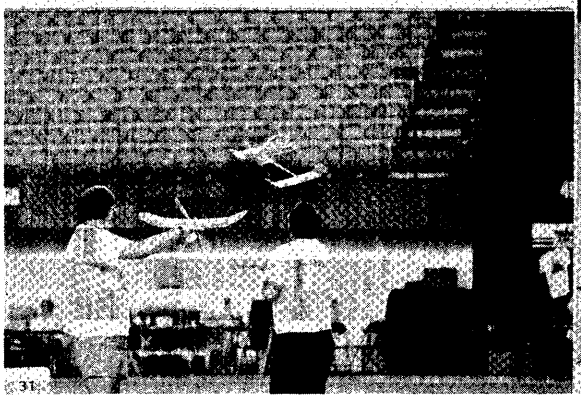
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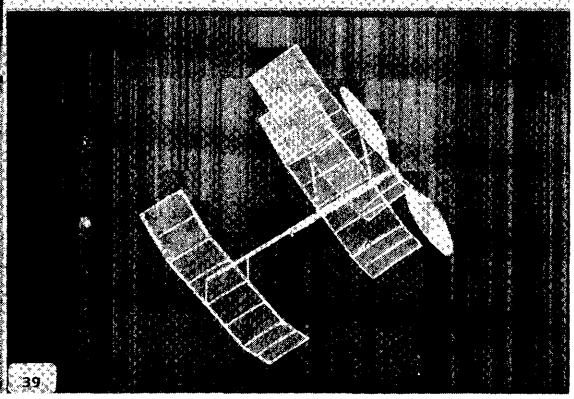
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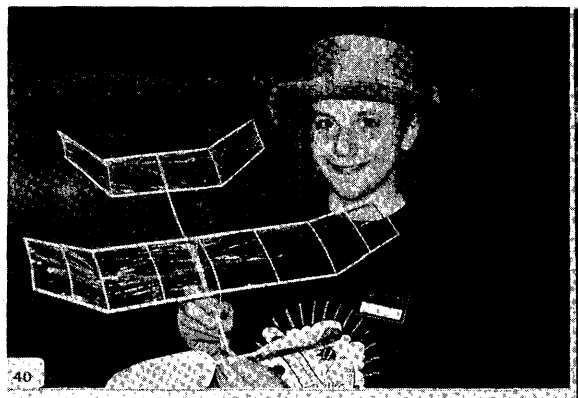
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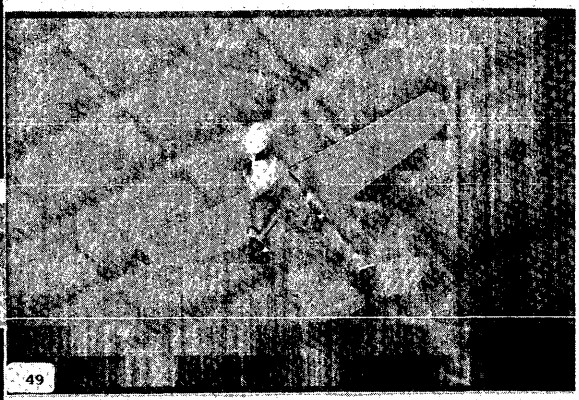
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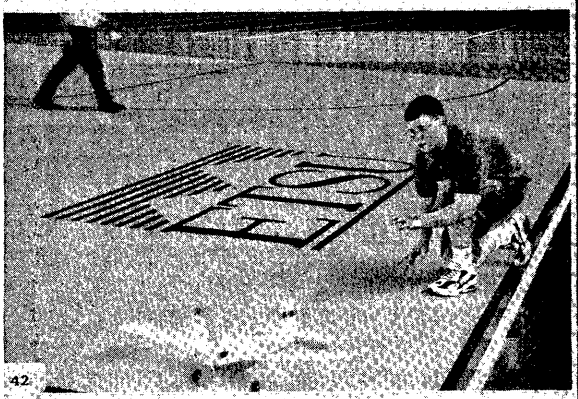
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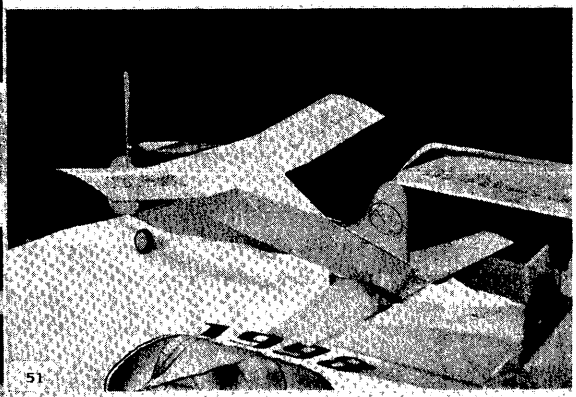
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USIC 1998 AUTOGIRO # 211

PLACE	CONTESTANT	AMA NO.	FLT 1	FLT 2	FLT 3	FLT 4	FLT 5	BEST FLIGHT
1	Thomas, Mike	2615041	16:33					16:33
2	Slusarczyk, Donald	2005490	8:40	10:49				10:49
3	Diebolt, H. J.	2097263	7:48	7:48	8:41	7:52	7:41	7:41
4	Ripley, Ed	2484619	6:48	8:22	7:35			7:35
5	Rash, Fred	2063458	4:02	6:55	7:11	7:32		7:32
				FINAL SCORES				

USIC 1998 HAND LAUNCHED GLIDER # 212

PLACE	CONTESTANT	AMA NO.	FL 1	FL 2	FL 3	FL 4	FL 5	FL 5	FL 7	FL 8	FL 9	BEST FLIGHT	2ND BEST FLIGHT	TOTAL BEST 2
1	Boehm, Bernard	2092567	69.1	72.20	74.4	75.5	74.2	75				75.5	75	150.5
2	Romash, Robert	2130061	64	65.40	63.7	65.8	65.5	62.8	69.2	68.9		69.2	68.9	138.1
3	Gagliano, Charles	2110082	51.8	10.10	38.5	39.2	50.1	56.5	57.2	54.7	60.6	60.6	57.2	117.8
4	Kimball, Bruce	2059849	52.5	52.70	53.8	50.2	50.4	55	52.2	53.5	37.4	55	53.8	108.8
5	Von Bueren, Karl F.	2051477	51.6	46.00	50.9	41.7	53.7	43.9	41.9	55	24.6	55	53.7	108.7
6	Gagliano, Victor	2110081	34.4	31.60	35	5.3	28.9	31.5	37.7	14.84	20.8	37.7	35	72.7
7	Johnson, T.E.	2016707	28.6	31.90	29.6							31.9	29.6	61.5
8	Thomas, Mike	2615041	5.9	23.50	4.2	23.4	24.3	3.4				24.3	23.5	47.8
	Eberle, Rob	411592												DNF
	Nishanian, Peter	2589485												DNF
	Surtees, Leonard	2587511												DNF
						FINAL SCORES								

USIC 1998 STD. CLASS CAT GLIDER # 218

	CONTESTANT	AMA NO.	FL 1	FL 2	FL 3	FL 4	FL 5	FL 6	FL 7	FL 8	FL 9	BEST FLIGHT	2ND BEST FLIGHT	TOTAL 2 BEST FLTS
1	Von Bueren, Karl	2051477	83.4	83.6	79.9	72.7	82	80.7	28.7	82.2	81.6	83.9	83.6	167.5
2	Warmann, Robert	2018748	74.6	76.8	81.4	81.2	79.4	16	DNF	DNF	DNF	81.4	81.2	162.6
3	Schlarb , Ralph	2322352	80.1	77.5	78.8	79.1	80.3	32	DNF	DNF	DNF	80.3	80.1	160.4
4	Schlarb, W. L.	2014425	77.5	76.4	78.1	DNF	DNF	DNF	DNF	DNF	DNF	78.1	77.5	155.6
5	Cawthorne, John	2560561	72.4	75.6	76.6	69.7	77	75.6	72.6	74.1	73.5	77	76.6	153.6
	Fulmer, Keith	2031552	74.2	75.1	70.5	73.1	77.4	74.9	DNF	DNF	DNF	74.4	75.1	152.5
	Person, Lee	2383504	71.5	70.9	72.7	71.3	71.4	74.6	69.2	69.3	74.5	74.6	74.5	151.1
	Marett, John	651L	67.2	73.5	68.6	69.2	74.3	66.9	67.3	73.4	74.7	74.7	74.3	149
	Romash, Robert	2130061	73.8	74.6	73.8	DNF	DNF	DNF	DNF	DNF	DNF	74.6	73.8	148.4
	Diebolt, John	97263	53.2	69.8	69.9	65.8	68.1	75	71	69.4	70.7	75	71	146
	Belleft, Dan	12816	60.1	72.3	71.4	64.9	64.2	DNF	DNF	DNF	DNF	72.3	71.4	143.7
	Miller, Richard	2179518	58.3	22.7	1	62	62	51	59.6	39.4	63.3	63.3	62	125.3
	Doig, Richard	2005392	43.1	60.3	61.9	54.2	51.5	11	55.3	52.8	56.3	61.9	60.3	122.2
	Johnson, T.E.	2016707	41.2	53.4	53.8	35.1	51.7	46	DNF	DNF	DNF	53.8	53.4	107.2
	Vandover, Abram	2000894	35.9	5.4	33.4	43.7	47.9	34.5	40.5	36.8	31.9	47.9	43.7	91.6
	Gagliano, Victor	2110081												DNF
	Cawthorne, J. Jr.	2560562												DNF
	Tenny, Bud													DNF
	Kelly, James R.	2037564												DNF
	Kimball, Bruce	2059849												DNF
	Nishanian, Peter	2589485												DNF
	Phillips, W. H.	2009088												DNF
	Rash, Fred	2063458												DNF
							FINAL SCORES							

USIC 1998 ROG STICK # 214

PLACE	CONTESTANT	AMA NO.	FLT 1	FLT 2	FLT 3	FLT 4	FLT 5	BEST FLIGHT
1	Loucka, Larry	2001210	19:51	20:19				20:19
2	Coslick, Larry	2004652	18:10	19:57				19:57
3	Sova, Tom	2473169	14:35	16:22	16:56			16:56
4	Thomas, Mike	2615041	15:02	9:50		3:43		15:02
5	Diebolt, H. J.	2097263	10:31					10:31
6	Kehr, Joe	2549294	3:05	7:18	8:31	8:44	9:27	9:27
7	Rash, Fred		6:46	6:39	7:52	7:32	8:49	8:49
8	Raymond-Jones, D.	2063358						DNF
9	Walton, Nick	2397340						DNF
				FINAL SCORES				

USIC 1998 BOSTONIAN # 215

PL	CONTESTANT	AMA NO.	FLT. 1	FLT. 2	FLT. 3	FLT. 4	FLT. 5	BEST 2 FLIGHTS	CHARISMA	TOTAL
1	Coslick, Larry	2004652	5:58	4:37	5:01	5:48		706	1.16	818.96
2	Thomas, Mike	2615041	4:46	5:32	5:11	5:39		671	1.12	751.52
3	Marett, John	2616261	4:41	5:01	5:03			604	1.13	682.52
4	Miller, Richard	2179518	4:41	5:13	4:19			594	1.14	677.16
5	Gardner, Steve		2:21	3:26	5:07	4:12	1:52	559	1.19	665.21
	Schutzel, Emil	2508384	4:13	2:40	4:37	3:58		530	1.15	609.5
	Diebolt, H.	2097261	2:39	4:11	2:37	4:18		509	1.18	600.62
	Barker, John	2002095	4:34	4:12	3:26			526	1.13	594.38
	Cawthorne, John	2560561	3:36	2:57	3:17	3:42	3:31	438	1.18	516.84
	Kent, Michael	2614477	3:34	3:55	3:26	3:37	3:46	461	1.04	479.44
	Krol, Greg		2:58	3:27				385	1.17	450.45
	Rash, Fred	2063458	2:53	3:14	0:47			367	1.1	403.7
	Grant, James B	2159477	3:11	2:31				342	1.15	393.3
	Von Bueren, Karl	2051477	2:13	2:08	2:08	:54		261	1.2	313.2
	Vandover, Abram	2000894	:46	:49				95	1.11	105.45
	Avery, Paul	2158011								DNF
	Bakay, Carl	2478659							1.16	DNF
	Warmann, Robert	2018748								DNF
					FINAL SCORES					

USIC 1998 KIT PLAN SCALE # 213

PLACE	CONTESTANT	AMA NO.	SUBJECT	PTS	MANSHIP	TOTAL	FLT	FLT	FLT	FLT. TOTAL	COLUMNS
1	MCGILLIVRAY, JACK	2615483	ARADO	58	36	94	1:33	1:52	1:55	188	282
2	MAC ENTEE, R.	2102085	DAPHINE	58	34	92	1:38	1:52		184	276
3	BLAIR, JOHN	2029698	FAIRCHILD RANGER	56	35	91	91	91		182	273
4	THOMAS, MIKE	2615041	TAYLORCRAFT	54	38	92	1:38	1:28		178	271
5	MILLER, RICHARD	2179518	HOWARD DG8-9	56	34	90	1:37	1:41		180	270
	GRANT, JAMES	2159477	TAYLORCRAFT D-57	52	35						
	MARTIN, JOHN	2000712									
	RAYMOND-JONES,D.C.	2063358									
			FINAL SCORES								

USIC 1998 FLYING RUBBER SCALE # 507

PL.	CONTESTANT	AMA NO.	SUBJECT	1	2	BEST FLIGHT	2ND FLIGHT	AVERAGEBEST TWO	TIME POINTS	SCALE POINTS
1	McGillivray, Jack	2615483	SE5 REPLICA	90	90	90	90	90	90	96
2	Blair, John	2029698	PORTERFIELD	52	33	52	33	42.5	42.5	96
							FINAL SCORES			

USIC 1998 PRO 20

	CONTESTANT	AMA NO.	Flt 1	Flt 2	Flt 3	Flt 4	Flt 5	Best Flight
1	Loucka, Larry	1210	27:39	29:12				29:12
2	Sova, Tom	473169	20:42	24:48				24:48
3	Slusarczyk, Chuck		16:06					16:06
				FINAL SCORES				

USIC 1998 LEGAL EAGLE

PLACE	CONTESTANT	SCORE
1	Schutzel, Emil	21:50
2	Obarski, Richard	16:59
3	MacEntee, Rich	10:02
	FINAL SCORES	

USIC 1998 MINI-STICK # 220

	CONTESTANT	AMA NO.	FLT 1	FLT 2	FLT 3	FLT 4	FLT 5	BEST FLIGHT
1	Slusarczyk, Donald	2005490	10:40	11:28	11:54			11:54
2	Thomas, Mike	2615041	8:28	9:30	11:36	11:50		11:50
3	Sova, Tom	2473169	10:39	5:00	11:12	11:47		11:47
4	Romash, Robert	2130061	11:21	10:43	11:08	10:09	9:50	11:21
5	Hardcastle, Richard	2000847	11:18	3:47				11:18
6	Barr, Laurie		10:19	10:50	3:12			10:50
7	Walton, Nick	2397340	10:07	5:24	6:27	10:37		10:37
	Olshefsky, Peter	2614476	10:27	8:35	8:51			10:27
	Diebolt, H.J.	2097263	8:49	8:59	10:17	1:46	9:32	10:17
	Hacker, Vernon	9000304	6:14	10:16	8:57			10:16
	Tellier, Fred	2615254	9:56	10:12				10:12
	Coslick, Larry	2004652	10:00	9:49				10:00
	Obarski, R.W.	2000560	9:35	9:59	8:33			9:59
	Von Bueren, Karl	2051477	8:35	8:22	9:24	9:51	8:06	9:51
	O'Grady, Dan	2614475	5:14	8:04	9:19	9:15		9:19
	Barker, John	2002095	7:59	9:06	8:54	4:21	7:43	9:06
	Van Gorder, Walt	2019912	9:05					9:05
	Singer, Len	2209081	6:32	5:29	7:56	8:26		8:26
	Martin, W.			6:44	7:51			7:51
	Cawthorne, John, Sr.	2560561	7:27	6:20				7:27
	Kehr, Joe	2549294	7:07	4:13	6:09	2:42	5:47	7:07
	Raymond-Jones, D.	2063358	6:50	6:37				6:50
	Tellier, Robert		6:10					6:10
	Miller, Richard	2179518	3:05					3:05
	Sullivan, Edward	2069585	2:47					2:47
	Clem, Jim	9000055		1:03				1:03
	Barber, Douglas	2056270						DNF
	Cailliau, Larry	2079985						DNF
	Cawthorne, John, Jr.	2560562						DNF
	Conner, Matthew	2615256						DNF
	Fellin, John	2095353						DNF
	Kelly, James	2037564						DNF
	Kimball, Bruce	2059849						DNF
	Landrum, Billie	2052674						DNF

	PLACE	CONTESTANT	AMA NO.	FLT 1	FLT 2	FLT 3	FLT 4	FLT 5
	Loucka, Larry	2001210						DNF
	Person, Lee	2383504						DNF
	Slusarczyk, Charles	2002643						DNF
	Smith, Philip	2345800						DNF
	Vallee, Thomas	2001126						DNF
	Warmann, Robert	2018748						DNF
					FINAL SCORES			

USIC 1998 UNLIMITED RUBBER SPEED

PLACE	CONTESTANT	AMA NO.	FLT 1	FLT 2	FLT 3	FLT 4	FLT 5	BEST FLIGHT
1	Coslick, Larry	4652	6.3	6.3				6.3
2-3	Diebolt, John	97263	9.3	7.7				9.3
2-3	Sova, Tom	473169	9.3	8.9	8.8	9.2		9.3
4	Cawthorne, John, Sr.	560561	11.8	10.6	11.9	10.7	9.8	11.9
5	Blair, John		15.2	9.6	8.1	8		15.2
	Hacker, Vernon							DNF
	Krol, Gregory							DNF
	Slusarczyk, Chuck							DNF
				FINAL SCORES				

FID-B

NAME	1	2	3	4	5	TOTAL	STAND-ING
Bernard Hunt	15:06	16:46	17:32	15:58		17:32	1
Laurie Barr	14:25	15:48	2:12	16:47	17:03	17:03	2
Joe Kehr	4:15	11:38	12:28	6:01	12:16	12:28	3
Billie Landrum	10:24	11:26	10:36			11:26	4
Tom Vallee	5:36	9:12	5:47	8:31	10:40	10:40	5
Chuck Wrzos	5:04					5:04	6

USIC 1998 DIME SCALE

PLACE	CONTESTANT	AIRCRAFT	SCORE
1	McGillivray, Jack	COMET ARADO	7:05
2	Hardcastle, Dick	COMET FOKKER DVII	6:03
3	Miller, Richard	VAGABOND	5:02
4	Martin, "Doc"	MEGOW CURTISS SEAMEN	4:58
5	Blair, John	CHESTER JEEP	4:38
6	Blair, John	CONSOLIDATED BT-7	4:36
7	Thomas, Mike	EZBUILT TAYLORCRAFT	4:23
8	Hiscock, Bill	COMET SPAD	1:39
		FINAL SCORES	

Limited Pennyplane, Junior

Name	1st	2nd	3rd	4th	5th	best	Rank
Stevens, Robert	9:56	11:22	11:35			11:35	1st
Connor, Marcus	10:02	11:03	2:21			11:03	2nd
Victory, Stephanie	5:07	11:01				11:01	3rd
Boyd, Michelle	6:57	8:32	10:25	7:17	9:54	10:25	4th
Smith, Jennifer	9:01	7:53	10:04			10:04	5th
Crow, Adam	8:10	8:40	8:12	9:14		9:14	6th
Anderson, Patrick	7:14	8:29	4:03			8:29	7th
Spaldling, Nikki	7:20	5:34				7:20	8th
Anderson, Karen	6:10	6:42				6:42	9th

No Cal Scale, Junior

Name	1st	2nd	3rd	best	rank
Conner, Matthew	3:30	2:32	1:50	3:30	1st
Anderson, Karen	2:34	2:35	2:45	2:45	2nd
Anderson, Patrick	1:50	1:59	2:14	2:14	3rd
Anderson, Patrick	2:00	2:12	1:51	2:12	4th
Victory, Stephanie	1:48	1:27	2:00	2:00	5th
Crow, Adam	1:23	1:40	1:23	1:40	6th

Bostonian, Junior

Name	Total	Charisma	Time (sec)	Rank
Smith, Jennifer	274	1.09	252	1st
Stevens, Robert	203	1.03	198	2nd
Anderson, Karen	176	1.02	173	3rd
McCord, Adam	174	1.07	163	4th
Lee, Hunter	153	1.06	145	5th
Jones, Daniel	153	1.08	142	6th
Crow, Adam	149	1.05	138	7th
Anderson, Patrick	133	1.01	132	8th

Coconut Scale, Junior

Name	Time	Scale Rank	Time Points	Rank
Boyd, Michelle General Aristocrat	2:51	1	1	1st
Stevens, Robert Lockheed Vega	1:51	2	2	2nd
Conners, Marcus Evans Volksplane	1:27	3	3	3rd

USIC 1998 F.R.O.G.

PLACE	CONTESTANT	AMA NO.	Flt 1	Flt 2	Flt 3	Flt 4	Flt 5	Best Flight
	Sova, Tom	473169	7:48	7:20	7:38			7:48
	Diebolt, John	97263	6:08	6:27	3:16			6:27
	Rash, Fred	63458	5:46	6:20	1:40	6:02		6:20
	Ripley, Edward	484619	5:51	3:55	1:11	5:58	5:58	5:58
	Clem, Jim	L-55	1:53	2:56				2:56
	Bakey, Carl	478659						DNF
	Henderson, Neal							DNF
	Smith, Phillip	345800						DNF
	Warmann, Robert C.	397340						DNF
				FINAL SCORES				

USIC 1998 PEANUT SCALE # 505

PLACE	CONTESTANT	AMA NO.	AIRCRAFT	FLIGHT 1	FLIGHT 2	FLIGHT 3	FLIGHT POINTS	SCALE POINTS	TOTAL POINTS
1	Thomas, Mike	2615041	VOISIN	1:54	2:04	2:06	113	129.6	248.6
2	McGillivray, Jack	2615483	VOISIN	1:24	1:19		81.5	128.8	210.3
3	Mac Entee, Richard	2102085	LEMBERGER	1:34	1:39		96.5	82.4	178.9
	Romash, Robert	2130061	BERKUT	1:00	0:44	0:50	55	84	139
	Odel, Bill		DAVIS	:21	:22		21	60	81
	Martin, John	2000712	ANSALDO		DNF			71.05	
	Cawthorne, John	2560562			DNF				
				FINAL SCORES					

USIC 1998 NO-CAL SCALE

PL.	CONTESTANT	AMA NO.	Flight 1	Flight 2	Flight 3	Flight 4	Flight 5	Best Flight
1	Thomas, Mike	MAAC1964	6:09	6:55	7:50			7:50
2	Slusarczyk, Chuck		6:29	6:38	6:36	6:40	7:17	7:17
3	Diebolt, John	97263	4:35	2:53	6:58	6:50		6:58
	Slusarczbyk, Don	5420	6:21	6:14	4:43	6:51	6:36	6:51
	Oberski, Richard	560	6:07	6:42	4:41	6:47		6:42
	Van Buren, Karl	51477	3:49	0:35	4:11	6:20	3:06	6:20
	Kehr, Joe	649294	4:20	5:15	5:08	5:04	5:18	5:18
	Rash, Fred	63458	4:36	4:54				4:54
	Nuszer, Joseph	29036	4:25					4:25
	Brownhill, Chris	MAAC 3797-L	3:53	3:52	3:47	3:10	4:04	4:04
	Cawthorne, John, Jr.	560562	1:41	3:11	3:22			3:22
	Cawthorne, John, Sr.	560561	2:49	2:48				2:49
	Warmann, Robert C.	397340						DNF
	Savage, Tom	613003						DNF
	Plassman, Gerald	107613						DNF
	Person, Lee	383504						DNF
	Oleson, Doug	480646						DNF
	MacEntee, Richard	102085						DNF
	Loucka, Larry	1210						DNF
	Landrum, Billie	52674						DNF
	Kelly, Jim	37564						DNF
	Italiano, Tony	2386						DNF
	Boone, Jack	107857						DNF
				FINAL SCORES				

USIC 1998 35 CM

PL.	CONTESTANT	AMA NO.	FLT. 1	FLT.2	FLT. 3	FLT. 4	FLT. 5	BEST FLT.
1	Barr, Laurie		23;32					23:32
2	Sova, Tom	473169	6:24	20:01	19:16	20:55	18:42	20:55
3	O'Grady, Dan	F57	18:30	19:50				19:50
4	Vallee, Thomas	1126	12:13	18:41	13:38	7:18		18:41
5	Raymond-Jones, D.	MAAC13157	11:25	16:05				16:05
6	Romash, Rob	130061	15:59	16:02				16:02
	Nuszer, Joseph	29036	15:50	10:04	10:32			15:50
	Olshefsky, Peter	MAAC864L	13:59	13:24				13:59
	Zufelt, J.		6:51	6:24	10:34	13:46		13:46
	Landrum, Billie	52674	11:30	11:08				11:30
	Warmann, Robert C.	397340						
	Grant, James B.	159477						
	Diebolt, John	97263						
	Fellin, John	95353						
	Slusarczyk, Chuck							
				FINAL SCORES				

USIC 1998 ORNITHOPTER # 210

PLACE	CONTESTANT	AMA NO.	FLT 1	FLT 2	FLT 3	FLT 4	BEST FLIGHT
1	Coslick, Larry	4652	14:35				14:35
2	Ripley, Ed	2484619	3:48	13:06	14:15	4:58	14:15
3	Thomas, Mike	2615041	9:14	13:02	3:08	2:41	13:02
4	Diebolt, H. J.	2097263	5:15				5:15
	Joshu, Eugene	2260643					DNF
				FINAL SCORE			

USIC 1998 PIONEER

PL.	CONTESTANT	PLANE	FLT.					
	MacEntee, Richard		56					
			FINAL SCORE					

Proposed Scheduling Change For the 1999 USIC

Practice Session

Some of you have flown in the International EZB contest held at the Kibbie Dome in Moscow Idaho. It's a very popular event on the West Coast. Wally Miller and Larry Coslick would like to bring it to Johnson City in 1999. With only a few changes in the current schedule, it could be done. Compare the two practice schedules.

Practice Schedule USIC 1998

7:30	10:00	12:00	2:00	3:00	5:00	7:00	10:00
Practice 1998	IHLG STD CAT GLD UNL CAT GLD UNL RBR SPD	ALL SCALE EVENTS FAC & AMA PLUS NO-CAL	P. PLANE UNL P. PLANE MANHATTAN AUTOGYRO	P-24 MASS LAUNCH	MINI-STICK ORNITHOPTER HELICOPTER	INT STICK ROG STICK EZ-B PRO-20	F1D HL STICK 35 CM CABIN ROG

Revised Practice Schedule, USIC 1999

7:00	9:00	11:00	1:00	2:30	4:30	6:00	10:00
Proposed Schedule 1999	IHLG STD CAT GLD UNL CAT GLD UNL RBR SPD	ALL SCALE EVENTS PLUS NO-CAL BOSTONIAN P-24 MASS L	P. PLANE UNL P. PLANE MANHATTAN AUTOGYRO	MINI-STICK ORNITHOPTER HELICOPTER	INT. STK ROG STK EZB 35CM	F1D HLS CABIN ROG PRO 20	START COMPETITION FOR F1D HLS CABIN ROG

If F1D fliers need more practice time there is plenty of room at the end of the dome for ¼ and ½ motor flying. This can be done during the midday practice session.

35 CM and autogyro need to be moved to another time slot away from F1D. These modelers are not compatible with the slow flying F1D and HLS. There was a lot of concern about mid-air collisions with these models. With F1D starting Wednesday evening and winding up Thursday evening, this opens up the Saturday evening time slot. This is where the INT. EZB could be flown. This event is flown according to AMA rules but it is flown in rounds. The best two of five flights determines the winner.

Cezar Bank's F1D Box
Construction notes

1. Build four frames out of ½" x ¾" pine, laying one over the other to make sure that they are as identical as possible. It is more important to make them match each other than to get an exact dimension. Outside dimensions of the frames minus 1 ¼" equals the inner dimensions. My frames O.D.s are 36" x 24" ½" 12 ½". The drawings show lap joints; miter joints are O.K. too.

2. Cut two 1/8" think mahogany plysheets to match the frames O.D. Glue these to two of the frames to make the two swinging doors. These sheets will be on the outside of the doors. On the inside of these sheets are the gadgets and fixtures that you will use to hold the models.

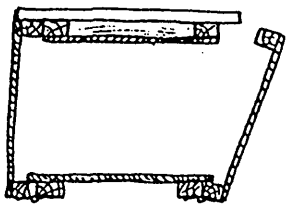
3. Cut the floor and end pieces from 1/8" mahogany ply. These are cut to the inside dimensions of the remaining frames by the width of the desired box plus 3/8". This allows the pieces to be glued inside the frames with a 3/16" lip on both sides for the doors to fit onto. This results in a very stiff box when it is closed. It can be made stronger still by the inclusion of ¾" gussets bracing the end pieces to the floor. These help keep the box stiff when it is open.

4. Choose a handle, then install two 1 ½" x ½" pine handle braces spaced to fit the chosen handle flush between the top frames of the box. A 1/8" plate is added to the bottom of these handles braces to form a small tray handy for holding items used while flying. Two more 1 ½" x ½" pine pieces are added flush between the top frames at the ends of the box. Cut two top panels from 3/16" Plexiglas to fit the top of the box from each handle brace to the end pieces. Make Plexiglas same width as the box O.D. with doors closed. They also form a lip to match the doors. Attach the Plexiglas using brass screws. Add the handle.

5. Use two brass hinges, 1" – 2" long, on each door on the bottom of the frames. To allow the doors to open within scraping whatever the box is resting on mount four rubber or plastic stand offs on the bottom of the box. These will also keep the bottom of the box from picking up dirt. Add the various meter, scale, and winder mounts to the top along with a "peel and stick" ruler and any winding charts or conversion tables you like. To lock door, use two champfer-head screws (6-32 or 8-32) per door at top to go into captured nuts. Undo the screws to open door.

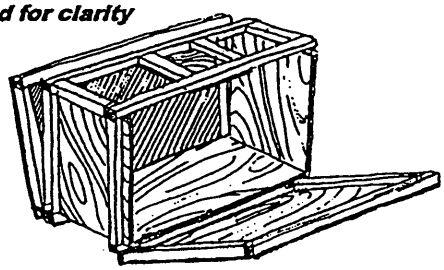
6. **IMPORTANT**; For airline travel, make a "surround box" out of foam/vinyl. Buy the following from your local Upholstery-Fabric store. Buy foam sheeting one inch thick and 2-2 ½ lb. Density. Form the box, glue with contact cement or similar. Cover foam box with .040 - .060 thick upholstery vinyl to outside of foam box. Add "Fragile-Delicate Instrument" lettering. Vent holes should be drilled into the box ends at the top to prevent pressure differences from "popping" the box when the airliner changes altitude.

Cezar Banks' F1D Box

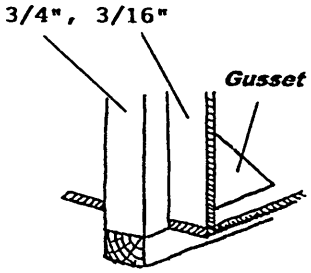


Crossection through box at tray

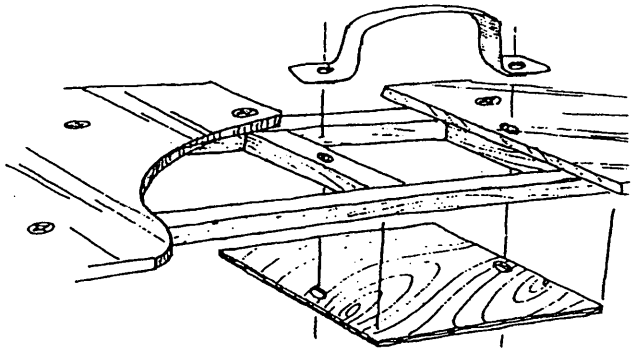
Plexiglas and handle omitted for clarity



Box Detail



Box center "lip" detail



Handle detail

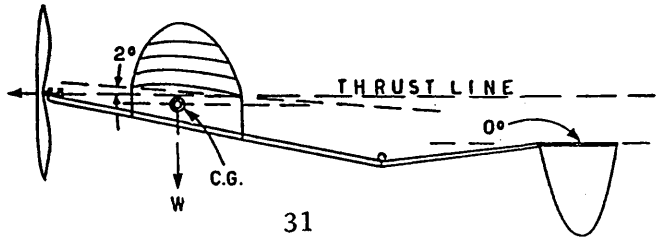
DRAWINGS NOT TO SCALE

Attention FAC Fliers

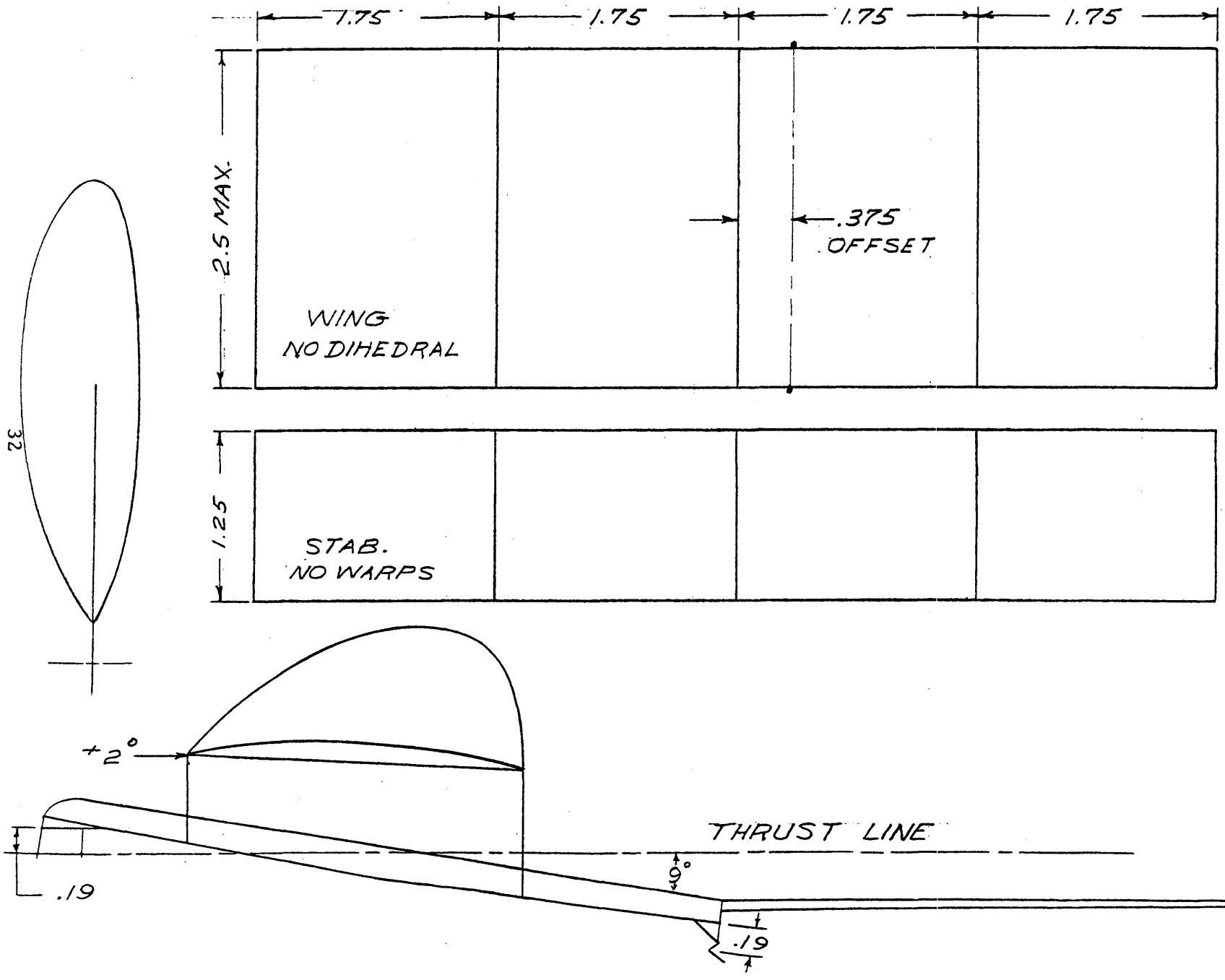
This message is for those FAC fliers that attended the 1998 USIC at Johnson City this May. For some unknown reason, we did not get your flight scores. We apologize and will post the scores in our next issue.

The "Cobra" - Why? and How

Because of the tremendous torque problems I have with mini-sticks, I was looking for some design change that might help the problem. I knew that FF Power models also have that problem, so I got out the 1992 NFFS Book on Power Models, by Keith K. Hoover and studied the very high thrust line designs. I could not quite work out a usable configuration for a mini-stick when I remembered a layout in the 1941 book Model Airplane Design and Theory of Flight, by Charles Hampson Grant, in which he said if you put the thrust line above the Center of Gravity it would solve the problem I had been having. Below is a sketch from Charlie's book that shows this force diagram. It does not completely solve the launch torque problem, but does allow you to launch with considerably more torque. In cruise, the model assumes a beautiful "on the step" attitude. Last but not least, when the model is descending you can tell it is your airplane because of its characteristic "banana" shape!



ANDREW TAGLIAFICO WING & STAB.



"COBRA"
A MIINI STICK
SIXTH PLACE
97' NATS - 11:39
BY
JIM CLEM

MODEL NAME COBRA MINI STICK BUILDER JIM CLEM

MOTOR STICK SOLID

Density # 5 Grain A Length 5" Front, Width .070

Height .115 Center, W. .115 H. .146 Rear, W. .070 H. .115

Cut Weight _____ Finished Weight .14 GM. Special Instructions _____

WT. COMPLETE STICK - .14 GM.

Thrust Bearing, Wire size _____ Other HARLAN BEAR. Web. Density _____

Thickness _____ Rear Hook .010 Web. Density #5

Thickness .020 Paper Tubes. Material Used JAP TISSUE

Adhesive Used AMBROID--50/50 Special Instructions 6 DROPS TOF PER OZ.

WING

Leading Edge Spar. Density #5 Grain A Length 7" Width .030

Height .045 Weight _____ Trailing Edge Spar. Density #5 Grain A

L. 7" H. .045 W. .030 Weight _____ Tips. Density _____

Grain _____ Tip at L/E. Width _____ Height _____ Tip at T/E. Width _____

Height _____ Weight for 2 Tips. _____ Ribs Standard. Density #5

Grain C W. .025 H. .035 Weight Ea. _____

Wing Posts Density #5.5 Grain A L. _____ W. .050ϕ H. _____

Wing Covered _____ Wing Weight Complete. .12 GM Special Instructions

STAB

Outline. Density #5 Grain A Leading Edge Center, W. .025

H. .030 Tip. W. .025 H. .030 Trailing Edge Center, W. .025

H. .030 Ribs. Density #4.5 Grain C W. .022 H. .030

FIN

Fin, Not Floating. Density #4.5 Grain A W. .025

H. .030 Weight Dry, _____ Weight Covered. .05 GM.

MODEL NAME "COBRA" MINI STICK BUILDER JIM CLEM

Prop Spar. Density BASS WOOD Grain _____ Spar Length 4"

Dimensions at prop shaft, W. .030 H. .030 Dimensions at Tip.

W. .030 H. .030 Spar Weight. _____ Prop Shaft

Wire Size. .010

Prop, Wood Blades

Blades. Density #4.5 Grain C Blades Area, Ea. 2.06 SQ. IN.

Blade Thickness .012 Weight for 2 Blades _____

Give prop pitch at 45 degrees and one inch from tip. Pitch at 45 degree 14" Pitch 1 inch

From tip. 14". If V/P, Low pitch _____ High pitch _____

If V/D, Diameter when extended _____ Diameter when folded _____

Speical Instructions on prop construction MOUNT PROP SHAFT ON .045X.045X.500 6#
PROP COMPLETE WEIGHS .11 GM.

RUBBER

Loop Length 13" Width .025 Rubber Vintage, Month and Year

8/93. Weight of Loop. .48 GM. .01702. Turns 2790

Back off Turns. _____ Launch Torque in inch ounces. .1 Turns Left 0

Do you use O rings. Yes. YES No. _____

TRIM

Wash In, Wing Left panel .062 Wash Out Left panel. _____

Wash Out, Right panel _____ Wash In, Right panel _____

Wash In Stab, Yes _____ No _____ How Much _____

Down Thrust. _____ Left Thrust. 4° Special trim instructions.

KIBBIE DOME

DOUBLE HEADER / 1998

ANNUAL - AUG.1 THRU 3 • EZB INTERNATIONAL - AUG. 4

UNIVERSITY OF IDAHO, MOSCOW, IDAHO

KIBBIE DOME OPEN FOR FLYING - 8:00 AM TO 8:00 PM

MEET 1. (August 1,2&3) **Kibbie Dome Annual.**

All AMA Official Indoor Events. Six official flights per event (which can be flown any time all three days - 9:30 AM to 8:00 PM)
Hand Launched Glider and Catapult Glider flights 8:00 AM to 9:30 AM only, all three days. Nine (9) official flights allowed.

SPECIAL EVENTS: Pro-20, Novice EZB, P-24, A-6, and NON-RADIO CONTROLLED ELECTRIC F.F. (30 gram max weight for ELECTRIC F.F.)
ENTRY FEE: Open & Senior - $50.00. Junior Flyers - $25.00
Table and 2-chairs rental: $5.00
There are no additional event charges.
CONTEST DIRECTOR: Andrew Tagliafico, Call (503) 452-0546 for additional information. Modest Prizes will be given.
SCALE CONTEST DIRECTOR: (for A.M.A. Scale and Peanut Scale events) Ed Lamb. Call (206)747-7806 for information. The static scale judging will take place prior to flying.

MEET 2. (August 4) **The Wally Miller International EZB Contest.**

Six rounds to be flown from 8:00 AM to 8:00 PM. All AMA rules governing EZB models to be observed. Timer volunteers are welcome.

NEW THIS YEAR: Novice EZB classification added to this event only. A novice is one who has not exceeded an 18-minute EZB flight.
ENTRY FEE: $40.00 for each flyer participating. (Junior, Senior and Open combined).
NOVICE ENTRY FEE: $20.00 (Junior, Senior and Open combined).
CONTEST DIRECTORS: Wally Miller and Larry Coslick.

Modelers with cars must stop at University Visitor Information Center, 645 W. Pullman Road (across from Hardee's Rest.) to obtain a visitor's parking permit. Cost is approximately $2.00

Indoor ***Issue #95***
November, 1998

News and Views

World Championships

INDOOR NEWS AND VIEWS (INAV) IS PRODUCED IN ST LOUIS BY LARRY COSLICK, GENE JOSHU, HOWARD HENDERSON, BILL MARTIN, STEVE GARDNER, AND ROY WHITE

INAV DUES ARE

U.S.	$: 9.00/year
Canada	$12.00/year
Other (air mail)	$15.00/year

4 to 6 issues/year depending on budget and availability of material

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U.S. — $3.25 per issue (including postage)
Overseas — $5.35 per issue (including postage)

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Send all mail to this new address:
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Phone: 314-822-3980

(INAV) can be reached via computer E-mail at the following addresses:
AEROBAT77@ AOL.COM (Steve Gardner)
H PIET H@AOL.COM (Howard Henderson)

THE PRODUCERS ARE LOOKING FOR VOLUNTEERS TO TAKE OVER PUBLICATION OF INAV. ANYONE INTERESTED SHOULD CONTACT HOWARD HENDERSON.

INAV subscribers were most generous
In helping finance the USA Junior entry to
The World Championships this year

We at INAV have received a total of $3750.00 (including a matching grant of $850.00) for the funding of the USA Junior Participants in this years World Championships. Nick Leonard received $1102.25 he needed to attend.

The balance of the funds contributed ($2644.75 as of 10-29-98) will be held for future Junior competition support on the national or international level.

We at INAV wish to thank you all for your spectacular support of the USA Junior effort.

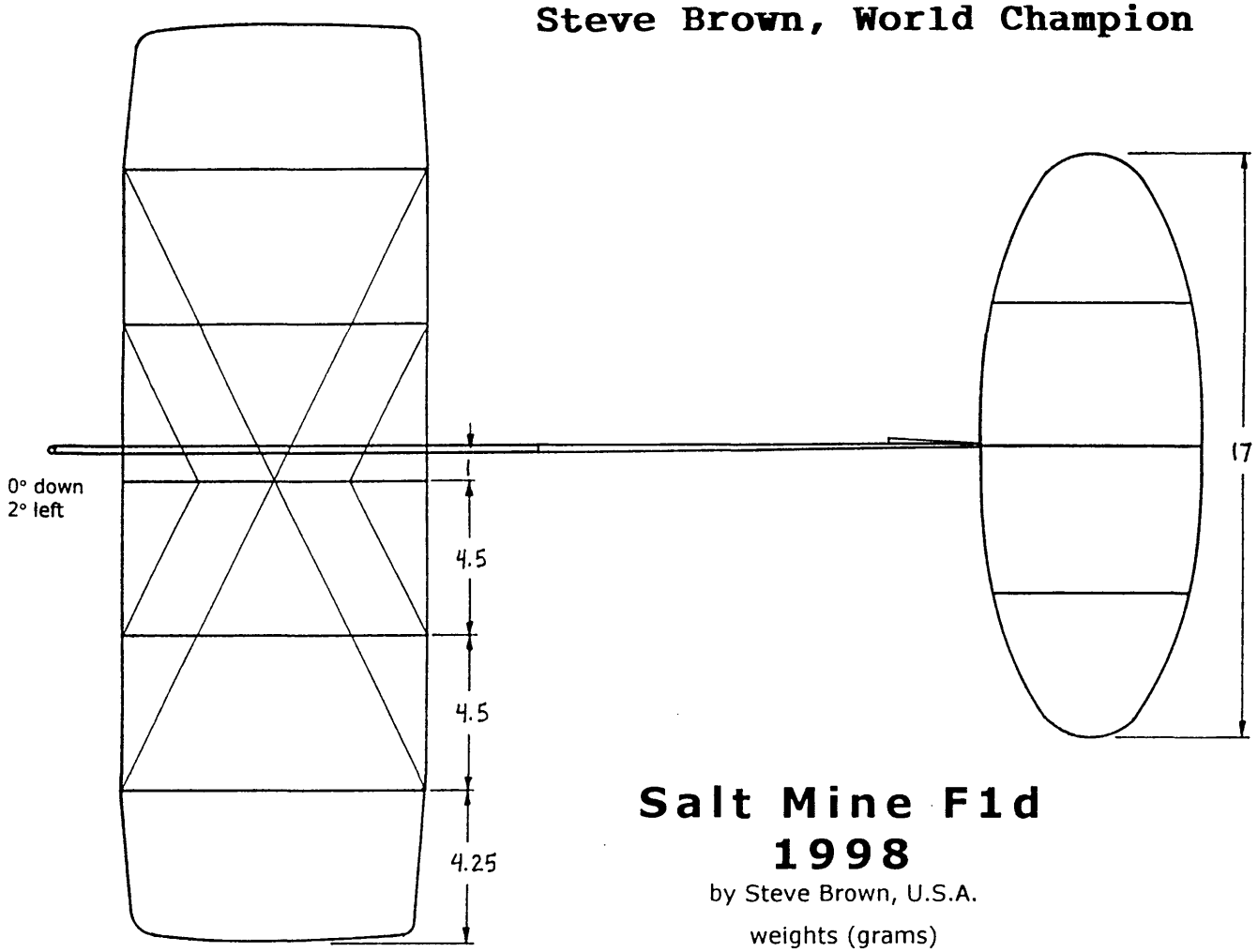
October 26, 1998

I would like to thank those who donated to the F1D Junior Team Fund. It allowed me to go to the World Champs in Romania, which has been a highlight of my life. Although the AMA does not set aside funds for juniors, it is rather touching to see that the modelers take care of each other. I especially want to thank the people behind INAV, Larry Coslick, Howard Henderson, Steve Gardner, and Gene Joshu for the effort that they took upon themselves to help raise money for the fund. Without their help the trip may not have been possible. I also wish to thank Dr. Vernon Hacker for the effort he put into the Junior fund. He sent many letters to AMA and is a prime reason that it was established in the first place. Lastly I would like to thank those at AMA for deciding to create it, and NFFS for deciding to manage it. I am glad that finally there is a program set up for juniors competing in F1D. I hope that in the future it will be unusual when no junior is representing the US at the worlds rather than the other way around. I am very happy to be involved in F1D, but what makes this obsession so special are the people involved. Thank you.

Sincerely,

Nick Leonard, Jr.

Steve Brown, World Champion

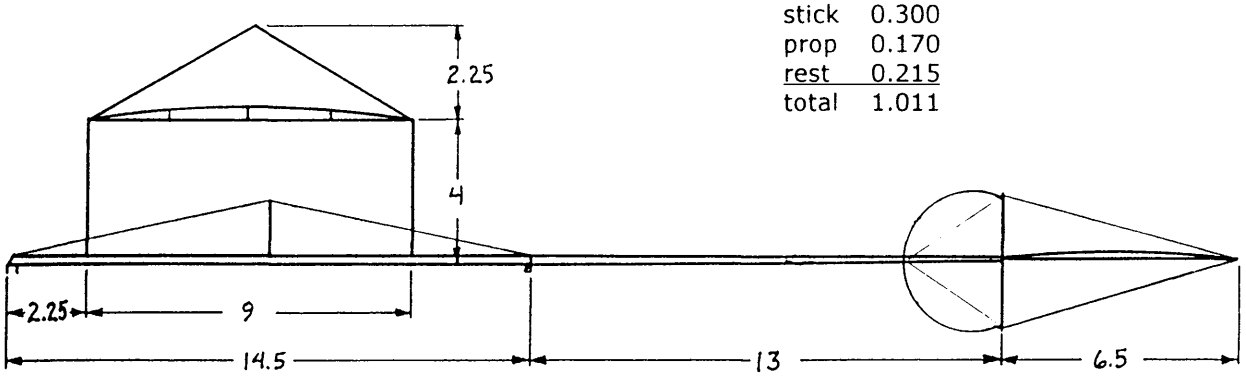


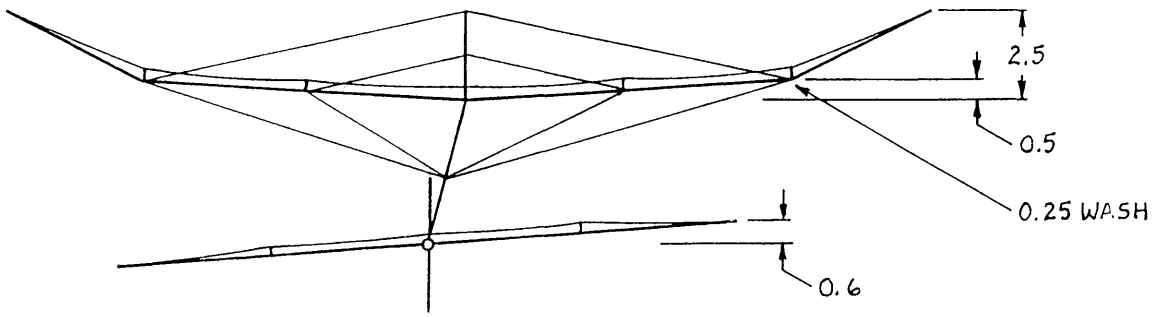
Salt Mine F1d
1998

by Steve Brown, U.S.A.

weights (grams)

wing	0.326
stick	0.300
prop	0.170
rest	0.215
total	1.011





Wing

spars	.034 X .044 6.0 lb.
tips	.030 X .038 5.1 lb.
middle ribs (3)	.027 X .044 5.3 lb.
compression ribs (2)	
top:	.027 X .030 5.3 lb.
bottom:	.035 X .024 5.0 lb.
uprights:	.004 boron
wingposts	.035 X .055 → .030 X .040 6.0 lb.
	(3) .003 boron
cabane	.030 X .045 → .030 X .035 5.2 lb.
bracing	.0003 tungsten
airfoil	3.5% ellipse

Stabilizer

spars	.028 X .048 → .022 X .032 5.5 lb.
center rib	.027 X .042 5.3 lb.
outer ribs	.024 X .032 5.2 lb.
bracing	.0003 tungsten to center rib
airfoil	2% arc

Fin

post	.028 X .050 → .028 X .040 5.5 lb.
outline	.004 boron

Motorstick

tube	.013 4.0 lb. (4) .004 boron
webs	.018 4.5 lb.
cap	.013 4.0 lb.
bracing post	.045 X .045 → .035 X .035 X 1.75 7.0 lb.
hook	.013 music wire
bearing	Harlan F1d
bracing	(1) .001 tungsten

Boom

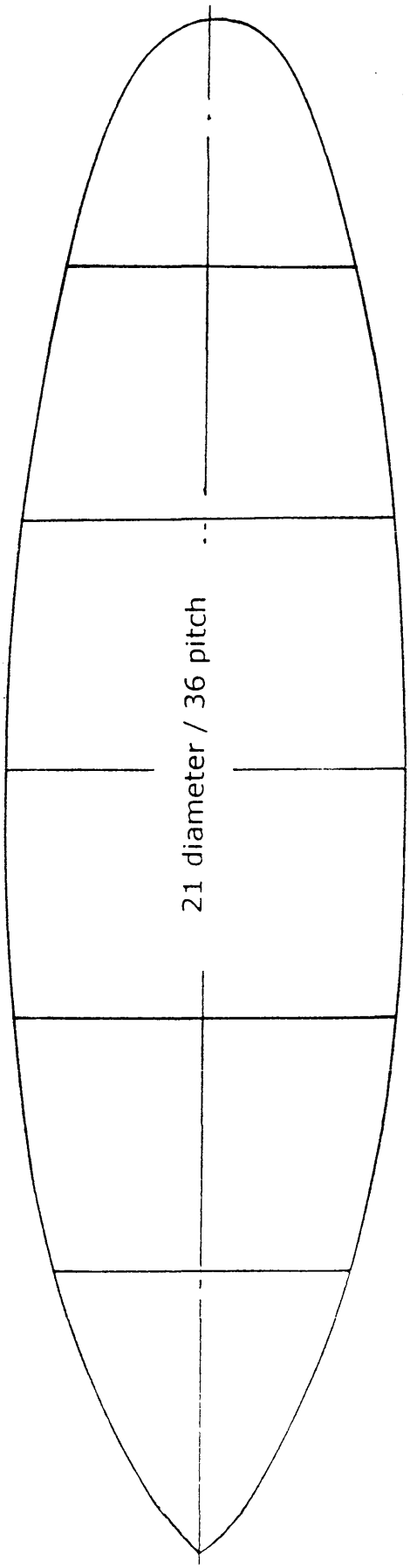
tube	.008 4.0 lb. .230 i.d. → .160 i.d.

Propeller

spars	.068 X .072 → .028 X .028 5.5 lb.
outline	.025 X .025 4.5 lb.
ribs	.022 X .025 4.5 lb.

Motor

.043 X .078 X 16.5 = 1.70gm, July 1997 Tan II
2010 launch turns - 0 remaining = 2010 used
44.5 RPM average



F1D INDOOR WORLD CHAMPIONSHIP
Slanic-Prahova, Romania, 13 Oct.- 15 Oct. 1998

Final Results - SENIORS

INDIVIDUAL RESULTS FOR ALL COMPETITORS

Place	#	Name	Cntry	Rnd 1	Rnd 2	Rnd 3	Rnd 4	Rnd 5	Rnd 6	Total
1	11	BROWN STEVE	WCH	40:45	43:52	45:11	44: 4	12:18	43: 8	89:15
2	19	REE ANDRAS	HUN	40:37	43:40	45:13	42:37	43: 8	12:43	88:53
3	27	RICHMOND JIM	USA	13:24	41:37	43: 7	12:22	39:33	44:21	87:28
4	40	TIPPER JOHN	GBR	35: 6	24:35	37:35	40:25	43:11	39: 0	83:36
5	41	BAILEY ROBIN	GBR	37:44	36:22	26:10	34:28	40:20	42:28	82:48
6	45	NICOARA VASILE	ROM	40:24	40: 5	41:46	13: 2	26:50	12:19	82:10
7	29	COSLICK LARRY	USA	14:37	30:29	41: 1	40: 0	34: 4	37:48	81: 1
8	7	NORE PENTTI	FIN	37:33	11:50	39:29	39:20	0: 0	1:57	78:49
9	4	ENOMOTO HIDEYO	JPN	38:38	33:39	32:46	34:24	39:57	37:30	78:35
10	15	ORSOVAI DEZSO	HUN	13: 6	37:31	37:58	14:25	39:50	38:30	78:20
11	18	BAKOS FERENC	HUN	7:31	37:11	38:13	39:32	32: 4	38: 9	77:45
12	1	KELLER PETER	SUI	32:28	1:33	37:39	38: 8	38:12	33:36	76:20
13	28	RANDOLPH BOB	USA	32:35	37:17	37:11	17: 3	0:18	28:33	74:28
14	30	CHAMPION ROBERT	FRA	36:19	11:16	38: 0	3:26	24:24	19:58	74:19
15	20	DIHM JAN	POL	16:32	36: 0	37: 2	34:15	36:59	32:18	74: 1
16	42	RICHARDS DEREK	GBR	31:57	31: 7	36:55	37: 6	34:58	33:38	74: 1
17	25	CIAPALA EDWARD	POL	37:41	35:31	35:53	36:13	35:22	24:40	73:54
18	43	POPA AUREL	ROM	36: 3	35:12	30:56	32:23	31:56	6: 9	71:15
19	2	LIEM EDMUND	CAN	17:30	0: 0	34:52	35: 3	29:52	32:39	69:55
20	44	MANGALEA CORNEL	ROM	24:19	34: 5	33:11	25:35	32:37	1:10	67:16
21	33	FRUGOLI FRANCIS	FRA	29:15	28:45	30:56	20:45	33:25	30:01	64:21
22	31	STEPONENAS RIMAS	LAT	22:59	25:48	22:28	28:55	29:41	0: 0	58:36
23	5	ENGLUND LEIF	FIN	11: 9	31:13	0:24	1:53	20:21	26:13	57:26
24	34	COGNET GUY	FRA	21:32	24:42	23:41	20: 9	31:58	25:27	57:25
25	35	SALOGUBOVAS VIT.	LAT	19:50	19:25	23:31	24:21	21: 0	24: 7	48:28
26	36	MOSIN VLADIMIR	LAT	13:41	16: 2	17:50	20:27	20:17	22:52	43:19
27	6	EROFEJEFF HARRO	FIN	21: 1	11:46	19:42	18:38	18: 4	19:46	40:47

F1D INDOOR WORLD CHAMPIONSHIP
Slanic-Prahova, Romania, 13 Oct.- 15 Oct.1998

Final Results - SENIORS

TEAM STANDINGS

Place	Country	Team		Team Score
1	HUN	Team Manager: Ree Andras		
		BAKOS FERENC	77:45	
		ORSOVAI DEZSO	78:20	
		REE ANDRAS	88:53	
				244:58
2	USA	Team Manager: Bud Romak		
		RANDOLPH BOB	74:28	
		COSLICK LARRY	81: 1	
		RICHMOND JIM	87:28	
				242:57
3	GBR	Team Manager: Colling Michael		
		RICHARDS DEREK	74: 1	
		BAILEY ROBIN	82:48	
		TIPPER JOHN	83:36	
				240:25
4	ROM	Team Manager: Morar Aurel		
		MANGALEA CORNEL	67:16	
		POPA AUREL	71:15	
		NICOARA VASILE	82:10	
				220:41
5	FRA	Team Manager: Champion Robert		
		COGNET GUY	57:25	
		FRUGOLI JEAN FRANCIS	64:21	
		CHAMPION ROBERT	74:19	
				196: 5
6	FIN	Team Manager: Englund Leif		
		EROFEJEFF HARRO	40:47	
		ENGLUND LEIF	57:26	
		NORE PENTTI	78:49	
				177: 2
7	LAT	Team Manager: Steponenas Rimas		
		MOSIN VLADIMIR	43:19	
		SALOGUBOVAS VITALIJU	48:28	
		STEPONENAS RIMAS	58:36	
				150:23
8	POL	Team Manager: Dihm Jan		
		CIAPALA EDWARD	73:54	
		DIHM JAN	74: 1	
				147:55
9	WCH	Team Manager: Bud Romak		
		BROWN STEVE	89:15	
				89:15
10	JPN	Team Manager: Enomoto Hideaki		
		ENOMOTO HIDEYO	78:35	
				78:35
11	SUI	Team Manager:		
		KELLER PETER	76:20	
				76:20
12	CAN	Team Manager:		
		LIEM EDMUND	69:55	
				69:55

Report on F1D Junior World Championships
Slanic, Romania
By: Nick Leonard, Jr.

Dad and I arrived with the other US team members in Bucharest; bleary-eyed and tired. We both had, collectively, seven Stork type F1Ds (Bernard Hunt's new tall post wonders) which had the extreme advantage of unbraced models- we fit all seven in two carry-on sized boxes. The traveling part of this operation could have gone better: the Storks arrived unharmed, but Steve Brown and Bob Randolph both suffered damage despite Lufthansa's special handling. In fact, Larry Coslick's box didn't even arrive with our flight into Bucharest and was said to have been damaged. This was terrible news but could not be helped that day; Lufthansa would send it along with another flight on the following day, which was practice day.

The Elevator. The horror stories were all true about the unguided, unlighted, and single cable box that is the transportation down into the mine. Between that and the mine, the whole thing seemed very intimidating!

Despite all the warnings and conversations, despite the careful preparation, the mine surpassed my expectations of flying difficulty. I had built smaller airplanes that could climb like crazy and props that were low in pitch to really aid quick assent. The RPM was unacceptable for a warm, still site, but Slanic is neither of those. Practice day was a nightmare for me. I think everyone who did not regularly fly the mine had the same experience. The model simply would not climb despite any tweaking. And I thought I was prepared! After the 'Hot Lunch', I took the smallest blade area prop and dropped it's pitch even lower. This improved times, but how long can something fly with an RPM of ~68? My best 1/4 motor time for practice day: 6:15.

Round 1 arrived too soon for me, but I tossed one up and managed a 25:20. It dead-sticked from nearly 50 feet. The 1/4 motor tests were only good to roughly trim a flight pattern, as the same setup on 1/4 implied an eighteen minute flight. Round 2 I lengthened a motor and still dead-sticked from fifty feet, but increased to a 27:35. In Round 3 I was unsure as to the trim of the new model- the previous one had shed it's wing and it's long posts. Time was running out and Steve Brown suggested that I consider this a test flight that doubled as an official. Amazingly, it flew a 29:20. Round 4 came along and during the flight I had to steer the model from the evil walls. It was at about 100 feet and with the aid of the spot light I guided it from certain death. Only because of Gary Underwood's great advice and practice at Lakehurst was I able to pull that off. The prop hung up for about three seconds causing the model to nose dive and lose a minute or so in time. Still, it flew 29:32, just this side of thirty. Rounds 5 and 6 were on the final day. Steve had told me that usually there were not any major changes on the last day. I had noted the night before that I had fallen from 2nd to 4th place and was 3 seconds behind 3rd . How hard can it possibly be to make up three little seconds? In Round 5 I used one attempt when the model misbehaved on climb-out, but lost the round when it's wing twisted way out of proportion, earning a total of 19 seconds. I was extremely mad with the

airplane but spent hours fiddling with it on 1/4 motor tests trying to make it at least climb suitably. Unbelievable! It was pulling 29's yesterday, and it was unchanged, but today it refuses to climb. I put in a flight of 21:07. Talk about betrayal!

So, I took 4th place. I vowed that I would never build an unbraced model again. And promised myself to keep the posts below 4 inches. The problem: As torque bends the motor stick, the long wing posts amplified the it, severely warping the wing. This makes a certain limit as to torque not that the motor stick can stand but the wing and it's tremendous drag. Now John Tipper of Great Britain flew a *Stork* and pulled off a 43:11. My hat is off to him, indeed.

Steve Brown very calmly and coolly defended his title as World Champion. He put up two awe inspiring flights of 44 and 45 minutes. What an amazing fellow he is. I sat next to him at 'dinner' several times and was amazed to find that he can indefinitely supply you with cynical but amusing comments about the salt mine, the contest, or the reliability of unbraced F1Ds. He really was very different than what I had seen or guessed.

The next day there was the EuroCup F1D event which the smartest US team members decided to not to attend. The constant 53 degrees and 68% humidity gnaws at you. But some how I managed to take first in the Junior division- mainly because some of the Juniors *were* smart and 700 feet above me. I still ,though, did not reach thirty minutes, but I bettered my times by 11 seconds(wow). Larry Coslick did a tremendous time of 44 minutes, and blew his competition away. The US placed first in team as well- Dad whipped out his two Storks and promptly leapt the thirty minute barrier that I had hit so hard. He placed highly in the rankings and assured a team victory.

The final night, the awards banquet, was a riot, in any way you wish to interpret that. My friends, the Romanian Junior Team who had taken me out on a walk through the town of Slanic, invited me to their table. I was surprised(though I shouldn't have been) that they were all rather 'potted' ,as the English say, and demanded to their team manager that they should have been able to go to the dance hall in town. It was 11 o'clock, and the team manager was no fool. Ha! I exchanged addresses with a number of my competitors- including the long legged Tatianna who took 1st. I hope to correspond with them.

I owe an impossible amount to my Dad. He has supported this entire F1D thing from the start, and has made it possible for me to build and to practice at places like Lakehurst and Johnson City and Moscow. Without him, I wouldn't have probably become interested and then fascinated and then active in indoor models. It has been a special thing that has happened and I am glad I can do something with him that both of us enjoy very much.

I have never actually seen a report on a Slanic World Champs that gives a description of anything but the contest. Most of the competitors stayed at an apartment complex about a mile from the mine. The room that Dad and I shared appeared to be a wedding suite, as it was larger and had more tables than the other rooms. These tables were soon in use- the room became repair central for some of the team. The rooms themselves were fairly rough, but very survivable. We could not drink the water out of the tap, so bottled water was used for every thing. Unfortunately, the only bottled water is a slightly sugary fizzy water which made brushing your teeth miserable. Somehow, Steve Brown found a bottle of still water near the end of our stay and guarded it well,

saying that it was more valuable than gold. The dinner in this apartment complex was always a fixed meal starting at 7:30 and continuing on most of the night. The meals ranged widely from trout to chicken to pork chops. Usually they were served with a type of potato and some soup. It was good to have a hearty meal after a chilly day in the mine. Coca Cola usually was the typical drink. Dinner was followed by a nice desert. The kitchen worked extremely hard for the contestants and even catered to the mine every day. The 'Hot Lunch' was usually a warm pork chop with cheese and potatoes. Dad and I brought some MRE's down but found that they would get too cold to eat.

On the way to and from the airport, we would pass horse drawn carts loaded with hay. You could look out into the fields to see horses and plows harvesting the hay or corn. It was truly amazing to open the room window and look out and see a woman herding cattle to a hilly pasture. The entire place, except the mine, had a charm to it. I went out to look at the town of Slanic whose population is around two thousand. The Romanian Junior Team, whom I was with, were very popular in the town and knew many of the locals though they are from Transylvania. We went to a city park of sorts where they enjoyed 'hanging out'. There are many salt formations coming out of the ground and a pond has formed in the center of a collapsed formation. It is a favorite swimming place of those in the town because of the unusual buoyancy.

This has been an incredible trip. It was my first time out of the country and I received a first class dose of culture shock. The contest was great. The site and the people were great. Ha! For all the Gloom and Doom about Slanic, I wouldn't have missed it for the 'world'.

F1D INDOOR WORLD CHAMPIONSHIP
Slanic-Prahova, Romania, 13 Oct.- 15 Oct. 1998
Page 1

Final Results - JUNIORS

INDIVIDUAL RESULTS FOR ALL COMPETITORS

Pos	#	Name	Cntry	Rnd 1	Rnd 2	Rnd 3	Rnd 4	Rnd 5	Rnd 6	Total
1	14	MOSKALIEVA TATIANA	UKR	16: 7	22:58	31: 3	30:20	35:59	38: 9	74: 8
2	32	FILEK JAKUB	POL	34:35	25:50	34:42	34:36	35:32	9:51	70:14
3	49	ROMONTI CRISTIAN	ROM	16:26	25:42	28: 7	30:48	24: 8	17: 7	58:55
4	12	LEONARD NICK JR.	USA	25:20	27:35	29:20	29:32	0:19	21: 7	58:52
5	46	SOMESAN HORATIU	ROM	25:28	26:45	26:46	20: 4	27:49	29:53	57:42
6	47	VAIDA AURELIAN	ROM	25:48	25:24	29: 2	28: 5	28:19	25: 6	57:21
7	38	VALIKONIS IGNAS	LAT	13:25	12: 1	14:20	18: 0	17:31	20:18	38:18
8	39	MULEVICUS AUDRIUS	LAT	13: 0	12: 7	17: 9	15:13	18:43	18:16	36:59
9	37	TYLA GYTIS	LAT	0:19	12:26	1:35	15:16	14:28	16:39	31:55
DSQ	3	KOLIC IVAN	YUG	19:28	24:10	24: 5	10:20	8:30	29:58	54: 8

AIRLINES and MODEL BOXES BY CEZAR BANKS

I think so much lore. most of it negative and horror filled. has been bandied about in the indoor community on this subject that fact and fiction have gotten blurred. The mere idea of giving over your fragile and personal creations to some cretin (supposedly) who will kick, drop, throw, slam or otherwise abuse your precious box without giving it a second thought is just too much. Are you supposed to fly to a contest three to ten time zones away only to discover when you get there so much damage it literally ruins your chances and makes you ill? All for naught? No wonder many would rather face a root canal without anesthesia than suffer the angst that accompanies shipping your model box in baggage.

BUT HOLD ON A MINUTE! Aren't there any successes out there? Hmm. Well, yes, there are. I know of at least two that go back 15 years (mine) or more (Jim Richmond's). And as Jim and I have discussed; between the two of us, we've probably got more airline/model box experience than anybody. Something to think about. You won't find us among those campaigning for smaller F1D's to "solve the airline shipping problem". The interesting thing is that our boxes are very different. Which is another way of saying, "there's not just one way to do it." I would even go so far as to conjecture that "if we spent as much talent on box design and coping with airline travel as we do with model design, the problem would shrink to near nothing." So, for what it's worth, here is the way I did it. Of itself, it won't guarantee success; nothing does, but I think it will improve your chances. Maybe a lot.

My first experience shipping F1D's aboard airliners was in '78 going from San Diego to St. Louis (in connection with my job) and then by rental car on to the then annual indoor champs at West Baden, Indiana. I had a humungous old suitcase into which I packed two F1Ds, two penny planes and one EZB. I arrived with damage (about eight hours to fix, as I recall) and learned my first lesson. Stuff that looks like suitcases will be handled (make that mis-handled) like suitcases. Out went that approach.

Then I made a box out of two WWII surplus 3/8" plywood foot lockers hinged on the long end to open like alligator jaws. It was strong but gosh awful heavy and too wide to carry easily because your carrying arm went out at a 30 degree angle. Aching fatigue set in quickly. More lessons learned: Make it light. Make one dimension narrow for easy carrying. Jim Richmond feels this is important for another reason; the narrowness inhibits air from swirling internally when the baggage handler swings the box. Anyway, this led to my '79 box (see plan in last INAV) which with minor mods is still what I use today. I added the foam/vinyl "surround box" in '82, and for the last 15 years, I've had no model damage aboard airliners! Have had a few film holes to patch but that's all. I believe the foam/vinyl surround box is a critical addition since it provides considerable shock, vibration, and "ding" protection. I also plastered "FRAGILE- DELICATE INSTRUMENTS" on the outside. Of course this could be a mixed blessing if a baggage handler looks upon it as a challenge. But so far, so good. If asked what kind of instruments these are, tell them they are "used to measure air currents in large buildings." You won't be lying.

Before going to the Romania WCh in '82, Team Manager Bud Romak and I drafted a letter to Air France explaining the whole business and asking for special box loading and unloading. We got it. No damage. We have used that same letter (changing only dates, airline, and flight numbers) for all overseas WCh since: '84-JAL, '86-BA, '92-Lufthansa and '94-Lufthansa. All responded positively and we had no damage with any of them. I think these letters are a must for overseas flights.

For attending domestic trials and contests, I've usually shown up at the check-in counter un-announced with my model box. I then ask for the shift supervisor. When he or she shows up, I show them the box, lift the top flap, let them look through the plexiglass at the contents, and ask them to see that the box is hand carried into the baggage compartment. They lift it, see that it's easily manageable and agree. I've never yet been refused. I suppose there's always that first time so this is a good time to practice your social skills. Don't demand anything. Smile a lot. Tell them you've done this before with their (and other) airline(s). That should clinch it. At my destination, my box has sometimes been put on conveyors. Because of its form factor, it has slipped through swinging doors unscathed.

Now, for the other shoe. After reading the above, you'd think I think air travel with my 36" box is no big deal, right? "Not quite." I still feel some anxiety. If I can get someone to drive my models to a meet, I'll do it. Be dumb not to. BUT DO I THINK THE RISK OF TAKING THE BOX BY AIRLINER IS MANAGEABLE? YES, I DO. However, our 15 year success notwithstanding, do I also hedge my bet some? Sure, why not?. Starting with the '84 champs, I made an extra "insurance box" out of 3/8" foam board to carry the components of two F1D's and which I could hand carry into the cabin with me. Wouldn't you just know, my 36" box has always made it thus far and I've never had to depend on the carry-on box? Not a bad record. Agreed?

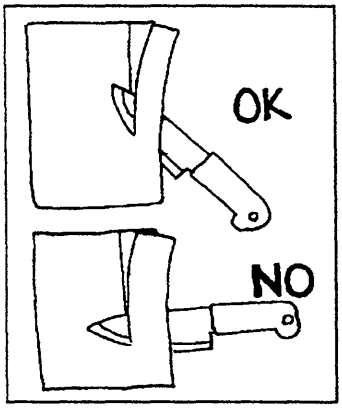
Styrofoam for Indoor Scale Models

Steve Gardner

I hope you all have seen some of the wonderful foam models that have made their way into the various model magazines in the past two years or so. First in England, then all over the place appeared these unusual models. Scale models of subjects that are a bit out of the ordinary, like Lancaster bombers, TU-16 "Bear" bombers, sub-peanut Curtiss seaplane racers, and all sorts of others. They are made from the blue or pink foam that is commonly used for insulating homes. This material is very easy to work with so long as you use very sharp tools. It is extremely inexpensive, a TA-152 fighter with a span of 32 inches cost about a dollar to make. With the proper technique this foam can produce models of exceptional toughness while keeping them reasonably light. There are a large number of subjects that have very complex cross sections that make them difficult to model in stick and tissue. With this new stuff you will be looking for the ones you used to shy away from. You will not need blast tubes and there will be no more trying to match tissue colors to patch things up. Warps are not nearly so likely and are simple to deal with too. The stuff is really nice, but there are some things that are very different about the way you use the foam, so I have gathered together some of the things I have found out while messing around with foam this past year. I hope you find the ideas here helpful.

The foam we are talking about is the stuff called "Styrofoam" by Dupont. It has lots of other names depending on who is selling it. You can most easily find it in the large home improvement stores. The stuff is used to insulate between joists in the vertical walls of houses. We are not talking about the "expanded bead foam" that most people think of when the word "Styrofoam" is mentioned. The foam we are going to use is much finer in texture and also much stronger. It is about 1.5 pounds/ cubic foot, half again heavier than the beaded stuff, but of course much lighter than the finest, hardest to get balsa. I paid $14.00 for a 4'X8'X2" sheet that will make a very large number of models. You can find it in sheets as thin as 1/2" to as thick as 6", with the price going up very fast as the thickness does. Sheets half as thick as the widest fuselage you foresee making are what you want, since we will always be splitting the fuse down the centerline.

I am always asked what I used to cut the foam with. I have yet to need a hot wire setup, although I can see where it would make things simpler. To cut this foam you will need to have very sharp blades. I use a paring knife made by Chicago Cutlery that has a very slight curve to its edge. It is very easy to sharpen using a set of ceramic rods like those you get at good knife stores. When you cut the foam, draw the edge of the knife through the material at an angle, not with the edge at a perpendicular angle to the cut. SEE FIG.1



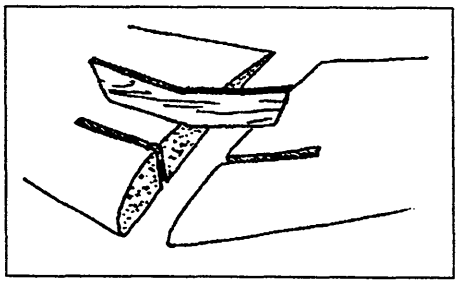
There is a grain to the foam. The foam is less compressible in one direction than the other, so this will determine the orientation of the model parts when they are cut out. Wings especially should be cut out so that the least compressible direction runs span wise. This will allow the wings to be carved and sanded to a very thin, light section without becoming too flimsy. To cut wing and tail blanks out I use a band saw. A peanut might have a wing blank that is around 3/16" thick and this might go all the way up to 1/2" for a 36"

model. I do cut the basic taper into the wing blank thickness, but I always leave plenty of material to cut/sand off.

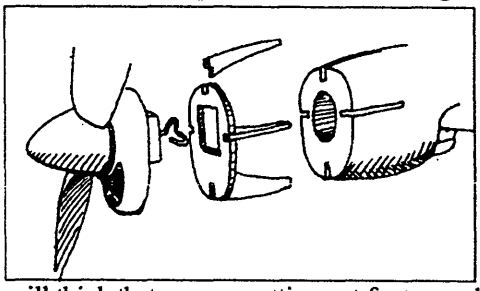
Shaping the foam is very easy with knife or sandpaper. If you have ever built any solid scale models you are going to take to this like a duck to water. Models can be built with this material very quickly. I built a four-gram FW-190 with a nine-inch span with blue foam in a single evening, paint, prop, and all. Once I had this particular model finished I discovered I had left far too much material when I hollowed out the fuse and had left the wings very thick. The model could have easily been a two and a half-gram model and still looked exactly like it does now. Remember, when in doubt, hollow it out. When shaping the model refer to your drawings as often as you need to so that the model comes out with the proper shape and cross section. I use a sharp knife for 90% of the shaping process. This is faster and actually easier than sanding even though the foam sands so very easily. Use a strong side light to make the shape of the piece you are carving stand out. This will make it much easier to see where you need to take material off and where you need to ovoid cutting. If you do happen to cut too deeply into the part you are making, you can simple splice a chunk of foam into the undercut area and reshape it!

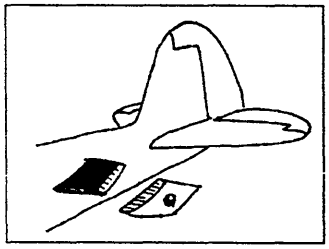
To mark the foam for carving I use a black permanent marker and mark the outline so that when the part is cut out the black outline will remain on the waste material. If you need to mark the foam in an area that will show on the finished model you should use a water based marker. These will tend to bead up on the foam and be a bit harder to see, but will come off of the foam much easier and help prevent you from having to cover black marks with paint.

Once you have the basic shape of the fuse carved out and sanded roughly to shape you can decide how you want to fit the wings. You can cut the wings to fit the fuse sides on the smaller models. This will allow a greater amount of clearance for rubber motors and is plenty strong enough for peanuts and smaller models. For large models you will probably join the wings with a simple joiner as shown in FIG. 2. With the wings



joined you will have to cut and fit the fuse to fit the wing surface. This is done before the fuse is hollowed out so that you will know where the fuse and wing meet and can leave an extra bit of foam around the joint. To hollow the fuse you simply split the fuse down the center where you joined the halves before shaping. I use a motor tool with a very small router bit to cut out foam from the inside of the fuse. I also use a 1/2" dia. sanding drum on a very low speed to cut out the excess foam. Leave most of the foam in the nose area that is not in the rubber motor's way since you will probably need the nose weight anyway. This will also make the front end easier to fasten the front former for the noseplug, see FIG.3. Leaving a very small bit of extra foam around where the rear peg inserts will be is a good idea. See FIG.4. Everywhere else cut lots of

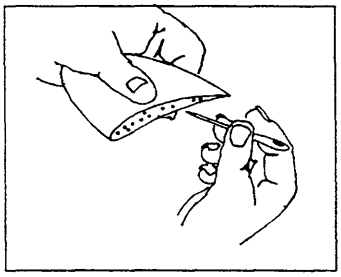




foam out. You will think that you are cutting out far to much material from how flimsy the fuse shell seams to get, but when you join them and fit the wing into the wing opening the fuse will get very stiff and strong. For a peanut the fuselage wall thickness should be about .050" or less. This will result in an

incredibly strong model. Even a 36" model should have a .075" or less average thickness from the middle of the wing on back. The more you take out now, the nicer a finish you can use, and the longer the model will fly. Use a nice strong light to see how thin the foam is getting so you do not cut through anyplace. Also, it is often a very good idea to cut the fin/rudder out as part of the fuse instead of separately. Unless the fin is extra thick it is not hollowed out, but left attached to one side or another during the hollowing step.

Gluing this material is easy. I use the odorless CA for all construction and the Foam Primer Pacer sells for using CA on foam. Epoxy can be used as well, but it is very heavy. White glues will work, but since the glue joints are made of a waterproof material, it may take a very long time for the water to leave the glue and so the glue may stay wet for a very long time. If you use water-based glues by all means apply them very thinly so that they can dry quickly. No matter which glue you decide to use is it best if you poke a pattern of pinholes into the foam where you are gluing so that the glue can get into the foam somewhat. I use a sewing needle, the longer taper to the point allows me to poke deeper and get the best glue joints. See FIG. 5.



The foam is finish sanded with 400 grit wet or dry, being very careful not to allow the corners of the paper to mark the foam. Very thin water based spackling may be used to seal the surface, but this can be extremely heavy if not done carefully and well. If use be sure to sand carefully so as not to cut through the sealer while sanding the very maximum amount off to save weight. I do not use any sealer. I just airbrush the appropriate colors onto the model with artist's acrylics. Go for simple coverage and not a super solid look since this paint is not all that light either. A very solid looking model is the result at any rate, especially if you are very much used to stick and tissue. I hand paint the markings on after the basic colors are dry. This is not at all hard, just give it a try. If a mistake is made you can wipe it right off with water. The foam can be found in pink as well as blue, and of course if you are building a model that will be red in the final form then starting with pink will be a good idea. If you must use blue and want the finished model to be red, first spray the whole model with white, then red as needed. The natural color of the foam is good for the underside of camouflaged fighters and the browns and greens cover it really easily too.

You are really going to like the toughness these foam models have. Bouncing off of walls and bleachers is nothing to worry about with these "Nerf" models. I just love the look on the faces of nearby flyers when I blow a motor inside one of my foam models. BLAM! Everybody cringes! No patching, no repairs, no weight build up, no lube soaking, it is just wonderful! These models are also very warp resistant, and you can cut the scale flight surfaces out to trim the model. Give this stuff a try!

NATIONAL FREE FLIGHT SOCIETY

DEDICATED TO THE INTEREST OF FREE FLIGHT AEROMODELING

October 15, 1998

NFFS 1999 TEN MODELS OF THE YEAR NOMINATIONS

Categories for nomination:

1. Models of the Modern era which exhibit unique design and outstanding performance as proven in competition.
2. Unique gadgets, materials or model components which have contributed to the advancement of free flight.

Nominations for models must include:

1. Brief cover letter from individual nominator or officer of sponsoring club.
2. Separate one-page description of model design and competition record.
3. Separate brief resume of modeler/designer.
4. One-page three-view plan with dimensions.
5. Photograph of modeler with model.

Nominations for gadgets, materials or model component items must include:

1. Brief cover letter from individual nominator or officer of sponsoring club.
2. Separate one-page description of item and contribution to free flight.
3. Brief resume of inventor/originator.
4. Photograph and/or three-view drawing of item.

Deadline for completed nominations:

Postmark February 12, 1999

Send completed nominations to:

Larry Kruse, Chair, NFFS Ten MOY Committee
1204 S Mansfield
Stillwater, OK 74074
USA

Telephone: (405) 372-2538

KIBBIE DOME ANNUAL AUGUST 1-3, 1998

There was a record turnout this year--Andrew had all the details worked out, and everything in place when we arrived. The speakers were again dominating the treasured center area. They are suspended by a great many wires, and were covered with black plastic, with the bottom hanging 80 feet from the floor. Fortunately the speakers can be lowered, and the models can be plucked from the top of the speakers while standing on a ladder. The two curtains seemed to snag more models this year, and the net at the far end of the dome captured some models, which landed behind the net on the cross beams. Beginning at mid morning the jet stream above the curtains and near the ceiling was much in evidence, depositing models either on the curtains, the speakers, or the nets. There was only one model that I know of that went above the ceiling tiles, and was lost. That was Anita Taylors' Mini-stick. Those who had flown at Kibbie before had a tendency to adjust their models to top out below the curtains. There was no drift in those areas, and the flights were usually up and down in the same spot. Those who elected to go all out, and climb to the top of the dome had the problem of contending with the curtains, the speaker wires, or the nets. Tn the morning the air was stable and light, but later seemed to get heavy with an inversion layer keeping models at a lower level. We expected Mini-stick times to be at the 12 or 13 minute mark, but only two even topped eleven minutes. There was an amazing total of sixteen entries in Limited Pennynlane. This is not even close to Johnson City totals, but for Kibbie Dome it was outstanding. However, there were six members of the Dona family that flew in this event, including Jacob, age 8, who put up an excellent time of 12:03 on the very first official flight he ever made. He built his own model, and did a good job of flying. Matt Dona, age 10, also had a good time of 11:45. The winning model was a Thrush, flown by the designer, John Lenderman, to a time of 15:05.5. EZB times were good, considering the conditions, with Bruce Kimball getting his personal best time of 28:25, and getting up to just below curtain height. There were some who did not fly, preferring to walt for the International EZB contest, held separately during the fourth day of flying. A report on that competition will be given by Larry Coslick elsewhere in this issue. Many of the competitors noted the absence of Wally Miller, the originator of the EZB event, and were disappointed that he was not present. Wally was involved in his move from Idaho to California, and promised he would be at the next Kibbie Dome fully prepared. Mini-stick was won by our CD, Andrew, flying his Mini-Quark, with a time of 11:27. Gene Joshu knew what to do with his Intermediate stick--he took it out of the box, wound it, and posted two flights of over 28 minutes and the winning time of 30:25. He said the model behaved perfectly, with no problems. Second place was Chuck Dorsett with a flight of 28:00, using the same model that he flew last year. A new event this year was the international class A-6 models. Fresh from doing well in the International E-mail contest, the flyers from the Willamette Modelers group in Oregon won the top places. What is believed to be the first over 7 minute flight was made by John Lenderman with a time of 7:19.4, flying his original design. It was encouraging to see seven entries in ROG stick, with good times posted. Fred Hollingsworth, from Canada, had some new models, and had a very good time of 13:25, which is a new Canadian record. Fred is an enthusiastic builder and flyer--he flew in a good number of events, and really enjoyed himself. The winner of ROG stick was Larry Coslick, flying his model that recently set a record of over 24 minutes in Category IV and also over 20 minutes in Category III. His model featured a VP prop and retracting landing gear. Larry didn't fly too many events as he was testing 3 new models in preparation for the F1D World Champs in Romania. Larry's time in ROG stick was 19:35, followed by John Lenderman flying a light version of his A-6 with the necessary landing gear, to a time of 17:28.5. Third was CD Andrew with 17:03. Open stick was won by Bob DeShields with a time of 34:16, with his flying buddy, Mike Thompson in second with 29:08. There were six entries in Open Stick. Also with six entries was Standard Cataplut glider. The times keep going up in this event. Mike Thompson had a two flight total of 2:50.4, with Bob DeShields second with 2:49.4. Very close! Ed Berray was third with 2:30.1. It was nice to see the Nick Leonards, SR. and Jr., with their F1D

models, also getting ready for flying in Romania, They had some inovative models, with one featuring a variable diameter prop. Edmund Liem, the Canadian F1D team member was in first place with a good time of 70:28 for two flights. In second place was Mike Thompson, using a VP prop for the first time, with a time of 58:14, Pro 20 had 5 entries, and all flew well. The winner was Andrew Tagliafico, one of the originators of this event, with a time of 25:48, followed closely by Mike Thompson with 24:13. Warren Williams flew a creditable 24:13 for third piace. The regular Pennyplane event drew only four entries. We really missed Jim Clem at this contest as he is always a fierce competitor. Bob DeShields flew his biplane to an excellent time Of 18:16. He builds lovely models, and they all fly well. In second place, flying his Thrush plus 10, was John Lenderman with a time of 16:09. Unlimited catapult glider was dominated by those two competitors, Bob DeShields and Mike Thompson. They really get their models up, and they glide so well. Bobs time was 2:56.9 for his two flight total, and Mike had 2:44.0 These guys come prepared! This is shown by the fact that they also took first and second in hand launched glider, with Bob posting an outstanding time of 226.2 seconds, and Mike at 158.2. Bruce Kimball was third flying a glider with a foam wing covered with fiberglass. In the ornithopter event Warren Williams had a large model that flapped slowly for a good time of 8:40. I understand that Warren has built well over 100 ornithopters. He gives away a good number of those interesting models. Gil Coughlin was second with 5:57. Not far behind was Anita Taylor with 5:53.. Anita is a joy to be around, because she is always smiling and cheerful. P-24 had only 3 competitors, but all flew vary well. John Lenderman won with a time of 7:50, and Ed Berray was second with 6:33. Al Lies was third with 6:26, but had some bad luck. His model got stuck in some beams, and would have done real well if the model had made it clear to the floor. Incredibly he was using a motor of .090 at 50 inches long! Watch our for Al next year. Bostonian had only 3 entries. John Lenderman topped Jerry Powell by only 10 seconds. Their times were 3:30 and 3:20. Warren Williams flew his helicopter to a time of 5:45, and Nick Leonard Jr. ended up with 5:09. An event that should be more popular is the 35cm event. Warren Williams had a time of 12:56, showing his versatility.
We again noticed at this years events, a good spirit of fellowship and willingness to help each other. It's just so nice to be among people who are not only competitors, but friends. Our hat is off to Andrew Tagliafico for planning and organizing this fun time together.

Reported by John Lenderman

Big Indoor Contest

St. Petersburg, Florida, January 30 & 31th

January 30, 6:00 am to 12:00 pm

January 31st, 8:00 am to 5:00 pm

230' Ceiling, AMA Record Trials

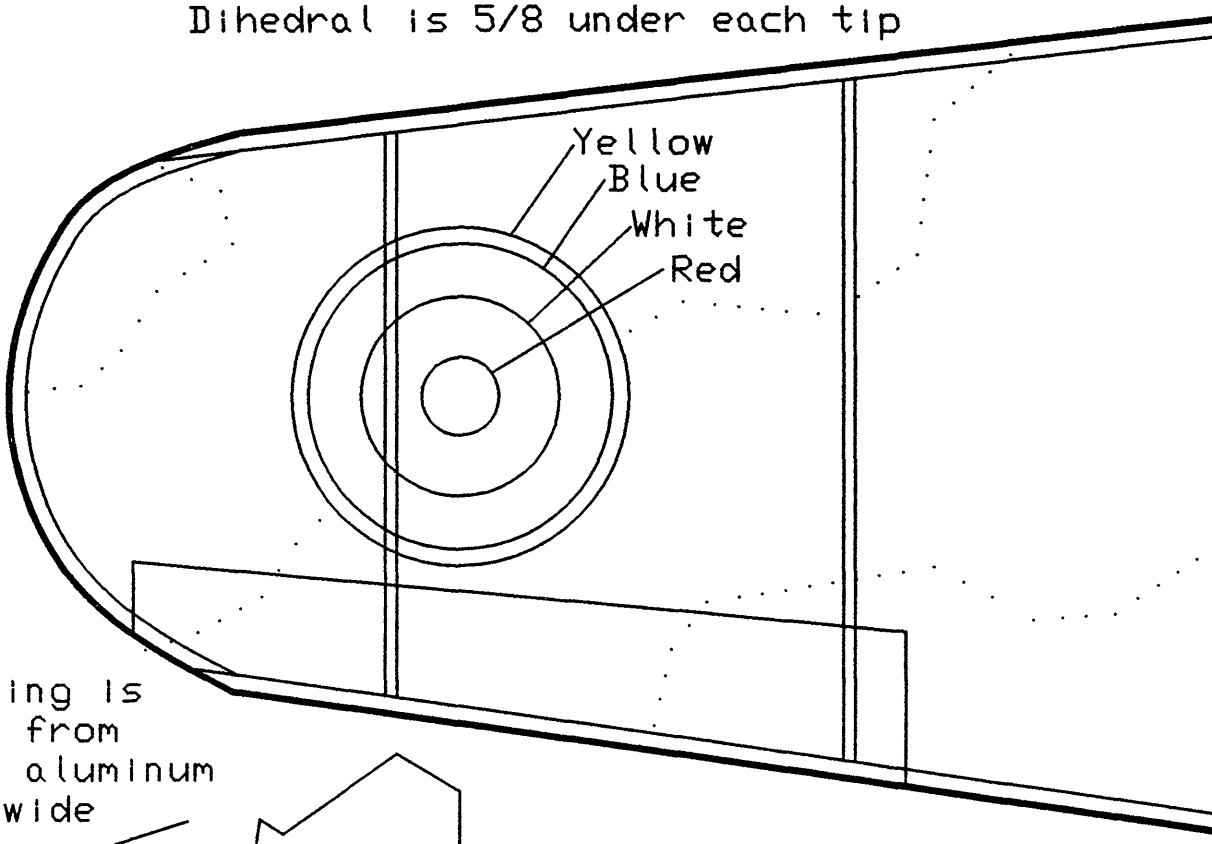
For details contact Dr. John Martin Jr.

2180 Tiger Tail Ave.

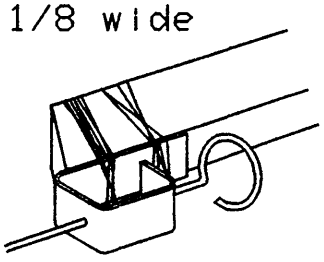
Miami, Fl. 33133

phone # 305-856-1421

Dihedral is 5/8 under each tip



Bearing is bent from 1/32 aluminum 1/8 wide



Bearing Detail

Motor Stick is 1/4 x 1/8 firm balsa

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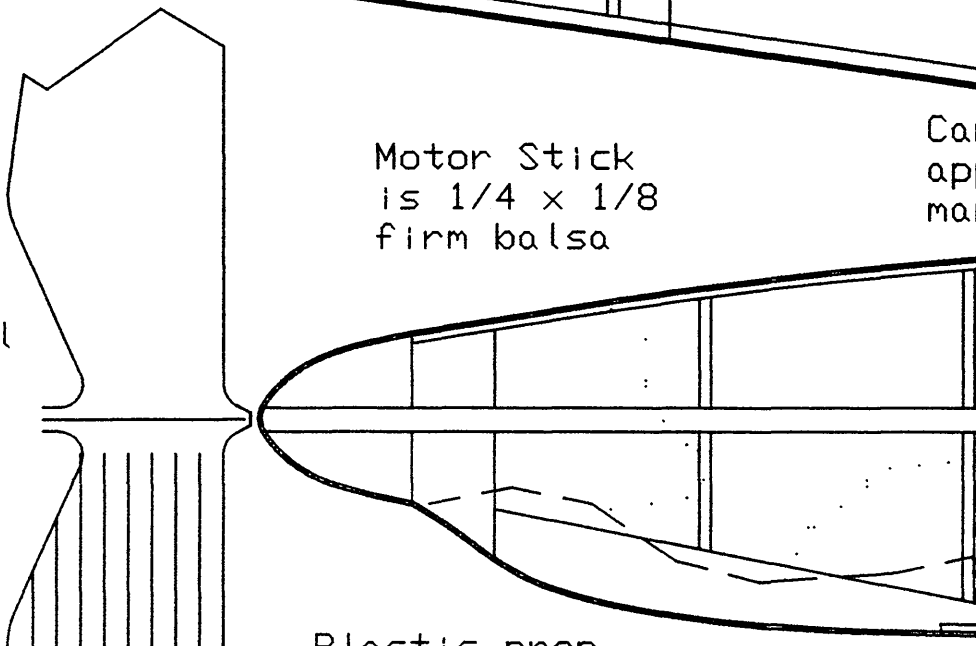
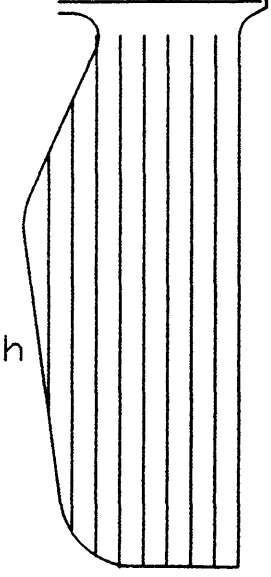


Prop is made from 1/8 balsa laminations fanned into helical pitch

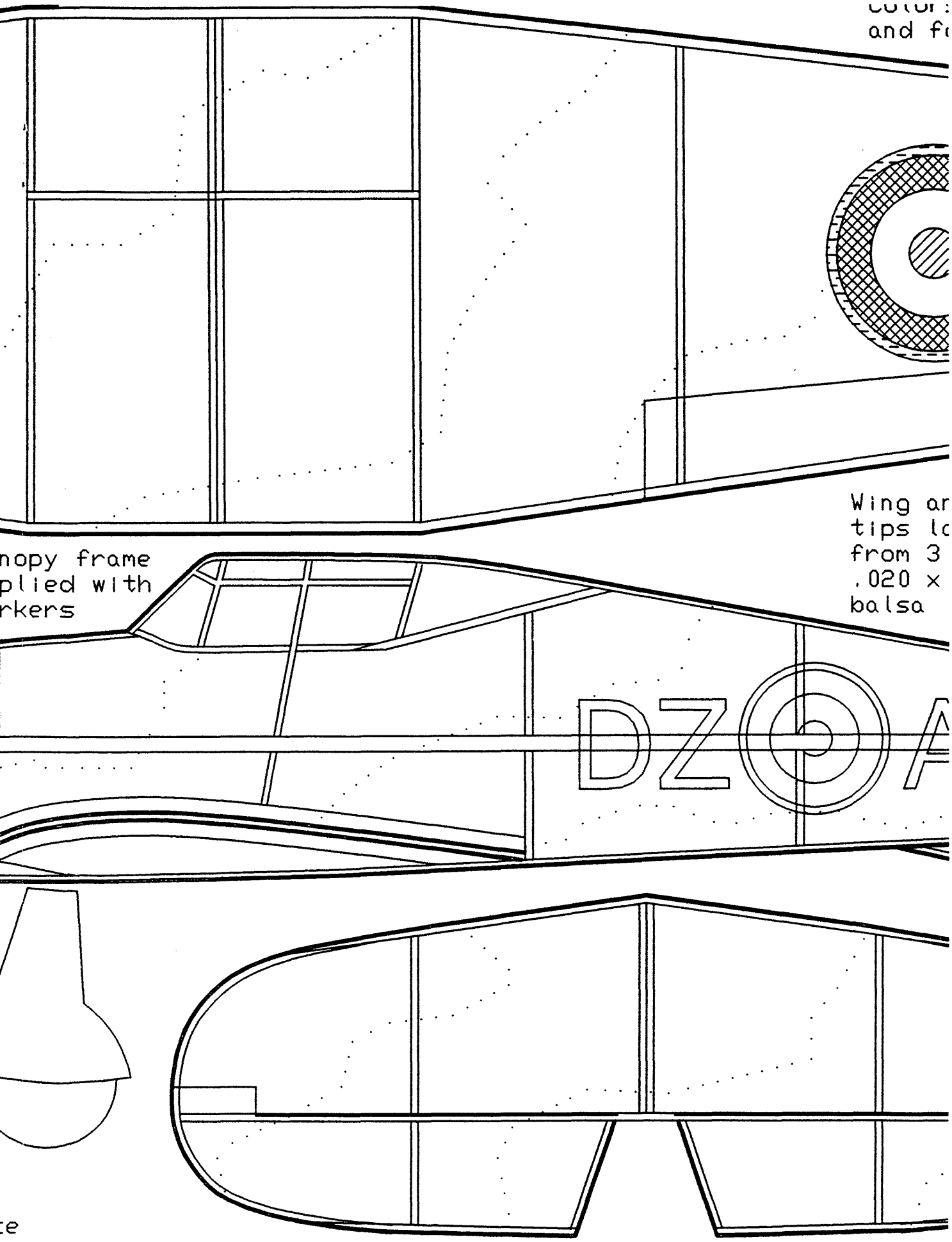


Plastic prop may be used if scraped thinner to lighten 7″ trimmed to 6″ best

Wheels are made from foam turned on Dremel tool

Camoflage tissue made by airbrushing loose tissue with artists acrylic, then ironing tissue flat

Landing gear may be omitted for improved flight performanc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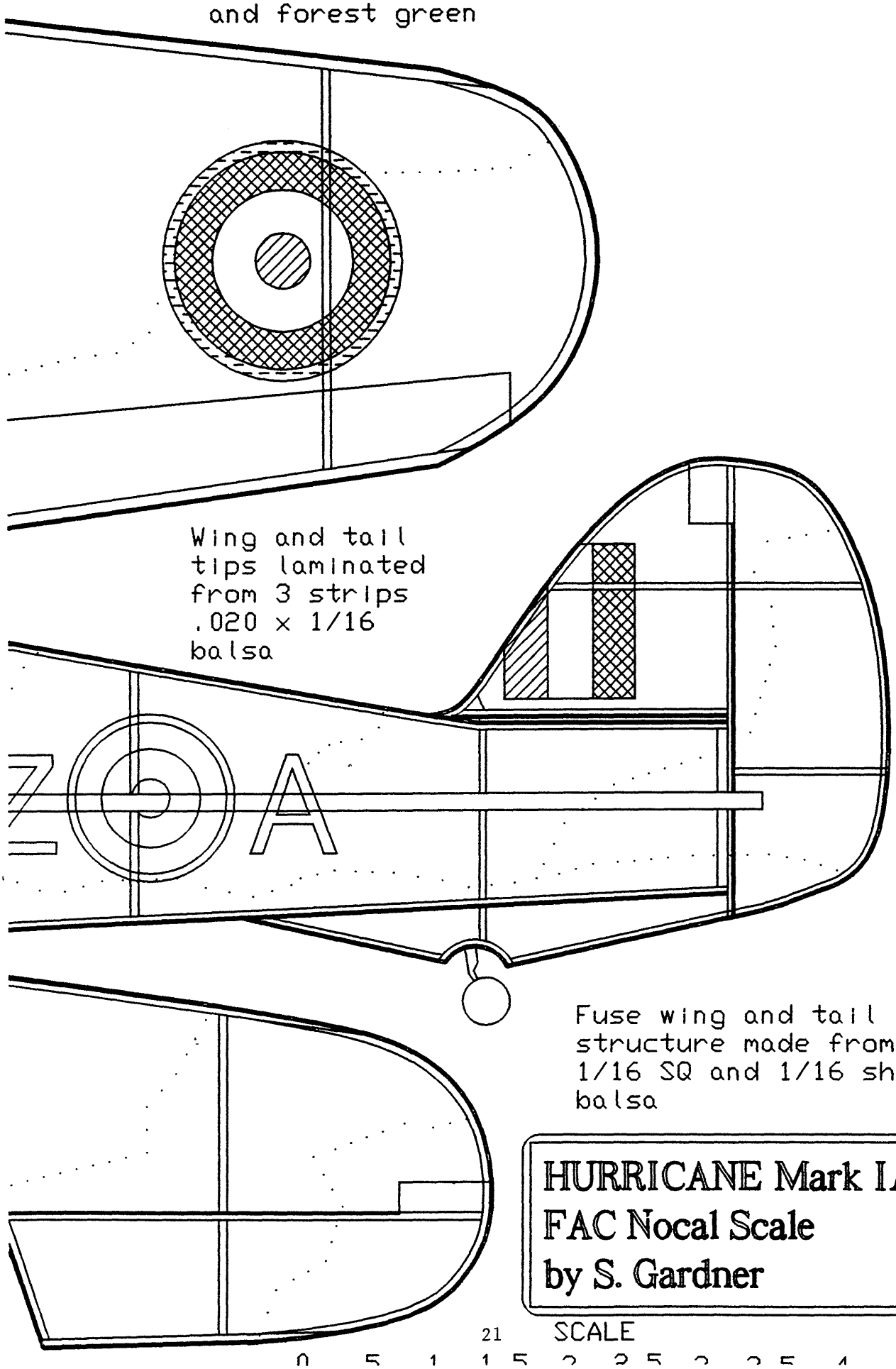
1998 Kibbie Dome Annual Moscow Idaho

Place	Contestant	Time
EZB	(Best 1 of 5)	
1st	Bruce Kimball	28:25
2nd	Darryl Steven	27:20
3rd	Lew Gitlow	24:37
Intermediate Stick		
1st	Gene Joshu	30:25
2nd	Charles Dorsett	28:00
3rd	Bruce Kimball	26:51
F.I.D.		
1st	Ed Liem	70:28
2nd	Micheal Thompson	58:14
3rd	Bob DeShieds	31:37
Limited Penny Plane (Best 1 of 5)		
1st	John Lenderman	15:01.5
2nd	Darryl Stevens	13:46
3rd	Bruce Kimball	13:39
Penny Plane		
1st	Bob DeShields	18:16
2nd	John Lenderman	16:09
3rd	Bruce Kimball	13:43
Mini – Stick (Best 1 of 5)		
1st	Andrew Tagliafico	11:27
2nd	John Lenderman	11:15.5
3rd	Charles Dorsett	10:52
Bostonian (Best 2 of 5)		
1st	John Lenderman	3:30
2nd	Jerry Powell	3:30
3rd	Dave Haught	1:52
Ornithopter		
1st	Warren Williams	8:40
2nd	Gil Coughlin	5:57
3rd	Anita Taylor	5:53
Hand Launched Glider		
1st	Bob DeShields	226.2
2nd	Mike Thompson	158.2
3rd	Bruce Kimball	103.5

Place	Contestant	Time
Hand Launched Stick		
1st	Bob DeShields	34:16
2nd	Micheal Thompson	29:08
3rd	Bruce Kimball	25:17
Standard Catlapult Glider (Best 2 of 9)		
1st	Mike Thompson	2:50.4
2nd	Bob DeShields	2:49.4
3rd	Ed Berray	2:30.1
Pro - 20		
1st	Andrew Tagliafico	25:48
2nd	Micheal Thompson	25:43
3rd	Warren Williams	24:13
P - 24		
1st	John Lenderman	7:50
2nd	Ed Berray	6:33
3rd	Al Lies	6:26
A - G		
1st	John Lenderman	7:19.4
2nd	Lew Gitlow	6:54
3rd	Ken Hark	6:49
R.O. G. Stick		
1st	Larry Coslick	19:35
2nd	John Lenderman	17:28.5
3rd	Andrew Tagliafico	17:03
Helicopter		
1st	Warren Williams	5:45
2nd	Nick Leonard Jr.	5:09
35 CM		
1st	Warren Williams	12:56
Federation R.O.G.		
1st	Gil Coughlin	6:48
Unlimited Catapult Glider		
1st	Bob DeShield	2:56.4
2nd	Mike Thompson	2:44
3rd	Bruce Kimball	2:25.3

Colors are earth brown
and forest green



HURRICANE Mark IA
FAC Nocal Scale
by S. Gardner

SCALE

0 .5 1 1.5 2 2.5 3 3.5 4

1998 International EZB Contest
by Larry Coslick

Wally Miller, a co-sponsor of this event and the founder of the EZB, was not able to attend this year's contest. He and his wife Mona were in the process of moving from Idaho to southern California. Wally and I have been talking about having the International at Johnson City in 1999. I have submitted a scheduling change to the AMA and the NFFS which would open up a time slot for this event. If this happens we will again have the Novice event. Anyone can enter the Novice event, provided they haven't flown an EZB in competition for over 18 minutes.

I want to thank Anita Taylor for the great job she did in running the contest and her husband Tim for designing a beautiful decal for our model box.

As usual the International follows the Annual, but what a difference a day makes. From the start of round one the strong outside winds had a negative effect on any flight above the curtains which are at 135 feet. There was a length wise drift and it stayed that way all day. Below the curtains the air was very stable. I'll give an account of how my day went, or maybe I should say, didn't go.

Round 1. I used the same prop and model combination that I used at Johnson City with a loop of 8/93 .036"X12.5". During practice the day before, the model climbed to within 25 feet of the curtain and did 28 minutes. In round one, I launched with a torque of .12 in. oz., and the model climbed quickly at first but really slowed down at the 70 foot level. I climbed to the top of the bleachers which are about 75 feet above the floor to time the models climb, and get a more accurate idea of its height. It struggled to reach 110 feet, made one circle and started down. What surprised me the most was that the model had no cruise. It will normally cruise for three or four minutes. It landed at 26:52 with over a row of knots left.

Round 2. I had to get more altitude, so the loop of rubber was shortened ¾ inch and the model was launched at .13 in, oz. It didn't respond to the change, although it did climb slightly higher. This time it landed at 25:54.

Round 3. Somehow the model had to get more altitude and have some sort of a cruse. I put on a new motor, .039"X12" and launched at .13. This time it really liked the change, but I didn't. It was climbing too fast. I grabbed

the balloon because it would surely get into the drift if it got above the curtain. It leveled off just above the curtain but started to drift toward the center of the building and the speaker cables. The cables support a large black speaker enclosure which we nick-named the Borg, because it looks like the alien killer space ship for the Star Trek series. My steering was off and I hooked the stab, causing the nose too drop and the prop caught under the wing. End of round 3.

Round 4. The prop was slightly damaged, and instead of repairing it I switched to the prop that I use at Akron Ohio. This prop has a higher RPM, but uses a thinner loop of rubber. After several ¼ motor flights, the model looked as though it was dialed in. Wrong again. I knew the model was in trouble when it reached the curtain at 11 minutes and was still climbing with only 12 feet to the ceiling tiles. At 13 minutes it touched for the first time and was racing for the end of the building and toward a high curtain supported by cables. With the model touching the tiles and the drift, I was not able to get the balloon on it and the model hit one of the cables and slid down behind the curtain. Gene Joshu finally spotted the model on a support beam and we were able to retrieve it with only minor damage. Round 5 & 6. Not worth telling about.

It was a great contest, but a difficult day for me in selecting the right prop and rubber. Days like this are important, because there is the experience to draw on at future contests. If it's too easy, it wouldn't be a challenge.

There were lots of personal high times in EZB during the annual. Bruce Kimball did over 28 minutes with the Hobby shopper. The plans along with building instructions are still available from INAV. Ask for issue #90 U.S. $3.25 per issue (including postage). Overseas $5.50 per issue (including postage) Darryl Stevens did over 27 minutes with a great flying model.

The Novice event was a great addition to this contest. Jerry Powell won the event with a two flight total of 43:39 and Kurt Schuler was second with 38:21.

Wally Miller International EZB Competition

Name	Best	2nd Best	Total	Standing
Larry Coslick	26:52	25:54	52:46	1
Bruce Kimball	26:02	25:35	51:37	2
Darryl Stevens	24:54	24:51	49:45	3
Tim Taylor	24:38	24:06	48:44	4
John Lenderman	24:18	23:49	48:07	5
Bob Deshields	24:16	22:51	47:07	6
Lew Gitlow	23:44	22:08	45:52	7
Mike Thompson	23:39	21:47	45:26	8
Andrew Tagliafico	23:33	20:11	43:44	9
Ed Berray	21:44	21:03	42:47	10
Ken Hark	19:38	19:30	39:08	11
Charles Dorsett	19:43	18:10	37:53	12
Eugene Joshu	8:19		8:19	13

Wally Miller International EZB Competition
Novice

Name	Best	2nd Best	Total	Standing
Jerry Powell	22:17	21:22	43:39	1
Kurt Schuler	19:41	18:40	38:21	2
Jonathan Savre	15:26	14:55	30:21	3
Bob Rovick	15:56	13:59	29:55	4
Chris Borland	12:34	12:23	24:57	5
Charles Higgins	4:00	3:58	7:58	6

THE STORK EXPERIMENT - by B J Hunt

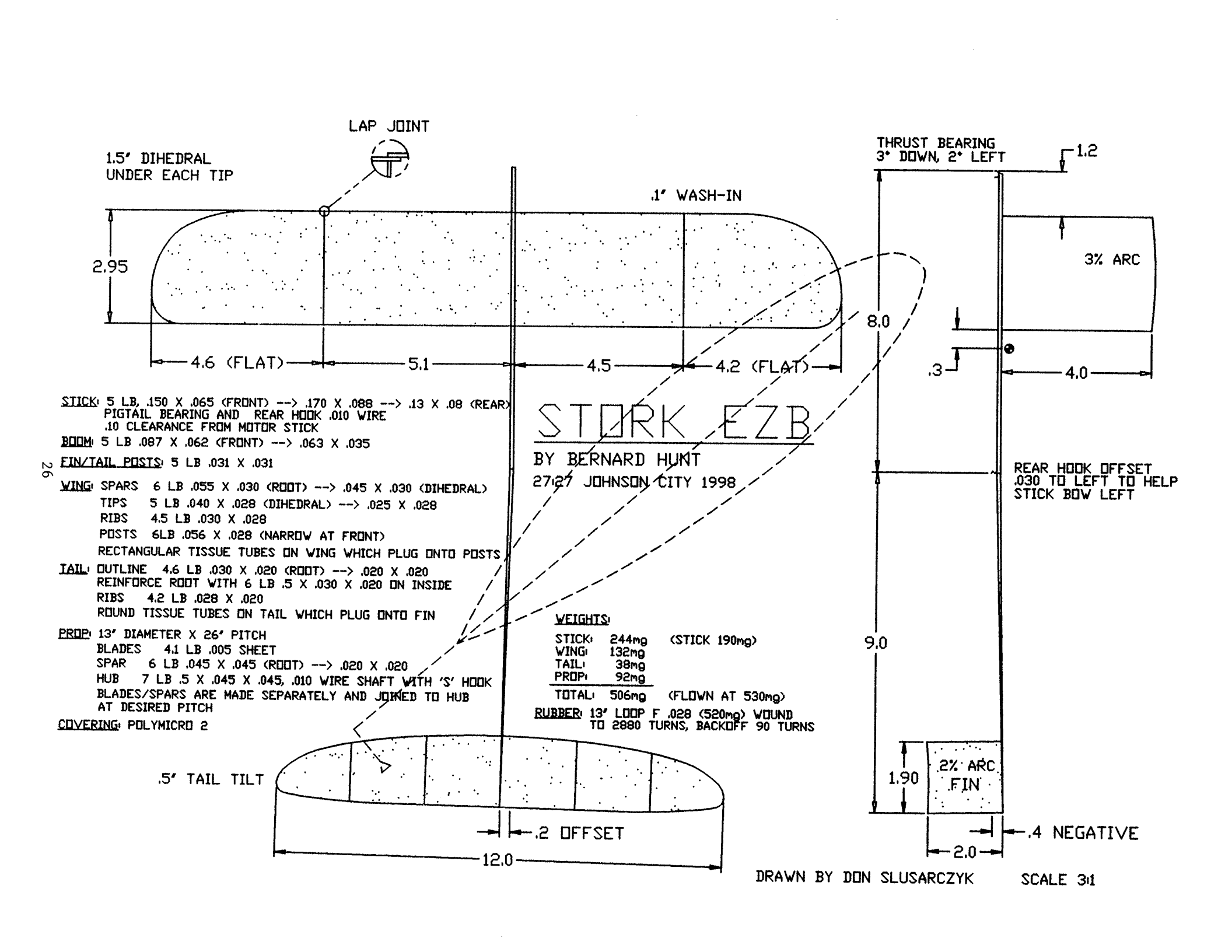
This season I have been experimenting with long wing posts on all my models to see if this gives better times. The aerodynamic idea is that a big vertical distance between the wing and tail reduces the angle of the wing downwash at the tail, which in turn increases the stability of the model and reduces the drag of the tail. The key question is whether the benefits are enough to offset the extra weight and drag of the long wing posts. The following table shows the sizes of posts I have used (all dimensions in inches).

	wing height	tail height	difference	post size (front x side)
US EZB	4	-2	6	0.028 x 0.056
LPP	8	0	8	0.045 x 0.125
OPP	8 (top wing)	-3	11	0.045 x 0.125
Mini Stik	3	-1	5	0.028 x 0.12
F1D	5	-2	7	0.028 x 0.046 + 4 boron
(Int Stik	2	0	2	0.047 x 0.047 = my normal)

When fully trimmed out, all the models flew a beautiful pattern, particularly on the climb, so it does seem that long posts are a good thing for stability. There is a noticeable nose up pitch at launch which needs downthrust and /or stick bow to control. I cannot say for certain that the layout gives better times for all classes, but the Stork versions of my LPP, OPP and Mini Stick are definitely better than my previous efforts. F1D and EZB need more flying experience to decide.

The EZB plan shown is a pretty close copy of Larry Coslick's design in both component sizes and weights. To fit the Stork concept, the nose and tail boom are a little shorter and, of course, it has tall wing posts and an underslung higher aspect ratio tail. I chose to use a non flaring prop, which was a mistake for Johnson City, as the model rocketed up to the roof but it should work better in high sites.

The model was surprisingly easy to trim. As usual for EZBs, it needed the wing warps and the thrust line set by trial and error depending on the stiffness of the stick. My stick was very stiff so I needed lots of down and left thrust and very little washin on the right wing tip. I also sanded the bottom of the stick near the nose as well to get more bow at launch. The wing posts are critical components so use really stiff wood - if in doubt increase the front-to-back size to 0.063" and use 7-8lb density (my pair of 4" posts weighed 25mg). The unusual tail-on-the-fin gave no problems and saved a bit of drag and weight - it looks nice in the air too.


LAP JOINT
1.5° DIHEDRAL
UNDER EACH TIP
.1° WASH-IN
2.95
4.6 (FLAT)
5.1
4.5
4.2 (FLAT)
THRUST BEARING
3° DOWN, 2° LEFT
1.2
3% ARC
8.0
.3
4.0
STORK EZB
BY BERNARD HUNT
27127 JOHNSON CITY 1998
REAR HOOK OFFSET
.030 TO LEFT TO HELP
STICK BOW LEFT
STICK: 5 LB, .150 X .065 (FRONT) --> .170 X .088 --> .13 X .08 (REAR)
PIGTAIL BEARING AND REAR HOOK .010 WIRE
.10 CLEARANCE FROM MOTOR STICK
BOOM: 5 LB .087 X .062 (FRONT) --> .063 X .035
FIN/TAIL POSTS: 5 LB .031 X .031
WING: SPARS 6 LB .055 X .030 (ROOT) --> .045 X .030 (DIHEDRAL)
TIPS 5 LB .040 X .028 (DIHEDRAL) --> .025 X .028
RIBS 4.5 LB .030 X .028
POSTS 6LB .056 X .028 (NARROW AT FRONT)
RECTANGULAR TISSUE TUBES ON WING WHICH PLUG ONTO POSTS
TAIL: OUTLINE 4.6 LB .030 X .020 (ROOT) --> .020 X .020
REINFORCE ROOT WITH 6 LB .5 X .030 X .020 ON INSIDE
RIBS 4.2 LB .028 X .020
ROUND TISSUE TUBES ON TAIL WHICH PLUG ONTO FIN
PROP: 13° DIAMETER X 26° PITCH
BLADES 4.1 LB .005 SHEET
SPAR 6 LB .045 X .045 (ROOT) --> .020 X .020
HUB 7 LB .5 X .045 X .045, .010 WIRE SHAFT WITH 'S' HOOK
BLADES/SPARS ARE MADE SEPARATELY AND JOINED TO HUB
AT DESIRED PITCH
COVERING: POLYMICRO 2
WEIGHTS:
STICK: 244mg (STICK 190mg)
WING: 132mg
TAIL: 38mg
PROP: 92mg
TOTAL: 506mg (FLOWN AT 530mg)
RUBBER: 13° LOOP F .028 (520mg) WOUND
TO 2880 TURNS, BACKOFF 90 TURNS
.5° TAIL TILT
.2 OFFSET
12.0
9.0
1.90
.2% ARC
FIN
.4 NEGATIVE
2.0
DRAWN BY DON SLUSARCZYK
SCALE 3:1

The "Cobra" - Why? and How

Because of the tremendous torque problems I have with mini-sticks, I was looking for some design change that might help the problem. I knew that FF Power models also have that problem, so I got out the 1992 NFFS Book on Power Models, by Keith K. Hoover and studied the very high thrust line designs. I could not quite work out a usable configuration for a mini-stick when I remembered a layout in the 1941 book Model Airplane Design and Theory of Flight, by Charles Hampson Grant, in which he said if you put the thrust line above the Center of Gravity it would solve the problem I had been having. Below is a sketch from Charlie's book that shows this force diagram. It does not completely solve the launch torque problem, but does allow you to launch with considerably more torque. In cruise, the model assumes a beautiful "on the step" attitude. Last but not least, when the model is descending you can tell it is your airplane because of its characteristic "banana" shape!

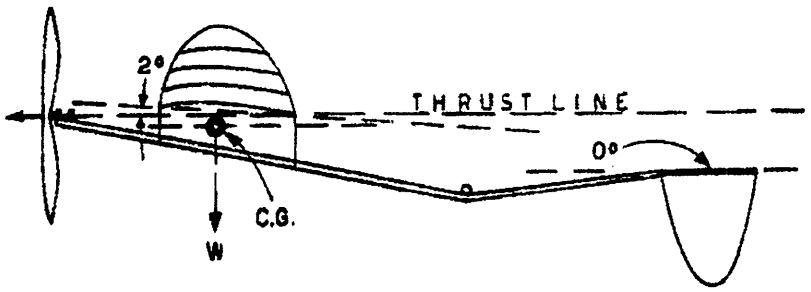
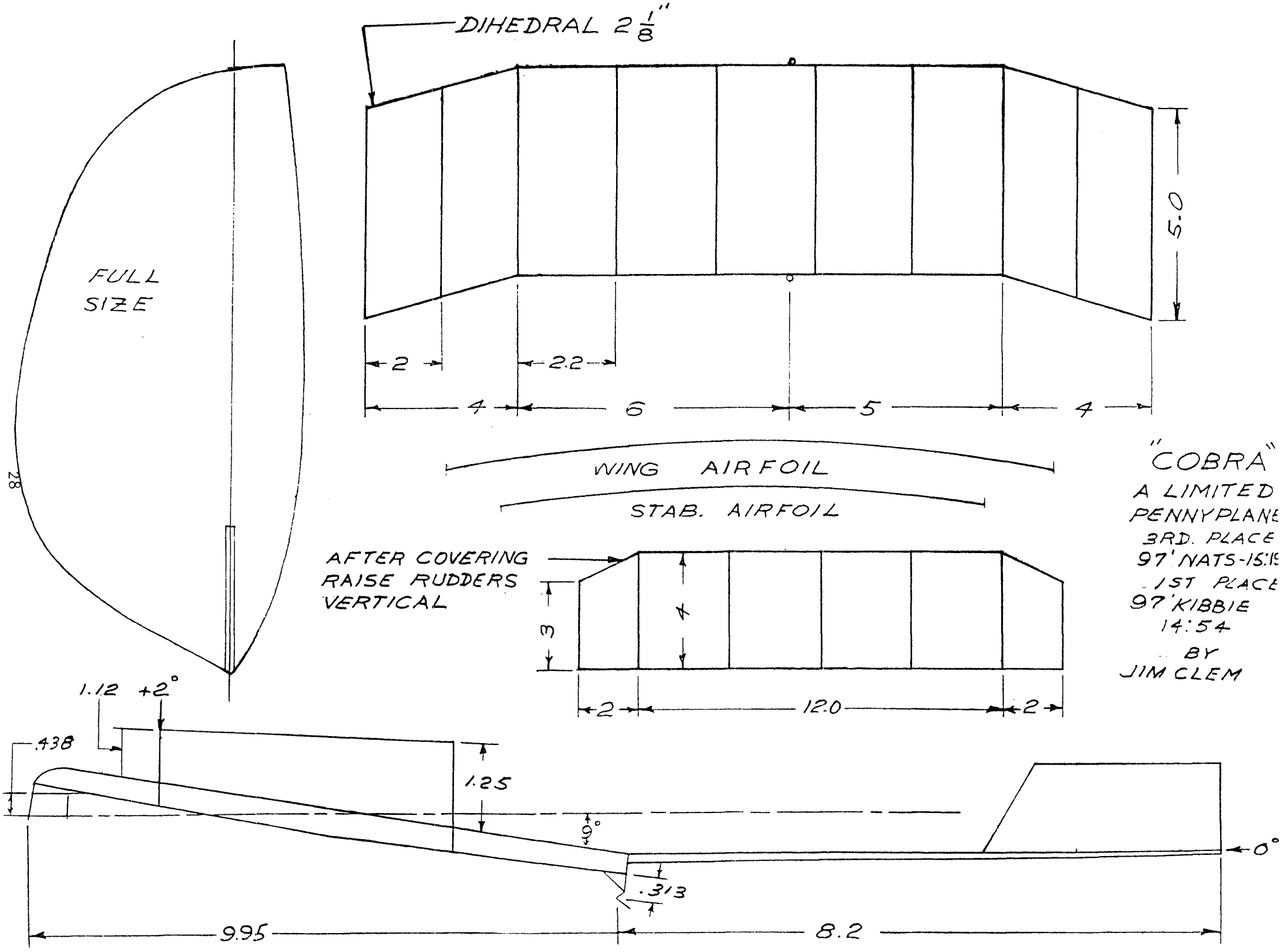


FIG. 66

ABOVE SKETCH FROM - "MODEL AIRPLANE DESIGN + THEORY OF FLIGHT" - P. 85 BY CHARLES HAMPSON GRANT - 1941



"COBRA"
A LIMITED
PENNYPLANE
3RD. PLACE
97' NATS-15:1
1ST PLACE
97' KIBBIE
14:54
BY
JIM CLEM

MODEL NAME "COBRA" - L.P.P. BUILDER JIM CLEM

MOTOR STICK SOLID

Density # 4.8LB. Grain A Length 10" Front, Width .120

Height .200 Center, W. .220 H. .335 Rear, W. .120 H. .200

Cut Weight _____ Finished Weight 1.15 GM. Special Instructions _____

Thrust Bearing, Wire size _____ Other HARLAN BEAR. Web. Density 7#

Thickness .093 **Rear Hook** .020 Web. Density .032

Thickness _____ **Paper Tubes.** Material Used JAP TISSUE

Adhesive Used AMBROID 50/50 Special Instructions 6 DROPS TO F/OZ.

WING

Leading Edge Spar. Density 7# Grain A Length 19" Width .062

Height .062 Weight _____ **Trailing Edge Spar.** Density 7# Grain A

L. 19" H. .062 W. .062 Weight _____ **Tips.** Density 7#

Grain A Tip at L/E. Width .062 Height .062 Tip at T/E. Width .062

Height .062 Weight for 2 Tips. _____ **Ribs Standard.** Density 5#

Grain A W. .032 H. .062 Weight Ea. _____

Wing Posts Density 7# Grain A L. _____ W. .062 H. .062

Wing Covered. _____ Wing Weight Complete. .81 GM. Special Instructions

STAB

Outline. Density 6.4# Grain A Leading Edge Center, W. .045

H. .062 Tip. W. .045 H. .062 Trailing Edge Center, W. .045

H. .062 Ribs. Density 5.5# Grain C W. .032 H. .050

FIN - FORMED BY TURNING TIPS ↑ 90°

Fin, Not Floating. Density _____ Grain _____ W. _____

H. _____ Weight Dry _____ Weight Covered _____

MODEL NAME "COBRA-L.P.P. BUILDER JIM CLEM

Prop Spar. Density 12-14LB. Grain A Spar Length 4.5"

Dimensions at prop shaft, W. .062 H. .062 Dimensions at Tip.

W. .062 H. .062 Spar Weight. _____ Prop Shaft

Wire Size. .018

Prop, Wood Blades

Blades. Density 4.5LB. Grain A Blades Area. Ea. 9.375 SQ. IN.

Blade Thickness .025 Weight for 2 Blades _____

Give prop pitch at 45 degrees and one inch from tip. Pitch at 45 degree 20.4" Pitch 1 inch

From tip. 20.4". If V / P, Low pitch _____ High pitch _____

If V / D, Diameter when extended _____ Diameter when folded _____

Speical Instructions on prop construction MAKE 4.5" PROP SPAR ROUND AND INSET 1.25" INTO EACH BLADE. PROP. WT=.75GM

RUBBER

Loop Length 19½ Width .075 Rubber Vintage, Month and Year 8/93. Weight of Loop. .078 OZ. 2.21 GM. Turns 2762

Back off Turns. _____ Launch Torque in inch ounces. -6 Turns Left 330

Do you use O rings. Yes. YES No. _____

TRIM

Wash In, Wing Left panel .093 Wash Out Left panel. 0

Wash Out, Right panel 0 Wash In, Right panel 0

Wash In Stab, Yes _____ No NO How Much _____

Down Thrust. NO Left Thrust. 4° Special trim instructions.

RANDOM NOTES ON HAND LAUNCHED GLIDERS

Do not use a large stab or rudder. If the model is too stable, it will not make the transition quickly and without altitude loss. In handlaunch, the transition is everything. If the stab is too large, it will tend to let the plane fly even though it is really badly out of longitudinal (fore and aft) trim. You will wonder why adjusting the stab does not bring better flights, when the glider is basically out of balance. Too large a stab will keep the HLG from any snap recovery and the plane will fly through at the top of the launch. If too small, the stab will sink out at gliding speeds because some weight is carried by it. The stab should be tapered from the center outwards to approximately 1/32" at the tips. The stab leading edge may be relatively blunt. You do not want a stab that overlifts. Some people prefer a wing airfoil with a thin section and a high point 40% back from the leading edge. This type of section has less drag than a thicker wing section, but will result in a faster glide and less stability. A thicker section with a high point 25% to 30% from the leading edge may have slightly more drag, but also a better glide and will be more stable, especially in windy weather.

In general, the rudder is too effective at high speeds, and not effective enough at low speeds. The solution is to use stab tilt for the glide turn, keeping just enough rudder for a transition.

Offset the centerline of the wing 116" to the left of the centerline of the fuselage (SWEEPETTE).

Cut out the fuselage slightly over-size to allow for stress relief in the tailboom area, then sand it down to the final shape.

Arrange the wing so that the heavier panel is on the inside of the glide turn. Put built-in washin in the tip of the inside panel. The washin does two things; it makes the panel stall first, dropping the model into the core of the thermal; and it keeps the plane from spiralling too tightly once it is in the thermal.

Resist the urge to make round edges on the fuselage! Rounding saves very little weight but seriously diminishes strength.

Before the last coat of dope on the stab and fin, apply a strip of lightweight Japanese tissue to the rear half of both sides of the fin. Also, apply a 3/4-inch wide strip of tissue to the rear of the stab; top only on the left, and bottom only on the right. Apply the tissue with thinner. These tissued surfaces will be much easier to adjust later for flying trim.

Use white glue for attaching the stab so that it may be easily removed for adjustments.

John Oldenkamp, on his ZWEIBOX, tapers the 1/4" balsa fuselage on the right side only to approximately 3/32" X 1/8" at the extreme aft section. This taper, plus the airfoiled fin (flat on the left side), gives an automatic left turn. John glues the fin onto the side of the fuselage instead of on top.

Bias-cut the finger rest from 1/4" X1" trailing edge stock. The grain ends up in the proper direction and will take very little work to finish.

The POLLY uses built-in rudder offset, 1/8" over 14.5" or 0.5-degrees. The POLLY does not use stab tilt. POLLY does not fly 0-0, but uses some incidence in the stab as a margin of safety of an off-launch. The BLACKJACK design by Larry Sargent also mentions incidence as one of the best kept secrets in HLG flying;it helps in the rollout and helps to avoid the straight up/straight down flight patterns. Use 1/32" to 1/50" of incidence at the wing leading edge.

Tom Peadon (U.S.KID) recommends that the stab be 1/2" below the level of the wing. He can't give a good aerodynamic reason, but it has been proven over and over when he didn't adhere to it.
Kit Bays uses a semi-symmetrical airfoil on heavier, windy weather HLGs. This type does not glide very well in still air, but it gives penetration and stability in the wind.
Control glide turn with the stab tilt.
Control climb pattern with rudder.
The four basic adjustments for HLG: A rearward center of gravity and zero decalage (no incidence in wing or stab) gives a loop free launch. Slight left rudder provides launch turn. Stab tilt for left glide turn. Washin in left wingtip prevents spiral dives.
When a handlaunch goes straight where you point it, and then fails to make a transition, it is only a tweak of up elevator away from perfection.
If the plane turns too tightly in the glide stick some clay on the right wing tip and check the alignment of the rudder.
If the model tends to climb in a wide, flat circle, you can probably counteract this by warping the trailing edge of the stab down, warping a slight part of left rudder, and throwing with more of an overhead motion.
Basic safe trim: Left glide turn in stab tilt, wash-in of the left main wing panel, slight left rudder. May also skew the wing, right wingtip forward, to help the left-turning transition. Similarly, offsetting the wing (about .06") to the left helps save tip weight and bending. Bend wash-in into the left wing progressively from none at the wing root to about 1/16" to 3/32" at the polyhedral break (none in the tip). Bend in equal amounts of "up" on both sides of the stab until the glider has a slightly stalling glide. Put in enough stab tilt to give a hint of left turn when hand gliding. Properly trimmed, the glider will do a 220-degree to 270-degree climbing turn, and then drift gently into a left glide turn. Having the model pointing downwind after the transition will help keep the glider from stalling as its airspeed decreases. You may notice that planes that transition facing the wind tend to stall and lose altitude, especially if it is windy. Having a downwind transition will also allow you to wait longer before throwing into a thermal.
Symptom: instead of spiraling around in a smooth climb, the HLG just slow rolls in a more or less straight line. Problem: the glider is shy on "up". Cure: add more up in the stab (leave center of gravity as on plans). This will make it climb more quickly and roll more quickly. Take out stalling in the glide with stab tilt. An incorrect launch does not usually cause this problem.
Symptom: the model spirals around only about 90-degrees; then the wings level and the model noses up into a stall. Problem: the model was either thrown with too much bank or has too much "top" rudder. Cure: take out left rudder and/or add more wash-in to the wing. Bank the model less or launch more skyward. Sometimes more "up" may be needed. The glide circle may be readjusted with stab tilt if necessary.
Symptom: the model patterns very tightly or loops. Problem: the model has too much "up", or was thrown with too little bank or too much skyward. Cure: take out some up. Open the glide circle by backing off the stab tilt. Throw at a little lower angle or with a bit more bank (go easy). If the model has a tendency to spin-in in the glide, add more wash-in to the wing.

If the model tries to spin in on the glide, add washin on the left wingtip. If the spin persists, reduce the left rudder tab.
If the glider goes way up, does 180-degree vertical reverse, slams straight back to earth, then add more "up" to the right side of the stab.
Problem: the model climbs to the right, but stays in the bank too long and loses altitude, still in a banked attitude before leveling off and turning left. Cure: too much decalage (angular difference between angles of attack of wing and the stab). Warp stab trailing edge down; or, warp right trailing edge of stab down and left trailing edge of stab up. A less-preferred cure is to add more left rudder.
Problem: the model climbs straight or to the left and does a Dutch Roll; and, when you try to correct this by using a sidearm throw, the glider now banks sharply to the right and goes into a shallow banked climb. The glider now banks sharply to the right and goes into a shallow banked climb. The glider seems to alternate between the two extremes. Cure: fin is too small. Possibly, the glider has too much dihedral.
If the glider goes up in a proper spiral, then falls off at the top and stalls: difficult solution, but initially try a tweak more right tab at the bottom of the fin (ZWIEBOX) or a smidge more "down" on the left side of the stab.
If the glider does everything almost perfectly, but spins to earth at the slightest upset: maybe the CG is too far aft, but more likely the left wing panel washin is too shallow.
If the model pulls out of the initial right bank, goes vertical and tends to barrel roll to the left and possibly runs out of oomph upside down, then tweak a little "down" into the right side of the stab.
The following trim scheme is from the CHALLENGER article and could be used as a starting point. It should produce a launch pattern almost vertical in attitude, with a slight turn, maximum altitude, and a flick-out transition on top. Before flying, set up the model as follows: Bend the fin to the left slightly (Just bend the surface by squeezing the wood slightly between your thumb and finger, compressing the wood on the inside of the bend while stretching the wood on the outside. Bend the left side of the stab (rear) slightly down. Bend the right side of the stab up slightly more than the left side was bent down. The ZWEIBOX also uses this stab tweaking up/down. This contributes much to the flick rollout. If the model stalls in the glide, add a little clay to the nose. If the model dives (it shouldn't if you bent the stab up enough), bend the right side of the stab up a little more. If the model sweeps over on its back on the launch, there is too much up on the right side (or not enough down on the left side). Throw again and adjust until the model is going almost straight up. If there is not enough left rudder, the model will go too much to the right and have a very wide glide circle. The model has to go slightly to the right on launch to get a proper transition. Too much washin in the left main panel will lift the wing on launch, making transition difficult and increasing the glide circle. Keep adjusting the stab and rudder to control the launch; add or remove noseweight to control the glide. A full-power launch is almost vertical at 75-degrees to 80-degrees with slight tilt to the right, and almost overhand. If it is launched too near the vertical, it will come over backwards with usually poor transition. If the model, on a proper launch, sweeps back or even loops near the top, this means too much up-bend on the right side and/or increase the down-bend on the left side. if the model comes into the transition a little shaky, makes a fast run, and loses a little altitude before settling into its proper glide, it

can usually be corrected by any or all of these adjustments: bend the right stab up a very small amount, decrease the down-bend on the left stab slightly, remove a small amount from the washin tab, or reduce the left rudder bend slightly.
An alternative trimming scheme is a little bit of washin in the right inner wing panel, stab tilt for a left glide, and a bit of right rudder tab to prevent the model from spinning in when in a thermal. This technique is used by Martyn Cowley (GOLDRUSH). Martyn says that it may sound like a spiral dive waiting to happen, but that it is great for trimming the throw part of the climb-just like a Power model, rolling left while turning right. (from CIA Informer, Jul/Aug 96)

1998 U.S.I.C

These are the results that were not published in issue 94

Coconut Scale

1.	Michelle Boyd	General Aristocrat	2:51
2.	Tim Lavender	Verville Air Coach	1:54
3.	Robert Stevens	Lockheed Vega	1:51

Pistachio

Pl	Name	Model	Scale	Flt.	Total
1.	Tim Lavender	Mess't M-20	2	1	3
2.	Emil Schutzel	14 bis	1	3	4
3.	Doc Martin	Goldwing	4	2	6
4.	Ed Ripley	Wee Bee	3	5	8
5.	Rich Miller	Sperry Jenny	4	4	8
6.	W. Henderson	Longster	3	8	11
7.	Ed Ripley	Sperry Jenny	4	7	11
8.	Bill Hiscock	Stinson SR-7	4	9	13

Golden Age FAC
(Total 3 unlimited flights)

1.	Mike Thomas	J-5	619
2.	Jack McGillivray	Moth Minor	590
3.	Rich MacEntee	Bellanca	400
4.	Chris Brownhill	Robin	309
5.	Jenny Plassman	Piper	279
6.	John Blair	Waco	211
7.	Wayne Anderson	Focke-Wulfe	124
8.	Robert Stevens	Lockheed Vega	117

FAC Scale

1.	Rich Miller	Curry Wot	160.5
2.	Jack McGillivray	SE-5	159.5
3.	Wayne Anderson	ME-105	149.5
4.	Chris Brownhill	Lacey M-10	142
5.	Rich MacEntee	Waco	140.5
6.	Chris Brownhill	Robin	136.5
7.	Wayne Anderson	BV 14113	121

FAC Peanut

Pl	Name	Model	Sc.	Bst.	Bon.	Total
1.	Rich MacEntee	Lemberger	66	80	15	161
2.	Doc Martin	Ansaldo	70	54.4	15	139.4
3.	Chris Brownhill	Lacey	56	82.5	0	138.5
4.	Doc Martin	Curtiss	51	62.7	10	123.7
5.	Bill O'Dell	Davis DA2A	55	26	10	91

Modern Civil Production
(total of 3 flights)

1.	Jack McGillivray	?	374
2.	Marcus Conner	Volksplane	195
3.	Rich Miller	Vagabond	154
4.	Bill Landrum	Turbo Porter	118

NEWS!

For Immediate Release—New Book
Hummelstown, PA—September 21, 1998

Flying Models — Rubber • CO_2 • Electric & Micro Radio Control

by Don Ross

We are pleased to enclose a "hot-off-the-press" copy of ***Flying Models — Rubber • CO_2 • Electric & Micro Radio Control*** by Don Ross. We are excited about this, the companion to Don's ever popular ***Rubber Powered Model Airplanes***, which has become a classic in the hobby.

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Micro R/C—What to buy, how to use.
New Materials—For building and covering. Add strength without weight.
Foam Sheet Construction—Light, Strong, Fast and Easy.
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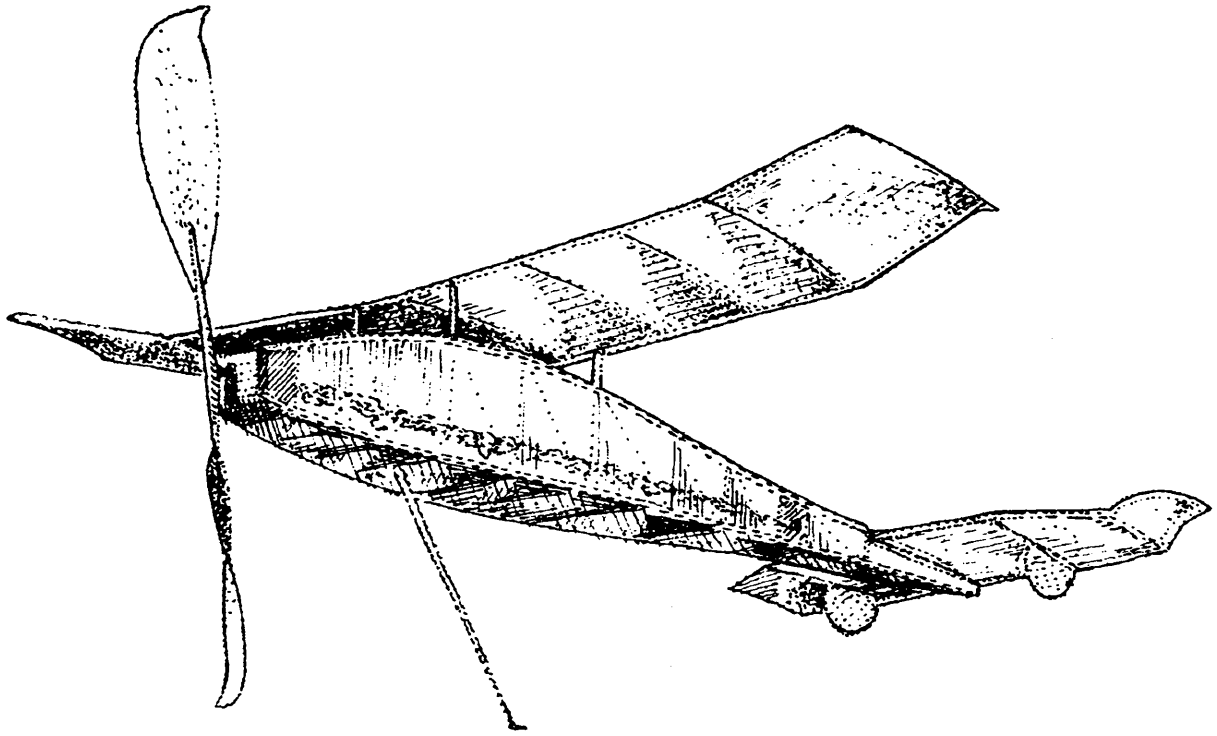
–Frank Fanelli, Editor, *Flying Models Magazine*

PUBLICATION DATE: 9/7/98
ISBN: 0-938716-54-9

Price: $19.95
Size: 5 ¾" x 8 ¼", 240 pages

For more information, contact Stephanie Brown @ Aviation Publishers
(717) 566-0468 fax anytime (717) 566-6423 or e-mail AviPub@aol.com

INAV
#96
March 1999



"JOKER"

Manhattan Cabin

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BOB BAILEY'S REPLY TO NICK LEONARD'S COMMENTS IN ISSUE 95 – NOVEMBER 1998

I would like to comment on Nick Leonards report in Nov. '98. INAV, which I read with great interest having flown at Slanic myself in the World Championship.

We were fortunate in preparations at Cardington when the first two meetings in April gave conditions which were very similar to Slanic in terms of temperature and humidity. Torque levels were not greatly different.

I was also flying an unbraced model but with a bigger wing than the "stork" (8 ¼" chord) and got the impression from the original test that with 4"wing post the model was liable to tuck in due to excess wing wrap. I therefore shortened the wing post to 3 ¼" to ensure a bit of extra safety margin for flying at Slanic.

My models were flown to the maximum torque anticipated for Slanic and no trim problems were encountered there.

From Nick's descriptions of his problems on the last day, it seems very likely that a key joint on the wing spars to wing posts or Wing posts to fuselage was weakened! This could have happened during steering.

To test a joint, hold one component very close to the joint and put a load on the other. No rotation of the second component relation to the first should be visible. Without stiff joints, the unbraced model has no chance of handling high torque.

Incidentally, I ensured that the wing posts have a circular cross section in the motor stick since I had trouble with mounting the slim boron, braced posts. The reason was to ensure a stronger joint, which is also stiffer. The stick wood (rectangles) squashes more easily sideways than from the front to rear.

Regarding the effect a torque on wing warp, the length the post is not revelant, provided they do not bend unequally. It is the angular change (tension) that is the critical parameter, and here, a small diameter motor stick is bad news! With a bigger wing chord the angular change is bigger.

Why do I fly unbraced models? The reason is that I never managed to avoid damage in international travel with braced models; I always was successful in finding a wrong way of setting them up in the box. This experience culminated in my arrival at Johnson City in 1990 with two fuselages and two propellers, having started and with 4 complete aircraft! I didn't touch FID for the best part of 2 years after that, and vowed not to build a braced FID again.

The unbraced models are easy to transport, as Nick Leonard knows well, they are easy to repair (no wire to get in the way) and are, I believe, fully competitive.

Steve Brown's models have one great advantage...Steve Brown flies them!

I hope that Nick has a rethink before ditching the unbraced models; he will exchange one set of problems for a substantially different set! "I've been there and done that"; to use a well warn phrase in Britain.

Bob Bailey

Covering Indoor Models
Using the Thinner Covering Films

This article will cover using Polymicro II or the new Y2K films to cover indoor models. The newer films are more delicate than previous films and so demand new techniques to get good results.

The first step in using the plastic films for covering is to make a covering frame. Basically a covering frame is a pair of rails that the covering is glued to that hold the film while a structure is lowered onto the covering. A method of adjusting the rails in relation to one another is needed to produce the slack that allows the structure to be covered without the film being too tight. Any simple system to allow one rail to be adjusted will work. One method is to use 1/4" X 1 1/2" X 24" hard balsa rails that have two slots cut into each of them 2" from each end and in the middle of the 1 1/2" face. The slots are cut to be a tight fit for 1/4"X 1/2"X 7" spreader pieces that tie the two rails together. Once the rails have the spreader pieces inserted into them the position of the rails can be adjusted by simply pushing the spreaders into or out of the slots until the desired film slack is achieved and any diagonal wrinkles are removed. A better but more elaborate system is to build a pair of rectangular frames from 1/8" X 1/2" X 35" as shown in the diagram. These are joined by 1/8" X 3" X 7" hard balsa crosspieces along the bottom only. This leaves the upper rails of the frames very flexible. A set of five turnbuckles are used to adjust the width and diagonal tension on the upper rails. These upper rails are the ones used to hold the film. Three of the turn buckles go across the frames, one in the center and one at each end. The other two turnbuckles are set up along the diagonals of the frame and are used to adjust the diagonal wrinkles out of the film. This frame is more permanent and more versatile than the frame first described, although both do a good job.

Getting the film off of the card tube is not a trivial job, especially the new Y2K film. Gene Joshu discovered very recently that if you unroll the film out onto a large piece of the foam rubber used in furniture upholstery a very large part of the static that plagues this material is eliminated. Once the film is unrolled to the desired length a piece of cardboard is placed under the film at the desired cut off point. A hot soldering iron of about 15 watts is recommended for film cutting and trimming. Once the film has been cut you can further eliminate static by gently wrinkling the film by rolling it up into very loose ball about 3" in diameter and massaging it gently with the fingertips for a minute or so. Do not roll the ball too tight, this can ruin the film by bursting small air bubbles. Gently and slowly unravel the film onto a smooth matte surface such as a piece of cardboard or Formica. If you are using the new Y2K film you must go very slowly and be very careful not to pull to hard on any one bit of film since this film will tear very easily. Your fingers must be absolutely clean and glue free or the smallest bit of glue on them will start to tear the film. The same is true of all the other items that may touch the film. To help spread the film out evenly and to get the air out from under it you can blow very gently down onto the film, forcing the trapped air out. This job is finished by smoothing the film out with a very soft watercolor brush, or a mascara brush. If a

drafting brush is used you must be careful to always draw the brush with the bristles sweeping back. If this type of brush is used with the bristles being pushed the ends of the hairs will tear many small holes into the film. Work with the film until it is well flattened and looks tight with no wrinkles. It is now ready to have the frame glued to it.

The glue that works best for attaching the film to the covering frame is the Prang Glue Pen from Office Depot. This is a very slow drying liquid glue that will allow a small amount of adjustment to the edges of the film to help you remove wrinkles. Glue stick can also be used if the area of the frame is not too large. Once the film is attached to the frame the whole thing is turned over and inspected for diagonal wrinkles or loose spots. Small placement corrections can be made by sliding the film on the still moist adhesive. The object is to get the film tight and wrinkle free on the frame before you use the adjustability of the frame to get the needed slack in the film. An inch of extra film on the outer side of the rails will make these placement corrections easier.

Now that you are ready to cover the model there are some things you can do to make the covering job better. If you are covering a very light structure like an EZB wing you will want to add a handle device to hold the wing spars straight and so that you will have something to hold onto as you place the wing into position on the film. This handle is constructed of a piece of 1/32" X 3/4" X 18" medium balsa with 1" balsa fingers spaced to hold the spar between the ribs. The ends of the fingers are glued with a very small dot of ambroid cement to the trailing edge spar. With six or seven fingers the spar will be very straight. The ribs will hold the front spar straight since the back spar is straight. The handle is glued with a slight droop, like the flaps on a conventional plane. This will allow you to easily place the wing onto the film with precision.

Now you place the wing onto the film without any adhesive to see if there is enough slack to allow the leading and trailing edges to meet the surface of the film. If it is too tight the wing will just rest on the tops of the ribs. If it is too loose the covering will have a great number of wrinkles, especially at the tips. Adjust the frame rails so that the entire wing rests on the film. It is better to error on the side of having the film too loose.

The wing is now turned over so that the glue can be applied to the top surface. Before the spray is sprayed you must cover the handle and fingers with drafting tape so that the spray is not applied to the handle.

The adhesive of choice is 3M #77 Sprayment, buy the larger can since it is much less expensive this way. This stuff is very sticky, do not use it near anything you do not want to stick things to. To apply the spray to the wing you need an area with a dark background and strong sidelighting. This will allow you to see the spray as it floats on the air. Holding the wing by its handle in your left hand, spray a small cloud of sprayment into the air and immediately pass the wing through the cloud so that the top of the wing picks up the spray. Repeat this step several times until the entire wing is thoroughly covered. You

can test any questionable area with a small ball of scrap film. Just touch the ball of film onto any parts of the spars you think may not have enough spray on it. If the ball show any tackiness that area is OK. Once the wing has been sprayed take the drafting tape off of the model. Do this by holding the wing vertically by the handle and pull the tape down across itself. This will automatically pull off the drafting tape from the fingers as well.

It is best to get the wing onto the film fairly quickly once you have sprayed it with glue. Since you let only the very finest glue particles settle onto the structure this glue can dry out pretty fast. As long as you can get the wing onto the film in four or five minutes you will be fine. The covering should be done in an area with very good light so that you can tell just how to place the wing. Be very careful to put the wing onto the film right where you test fit it before gluing. Use the handle to get it just so before letting it touch the film. One good method is to rest the fingers of the handle on the rail nearest you with the wing tilted up and clear of the film. The handle is then slowly raise which lowers the wing down onto the film. Remember that you will not be able to easily lift it once it is down so position it carefully before you put it down onto the film. A possible error is to let a tip or one end of a spar touch in the wrong place and then try and force the wing back into place. If this happens you can lift the wing back off of the film by using a small clean brush with clean acetone to unglue the offending area. Placing the wing on the film is not that difficult, it just needs to be done carefully to get superior results. With the wing in place on the film you can gently push any parts that are not attached well down onto the film surface. Simply run your finger around the outline to make sure you are down everywhere. Look carefully and gently poke here and there until you are certain that you are attached everywhere. If there are any areas that you simply did not get any glue on you can take a solution of rubber cement thinned with the proper thinner and fix it. By using a very small, soft paintbrush you can apply a very small amount of glue to fix the offending area. The cement should be extremely thin, perhaps 10 to one or thinner. Any area where you had to use this extra glue you must allow to dry for a good while before the next step. If you do not need to add this glue anywhere you are ready to trim the wing.

A very low power soldering pencil is a good tool to use for trimming the new films. Do not use a medium or large iron as this will have too much heat coming off of the element. This can tightly shrink the film in very localized places and really mess things up. I use a 12-watt iron and often have to unplug it for moment or two to keep it from getting too hot. Also, never trim from under the film as the heat will rise and the film may collect hot air underneath until something goes bad. Trim from above and keep the iron moving. When the film is trimmed from around the wing several small tabs of film are left uncut to hold the wing in place. Once the majority of the film has been trimmed from the wing outline these tabs can be trimmed with the iron while the wing is held by the other hand. This way when the wing comes loose from the film it will not shift and reglue itself to the remaining film on the frame. Clean the tip of the iron frequently during your covering sessions to insure the very best cutting action.

Once you have the wing trimmed all the way around you can give the outline one last very careful inspection. You are looking for anyplace that the film is not attached. If you find any areas that need it you can use the thinned cement to fix them. Use this glue very sparingly. Allow the wing to dry completely so that if the wing touches some other film covered part in your model box it will not stick to it. The above method will work with stabs and other flight surfaces on typical indoor models. Most structures other than the EZB wing do not need the handle to straighten then, but it is a very good way to get any structure down onto the film with good control. I beats the method of "dropping" the structure onto the film and is very much better than trying to use your fingers.

NOTE:

We still have a bunch of the new Y2K film for sale. This film is just over half the weight of Polymicro II and shows some very nice colors. Due to the limited amount of this film we are allowing a maximum of two rolls per person. The film is about 14" wide and 20 feet long on each roll. The price is $33.00 post paid in the US and Canada and $36.00 US post paid to any other countries.

Send Payment to:

Y2K Film
4514 Meadowlane
Red Bud, IL 62278

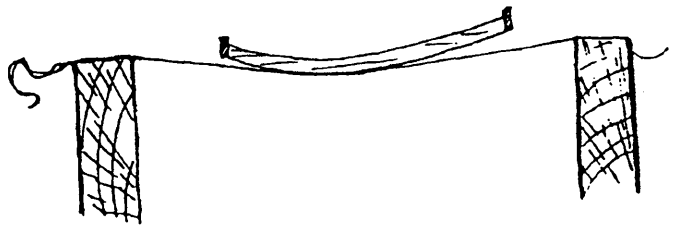
Please remember the two roll limit!

The Y2K Film Fund to Help Support Junior and Senior Contestants at this Years AMA/USIC

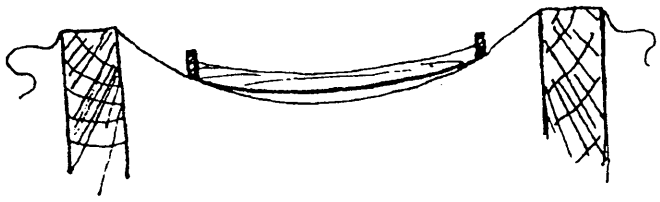
Juniors and seniors who fly at this years AMA Indoor NATS/USIC at Johnson City will have their contest entry fees paid by the Y2K Film fund. To receive the sponsorship the junior or senior contestant should send a copy of their entry forms to:

Y2K Film
4514 Meadow Lane
Red Bud IL, 62278

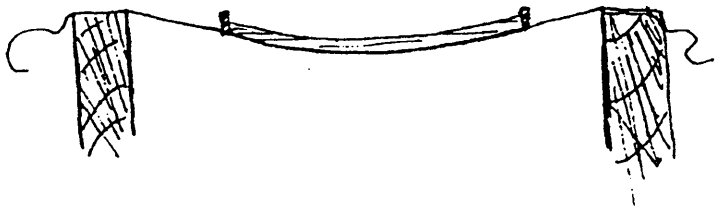
Note: Those wishing to take advantage of this sponsorship should make certain that the copies of their entry forms are sent in time to pay the fees. The sponsorship does not extent to paying any late entry fees what so ever.



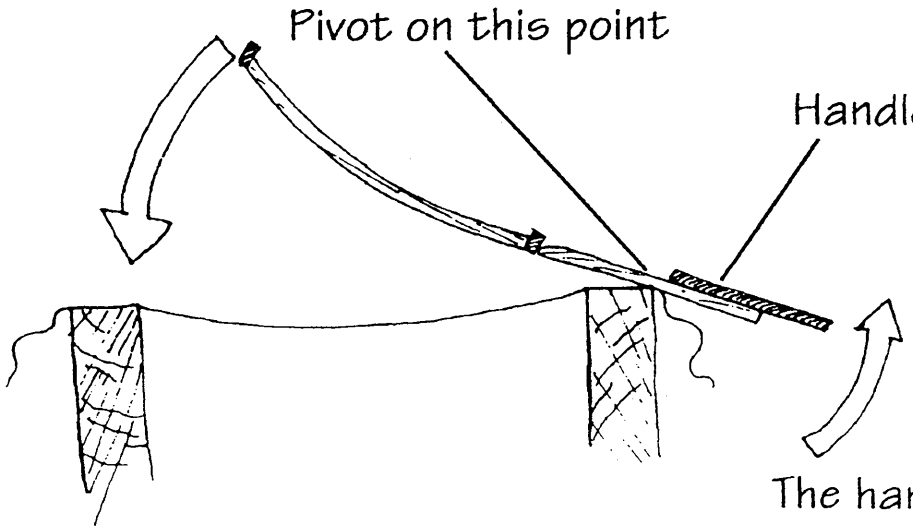
If the wing fails to touch everywhere along the spars the film is too tight on the frame



If the spars touch the film but the ribs do not, the film is too loose on the frame

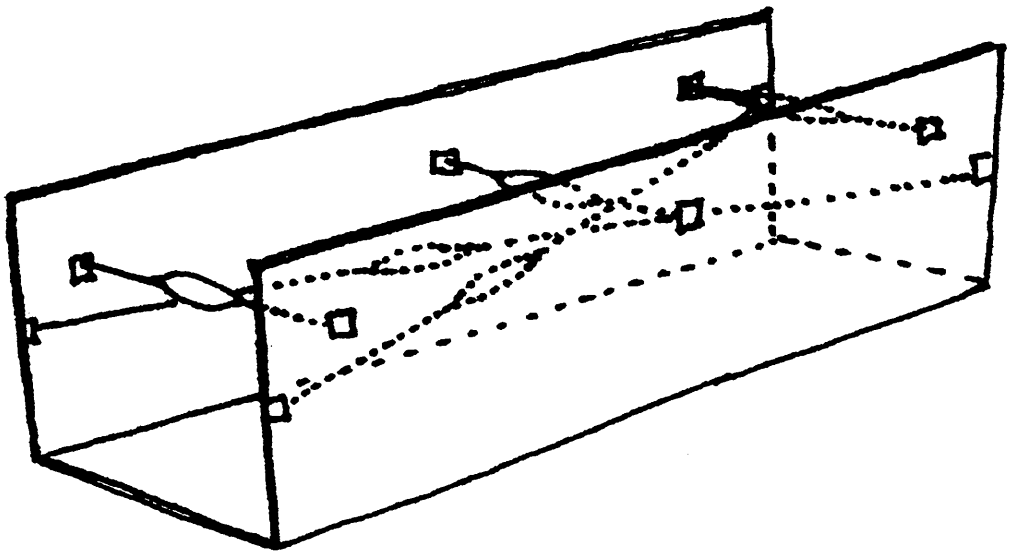


When the spars and the ribs all rest on the film the slack is perfect



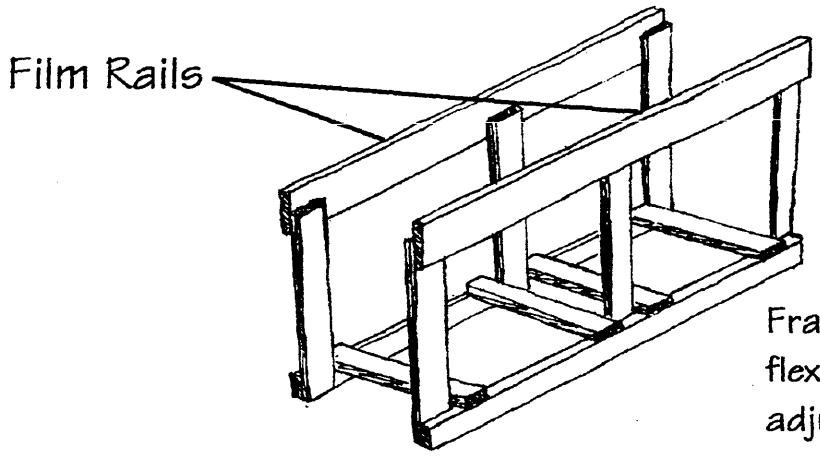
The handle is rocked on the edge of the frame to allow the wing to meet the film very evenly

Larry Coslick's
Adjustable Film Frame



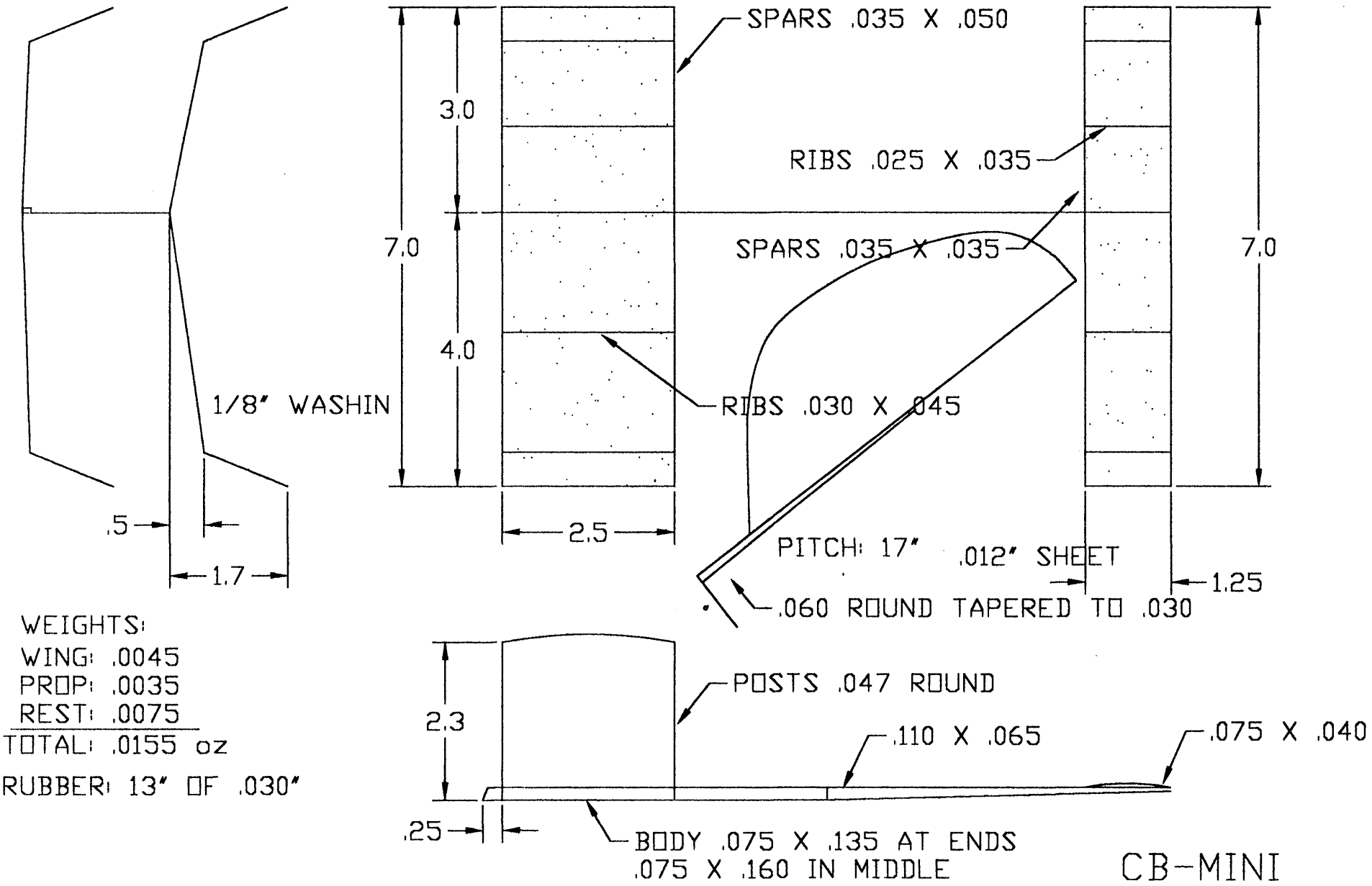
This view shows the arrangment of the turnbuckles that are used to distort the flexable frame and so adjust the film slack and remove any unwanted wrinkles.

Five turnbuckles are used, three crossing the frame to adjust the film slack and two diagonals to help remove any wrinkles.



Frame is built with enough flexability to allow easy adjustment

The frame is made up of 1/8"X 1/2" basswood rails and 1/4" X 3/8" basswood uprights and crossbraces. Size the frame to handle the largest model you expect to build. The film is attached across the top of the rails with liquid gluestick.

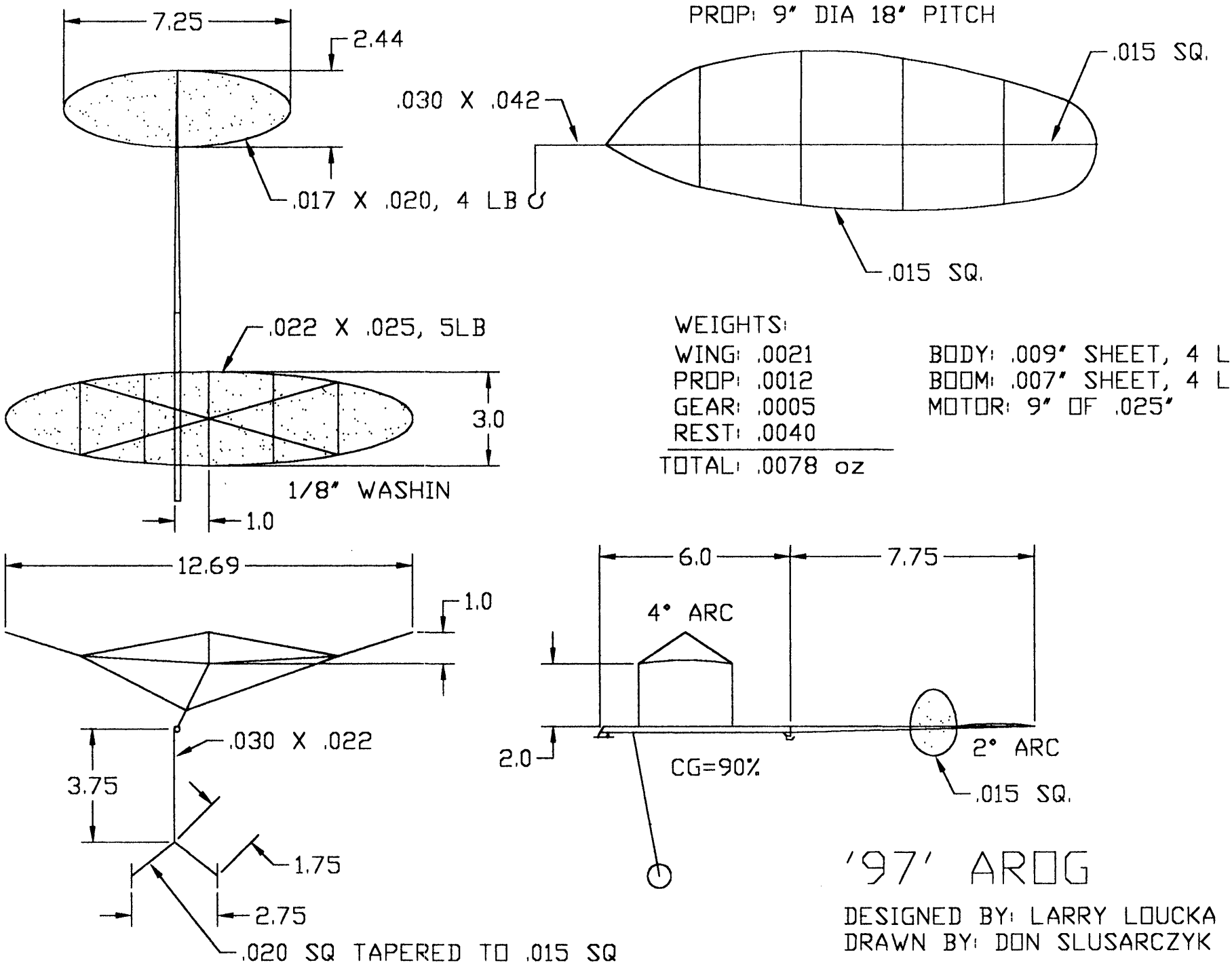


WEIGHTS:
WING: .0045
PROP: .0035
REST: .0075
TOTAL: .0155 oz

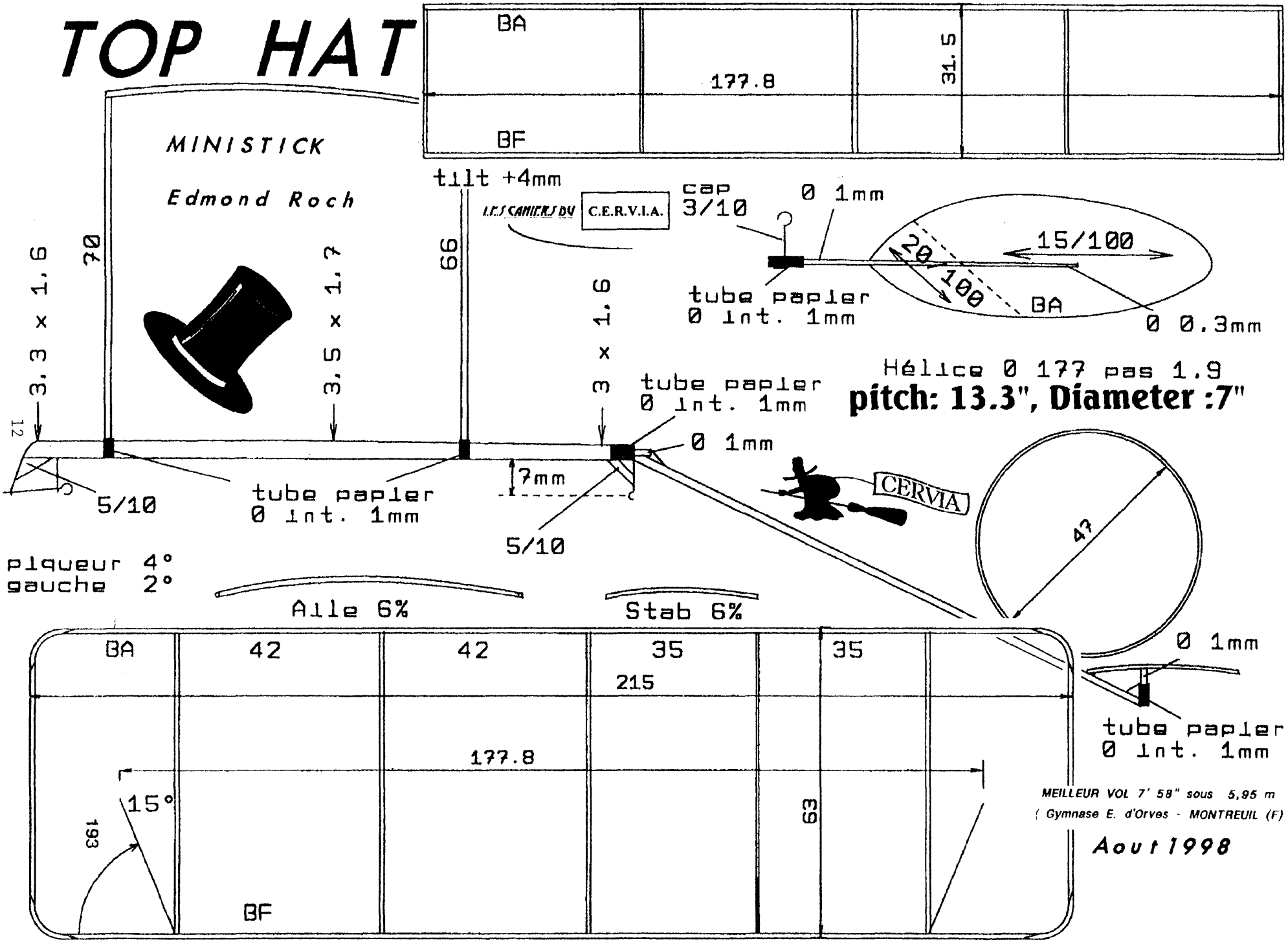
RUBBER: 13" OF .030"

CB-MINI

DESIGNED AND DRAWN BY:
DON SLUSARCZYK

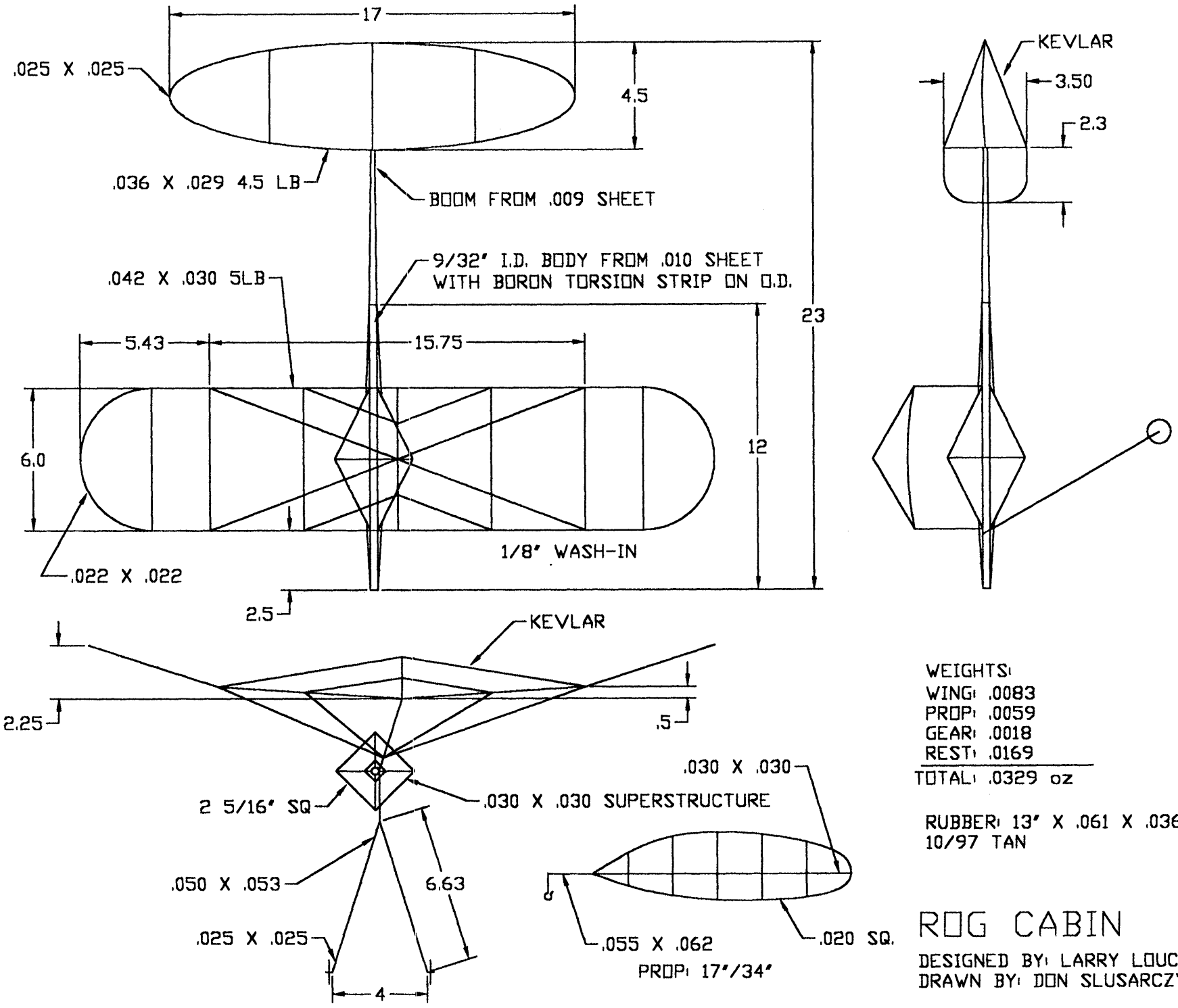

7.25
2.44
.030 X .042
.017 X .020, 4 LB
PROP: 9" DIA 18" PITCH
.015 SQ.
.015 SQ.
.022 X .025, 5LB
3.0
1/8" WASHIN
1.0
WEIGHTS:
WING: .0021
PROP: .0012
GEAR: .0005
REST: .0040
TOTAL: .0078 oz
BODY: .009" SHEET, 4 LB
BOOM: .007" SHEET, 4 LB
MOTOR: 9" OF .025"
12.69
1.0
.030 X .022
3.75
1.75
2.75
.020 SQ TAPERED TO .015 SQ
6.0
7.75
4° ARC
2.0
CG=90%
2° ARC
.015 SQ.
'97' AROG
DESIGNED BY: LARRY LOUCKA
DRAWN BY: DON SLUSARCZYK

TOP HAT



MEILLEUR VOL 7' 58" sous 5,95 m
(Gymnase E. d'Orves - MONTREUIL (F)

Aout 1998

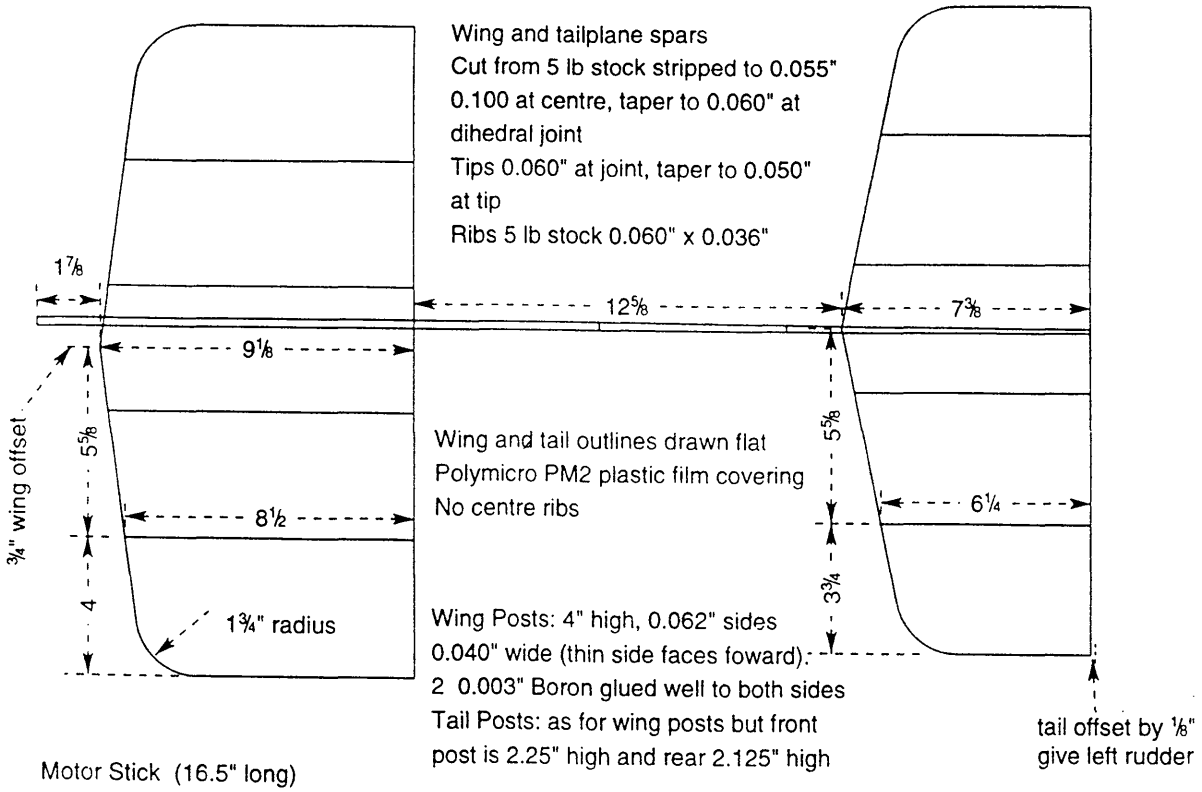


WEIGHTS:
WING: .0083
PROP: .0059
GEAR: .0018
REST: .0169
TOTAL: .0329 oz

RUBBER: 13" X .061 X .036 oz
10/97 TAN

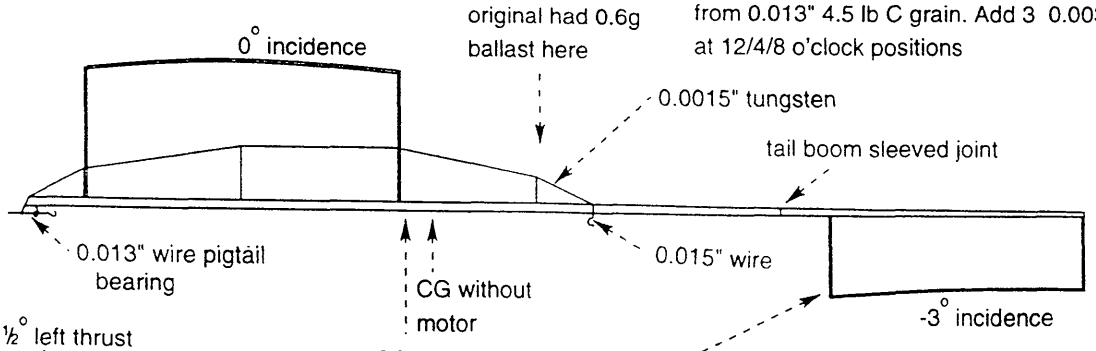
ROG CABIN

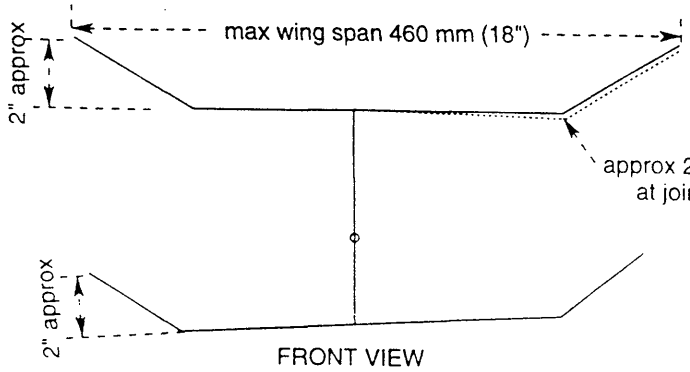
DESIGNED BY: LARRY LOUCKA
DRAWN BY: DON SLUSARCZYK



Motor Stick (16.5" long)
Formed over 0.25" alum former, from 4 lb 0.018" C Grain. Add 4 0.004" Boron at 12/3/6/9 o'clock positions

Tail Boom (14.5" long)
Formed on Ray Harlan tapered boom former, from 0.013" 4.5 lb C grain. Add 3 0.003" Boron at 12/4/8 o'clock positions

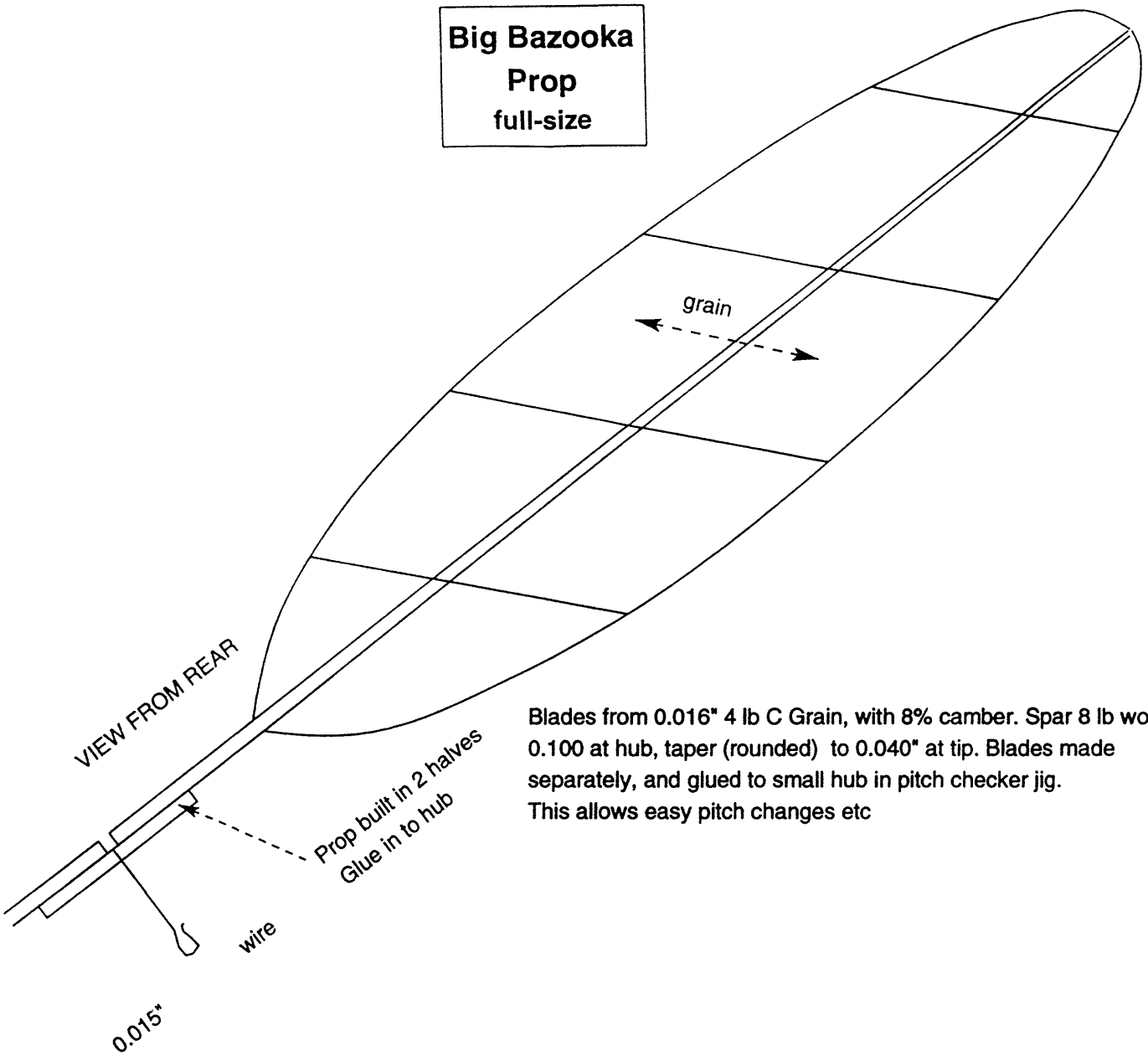




WEIGHTS	grams
Wing	0.623
Tailplane	0.675
Motor stick	0.397
Tail boom	0.170
Prop as shown	0.562
Total airframe	2.409
Ballast	0.601
Flying weight	3.100

Big Bazooka
F1M (F1D beginner)
by Laurie Barr

FFn Scale 1:5 All dimensions ins



Blades from 0.016" 4 lb C Grain, with 8% camber. Spar 8 lb wood, 0.100 at hub, taper (rounded) to 0.040" at tip. Blades made separately, and glued to small hub in pitch checker jig. This allows easy pitch changes etc

BIG BAZOOKA F1M (F1D BEGINNER) BY LAURIE BARR

This is my first shot at this class of model, and it has proved to be easy to build and fly. Future developments will include a VP prop to avoid wasting so many back-off turns, possibly making prop 17" dia.

Ribs pre bent inside male/female bandsawed jig, with 3/8" camber. Soak well. Clamp between top/bottom of form with bands, microwave for 1.15 mins at 750 Watts. run sheet through stripper to desired width.

Given a high enough ceiling, and/or a VP prop, I believe this model will fly for 21 minutes. It came 2nd at the USA Indoor Championships, in Johnson City USA, and it won the British Indoor Nationals F1M indoor beginners class, with a flight of 20 min 12 sec.

Easy EZB Props

I used to hate EZB props. I had EZB prop envy. I would follow directions to the letter, using the best wood I could get, and end up with a waffly, wavy prop weighing around 150 mg. My props were the worst part of my EZBs and I did not like any of the first dozen or so I made. My models would kind of bob through the air as the prop shuffled along. There just had to be a great deal of wasted energy in all that wriggling around. After a while I got better at it, but I never actually liked any of my props. I had trouble getting wood I considered adequate, and I always managed to come out with wavy edged blades once the prop was finished. The blades would come off of the form so pretty and nice. Beautiful curves with perfect edges. Glue them to the spar and in a few days they were like all my earlier ones. No fun at all.

It is kind of funny how things gel all at once. At one of the regular local flying sessions Larry Coslick showed up with an EZB prop dyed red and blue. The color edges were perpendicular to the prop spar, and I gave it a pretty good look to see how he did it. It turns out he dyed the wood before he made up the prop blank so that each piece was a different color. Larry had put the grain straight across the blade from edge to edge instead of the diagonal direction. He had also used very thin A grain balsa. By using a bit more substantial spar he had gotten by with using wood you would never have considered for the prop. I had some of that stuff at home! All I had to do was to sand it to thickness. I made up some blade blanks using my regular ambroid and lacquer thinner. After cutting them out I was worried. Such flimsy things! They just could not make workable blades, no way in the world. Even if they were OK off of the form, my gluing them to the spar was sure to ruin blades this thin. So glue the blades to the spar first! Who said that! Who cares, try it. I quickly slapped the spar onto the blades using ambroid. Normally the blades are glued to the spar with aliphatic so as to eliminate the warping from shrinkage of the glue. I figured that I was going to flatten the blades after any warping the spar gluing was going to do so I went ahead with the ambroid. Besides, I had to use waterproof glue so that the prop blades would not end up glued to the form. I cut a quick groove into the form for the spar and made my balsa sandwich. Twenty minutes in the oven at 220 and TaDa! A very nice, pretty, perfectly formed, and obviously strong and stiff enough prop blade. My best ever blade formed from wood sanded down out of 1/32" A grain balsa. Three different ideas all tried together worked out perfectly. I made four props in the next 12 hours, each better than any I had made up until then. Average weight was 125 mg using 5-pound wood and very strong spars. I like these props. Give this method a try and see if you like it too.

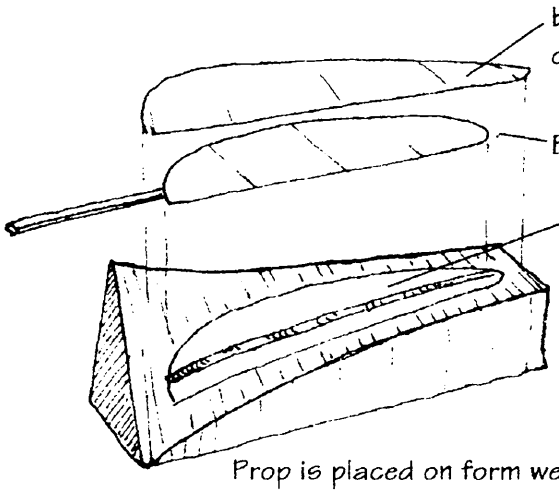
Start with some four pound 1/32" balsa (100-mg props) in any cut of grain you have. If you have some really nice C grain save it for Penny Plane props. One of the secrets to sanding wood down to usable thickness is to use very coarse paper to start with and do not push hard at all. If you start with too fine a paper you will have to press down pretty firmly to get it to cut fast enough. This compresses the wood fibers and drives up the density. What you get is five and a half pound wood that makes a heavy prop. If you use a very coarse paper and

very light pressure you will keep the density down and the prop light. You still finish up with very fine paper, but NO pressure. A block with 280 paper using a pair of wraps of masking tape to space the face of the paper above the board makes a nice tool for getting the wood to its final thickness. Once you start sanding the wood you need to be extra careful not to crunch the wood. Sand in one direction, away from the hand holding the sheet against the table. Let the tooth of the paper do all of the cutting, do not press down! Balsa this thin is very much like a bundle of drinking straws. If you push down on the bundle you will collapse the straws and so crease the walls of each tube forming a flattened oval. Not only will the density go up, but also the collapsed tubes will have less stiffness and the wood will be very limp. To help "revive" the wood he sands, Larry Coslick has a trick where he washes the wood after sanding. This removes the imbedded balsa dust from the grain and helps expand the tubes the wood is composed of back to their original shape. He sands down to about .006" and after washing the wood returns to about .008" and is quite a bit stiffer.

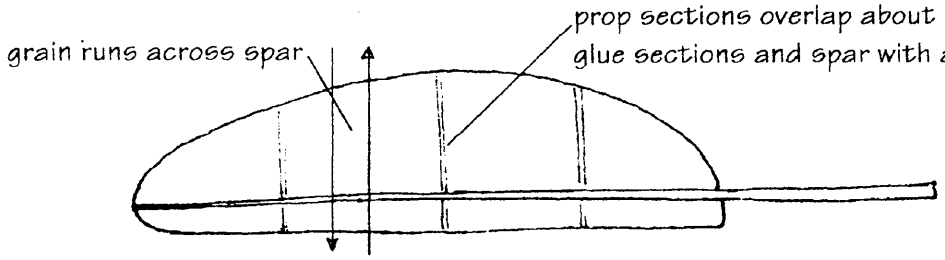
Once you have some nice wood sanded (it will seem far too limp, but do not worry) you can go ahead and use you prop template to make the prop blanks. I use very thin Ambroid to glue the section together, overlapping them about .020" or less. Cut the spars to size and glue them into place with the same thinned glue. Be careful not to use too much glue here, and to not get glue where you do not need it. You will find that gluing the blades to the spars before they are formed is much easier to do than the regular way. Note that the spar runs out to the very tip. This is necessary due to the direction of the grain of the prop blank. Let the prop halves dry before putting them onto the form.

You will need to cut a groove for the spar in the camber form you are going to use on the prop form. Be sure it is deep enough along its entire length. Wet a prop half and place it onto the camber form, then place the camber form and the cap used to prevent damaging the blades onto the prop form and wrap with carpet thread. Bake the whole thing in a 220-degree oven for around 20 minutes. Let the form cool a bit before unwrapping the prop half. You should have a very nice looking prop blade with just a bit of curl (like the prop is under a load) and prefect pitch twist. Make the other blade and join using a wedge as shown in the illustrations.

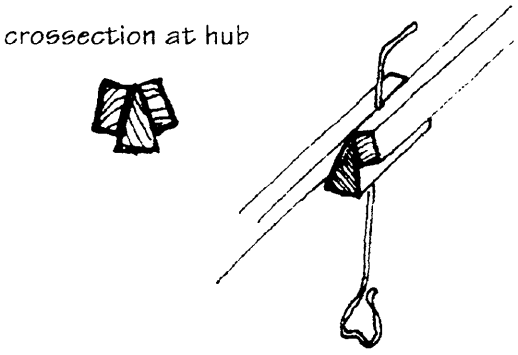
The resulting propellers will hold the blade twist very well and the blades made this way are very close to identical.



Prop is placed on form wet and the cap is positioned then the whole is wrapped with cotton cord and baked for 20 minutes at 220 degrees



prop spar runs all the way out to the tip
.045"X.055" tapering to .025" square at tip



Because the spars are glued flat to the blades they must attach to the hub at an angle. A wedge of firm balsa serves as the hub as shown.

FORTY MINUTE CLUB

JANUARY 1999

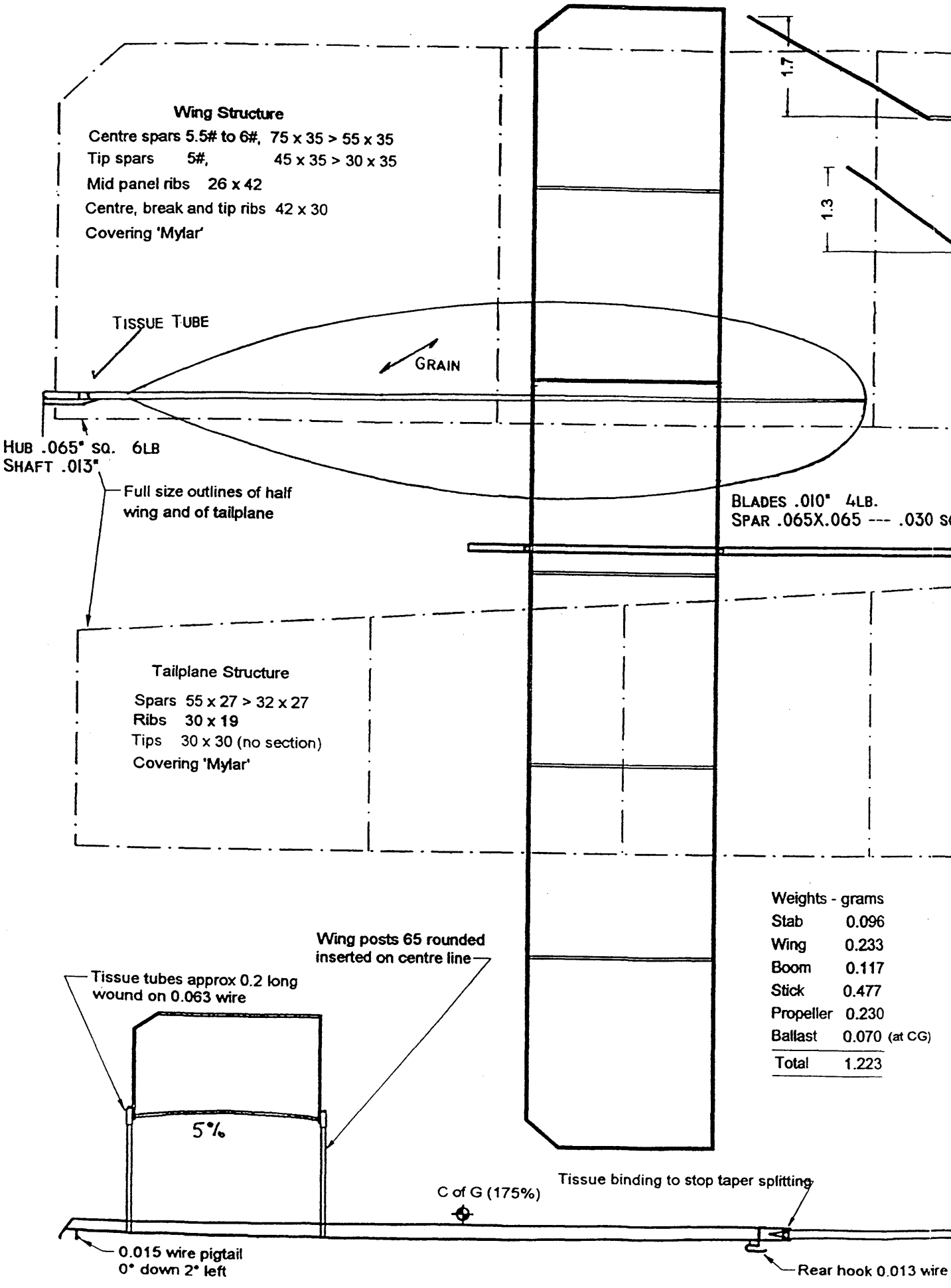
NAME	COUNTRY	TIME	1*	2*	YEAR	SITE
BROWN, STEVE	USA	63:54	X		1996	SANTA ANA
RICHMOND, JIM	USA	56:35	X		1996	AKRON
RANDOLPH, BOB	USA	55:06	X		1993	SANTA ANA
BROWN, STEVE	USA	53:45		X	1997	SANTA ANA
ASLETT, BERNARD	UK	52:22	X		1983	CARDINGTON
UNDERWOOD, GARY	USA	51:58		X	1996	LAKEHURST
ROBBINS, HERB	USA	51:36	X		1998	SANTA ANA
KOWALSKI, DICK	USA	50:41	X		1976	AKRON
DOIG, RICH	USA	50:41		X	1995	AKRON
BANKS, CEZAR	USA	49:50		X	1996	MOSCOW, IDAHO
RICHMOND, JIM	USA	49:44		X	1997	SANTA ANA
ROMAK, BUD	USA	49:35		X	1991	LAKEHURST
RANDOLPH, BOB	USA	49:31		X	1995	AKRON
BARR, LAURIE	UK	49:29		X	1996	CARDINGTON
HUNT, BERNARD	UK	49:07		X	1997	CARDINGTON
COSLICK, LARRY	USA	48:16		X	1997	SANTA ANA
SLUSARCZYK, DON	USA	48:10		X	1995	AKRON
BUTTY, RENE	SWI	48:01		X	1996	MOSCOW, IDAHO
KAGAN, JOHN	USA	47:58		X	1997	SANATA ANA
ROHRBAUGH, AL	USA	47:40	X		1997	AKRON
HARLAN, RAY	USA	47:13		X	1980	AKRON
GIBBS, BOB	USA	47:03		X	1998	SANTA ANA
TIPPER, JOHN	UK	46:45		X	1996	CARDINGTON
DOIG, RICH	USA	46:24	X		1983	AKRON
OTA, KENICHI	JPN	46:16	X		1996	MATUMOTO CITY
LOUCKA, LARRY	USA	46:14		X	1995	AKRON
CHILTON, STAN	USA	46:10		X	1994	AKRON
McGILLIVRAY, JACK	CAN	45:57		X	1996	MOSCOW, IDAHO
RODEMSKY, ERV	USA	45:50	X		1974	SANTA ANA
RIEKE, K. H.	GER	45:40	X		1962	CARDINGTON
MERKT, THOMAS	GER	45:27		X	1996	MOSCOW, IDAHO
REDLIN, CARL	USA	45:17	X		1962	CARDINGTON
REE, ANDRAS	HUN	45:13		X	1998	SLANIC PRAHOVA
ANDREWS, PETE	USA	44:59		X	1979	AKRON
ENOMOTO, HIDEYO	JPN	44:55		X	1998	MATUMOTO CITY
MATHER, CLARENCE	USA	44:44	X		1974	SANTA ANA
ASLETT, BERNARD	UK	44:37		X	1985	CARDINGTON
DE BATTY, BOB	USA	44:35		X	1996	SANTA ANA
NICOARA, VASILE	ROM	44:30		X	1996	MOSCOW, IDAHO
HULBERT, BILL	USA	44:27		X	1994	AKRON
HACKLINGER, MAX	GER	44:20	X		1961	CARDINGTON
NORE, PENTTI	FIN	44:01		X	1986	CARDINGTON
ANDRE, THEDO	NED	44:01		X	1986	CARDINGTON
KOPECKY, ERNIE	USA	43:42	X		1963	SANTA ANA
ROBBINS, HERB	USA	43:39		X	1995	SANTA ANA
ORSOVAI, DEZSO	HUN	43:37		X	1986	CARDINGTON
ALLEN, PAUL	USA	43:36	X		1974	SANTA ANA
KUJAWA, SYLWESTER	POL	43:35		X	1992	WROCLAW
MANGALEA, CORNELIU	ROM	43:30		X	1996	MOSCOW, IDAHO
CUMMINGS, FRANK	USA	43:28	X		1963	SANTA ANA
ATWOOD, BILL	USA	43:17	X		1963	SANTA ANA
THOMAS, MIKE	CAN	43:01		X	1996	MOSCOW, IDAHO
PLOTZKE, RON	USA	42:53	X		1969	LAKEHURST
FOSTER, JOE	USA	42:44		X	1987	SANTA ANA
SIEBENMANN, DIETER	SWI	42:33		X	1986	CARDINGTON
CAILLIAU, LARRY	USA	42:29		X	1985	AKRON
BAILEY, BOB	UK	42:28		X	1998	SLANIC PRAHOVA
DOMINA, DAN	USA	42:25		X	1979	AKRON
CANNIZZO, SAL	USA	42:20		X	1983	LAKEHURST
PYMM, DAVE	UK	42:03		X	1986	CARDINGTON
ROMAK, BUD	USA	42:01	X		1965	MOFFETT NAS
OBARSKI, DICK	USA	41:30		X	1981	AKRON
FINCH, TOM	USA	41:27	X		1963	SANTA ANA
KINOSHITA, SATOSHI	JPN	41:24		X	1993	TACHIKAWA CITY
CHAMPINE, BOB	USA	41:23	X		1963	SANTA ANA
RODEMSKY, ERV	USA	41:23		X	1979	AKRON
STOLL, ED	USA	41:21	X		1963	SANTA ANA
HOFFMAN, EARL	USA	41:13		X	1987	SANTA ANA
KIHARA, KAZUMASA	JPN	41:06		X	1998	MATUMOTO CITY
MATHER, CLARENCE	USA	40:54		X	1974	SANTA ANA
GANSER, RON	USA	40:53	X		1996	AKRON
DRAPER, RON	UK	40:44	X		1962	CARDINGTON
POPA, AUREL	ROM	40:42		X	1996	MOSCOW, IDAHO
BILGRI, JOE	USA	40:37	X		1965	SANTA ANA
NONAKA, SIGEYOSI	JPN	40:36		X	1978	CARDINGTON
STEVENS, DARRYL	USA	40:35		X	1986	SANTA ANA
SHEPHERD, JESSE	USA	40:33		X	1995	AKRON
DIHM, JAN	POL	40:21		X	1997	SLANIC PRAHOVA
LOTZ, RAINER	GER	40:20		X	1996	MOSCOW, IDAHO
GITLOW, LEW	USA	40:15		X	1987	SANTA ANA
MOSKALEV, VASILI	UKR	40:15		X	1996	MOSCOW, IDAHO
KALINA, JIRI	CZE	40:11		X	1975	CARDINGTON
RODENBURG, OTTO	NED	40:11		X	1986	CARDINGTON
TRIOLO, JOHN	USA	40:06	X		1974	LAKEHURST
MZIK, LARRY	USA	40:01		X	1995	AKRON

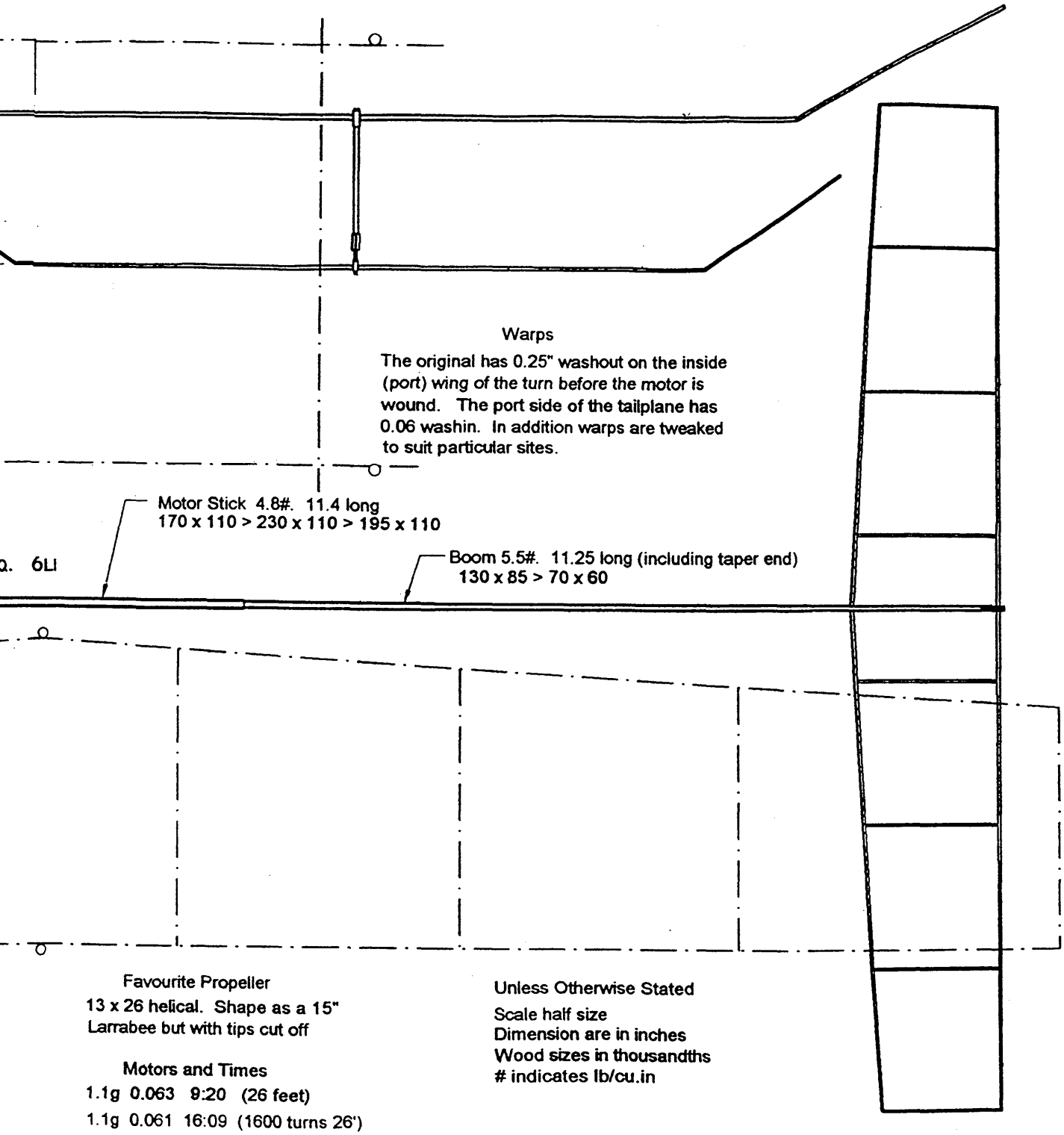
*CLASS 1 – Over 65 cm CLASS 2 – FAI 65 cm – 1 gram

Official and unofficial flights included (best effort only, by individual, by class is shown).

For additions, corrections, etc. send details to:

BOB GIBBS 22870 Springmist Drive, Moreno Valley, CA 92557 USA


Wing Structure
Centre spars 5.5# to 6#, 75 x 35 > 55 x 35
Tip spars 5#, 45 x 35 > 30 x 35
Mid panel ribs 26 x 42
Centre, break and tip ribs 42 x 30
Covering 'Mylar'
1.7
1.3
TISSUE TUBE
GRAIN
HUB .065" SQ. 6LB
SHAFT .013"
Full size outlines of half wing and of tailplane
BLADES .010" 4LB.
SPAR .065X.065 --- .030 S
Tailplane Structure
Spars 55 x 27 > 32 x 27
Ribs 30 x 19
Tips 30 x 30 (no section)
Covering 'Mylar'
Weights - grams
Stab 0.096
Wing 0.233
Boom 0.117
Stick 0.477
Propeller 0.230
Ballast 0.070 (at CG)
Total 1.223
Wing posts 65 rounded inserted on centre line
Tissue tubes approx 0.2 long wound on 0.063 wire
5°%
C of G (175%)
Tissue binding to stop taper splitting
0.015 wire pigtail
0° down 2° left
Rear hook 0.013 wire



Warps

The original has 0.25" washout on the inside (port) wing of the turn before the motor is wound. The port side of the tailplane has 0.06 washin. In addition warps are tweaked to suit particular sites.

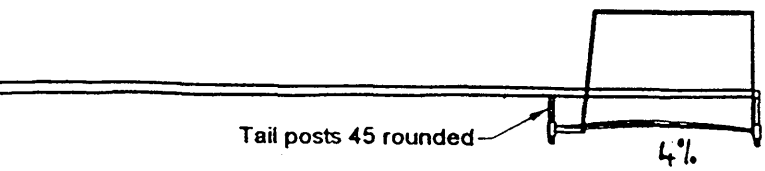
Motor Stick 4.8#. 11.4 long
170 x 110 > 230 x 110 > 195 x 110

Boom 5.5#. 11.25 long (including taper end)
130 x 85 > 70 x 60

Favourite Propeller
13 x 26 helical. Shape as a 15" Larrabee but with tips cut off

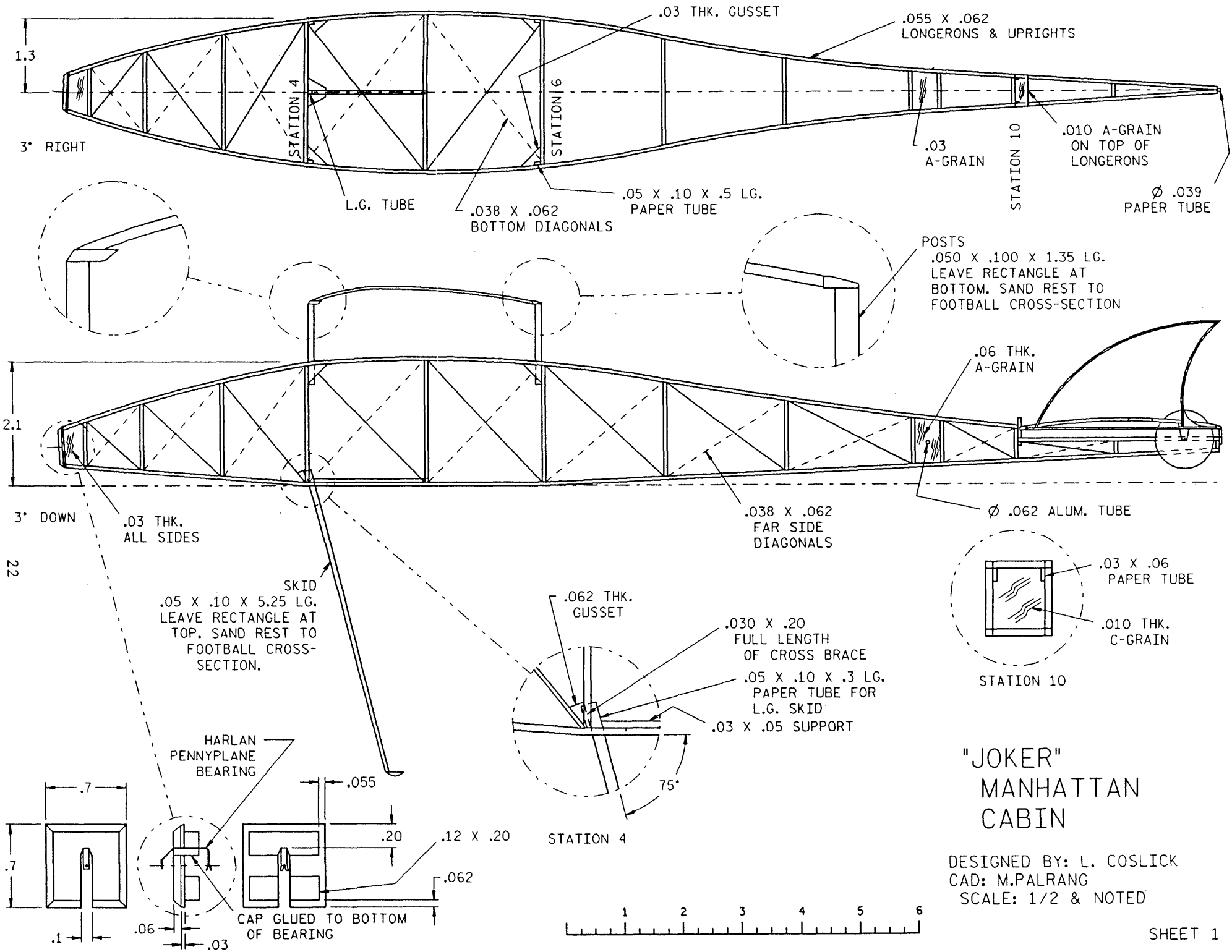
Motors and Times
1.1g 0.063 9:20 (26 feet)
1.1g 0.061 16:09 (1600 turns 26')
1.41 g/m half motor 12:50
(1300 turns, 0.35 in.oz, Cardington)

Unless Otherwise Stated
Scale half size
Dimension are in inches
Wood sizes in thousandths
# indicates lb/cu.in



FIL

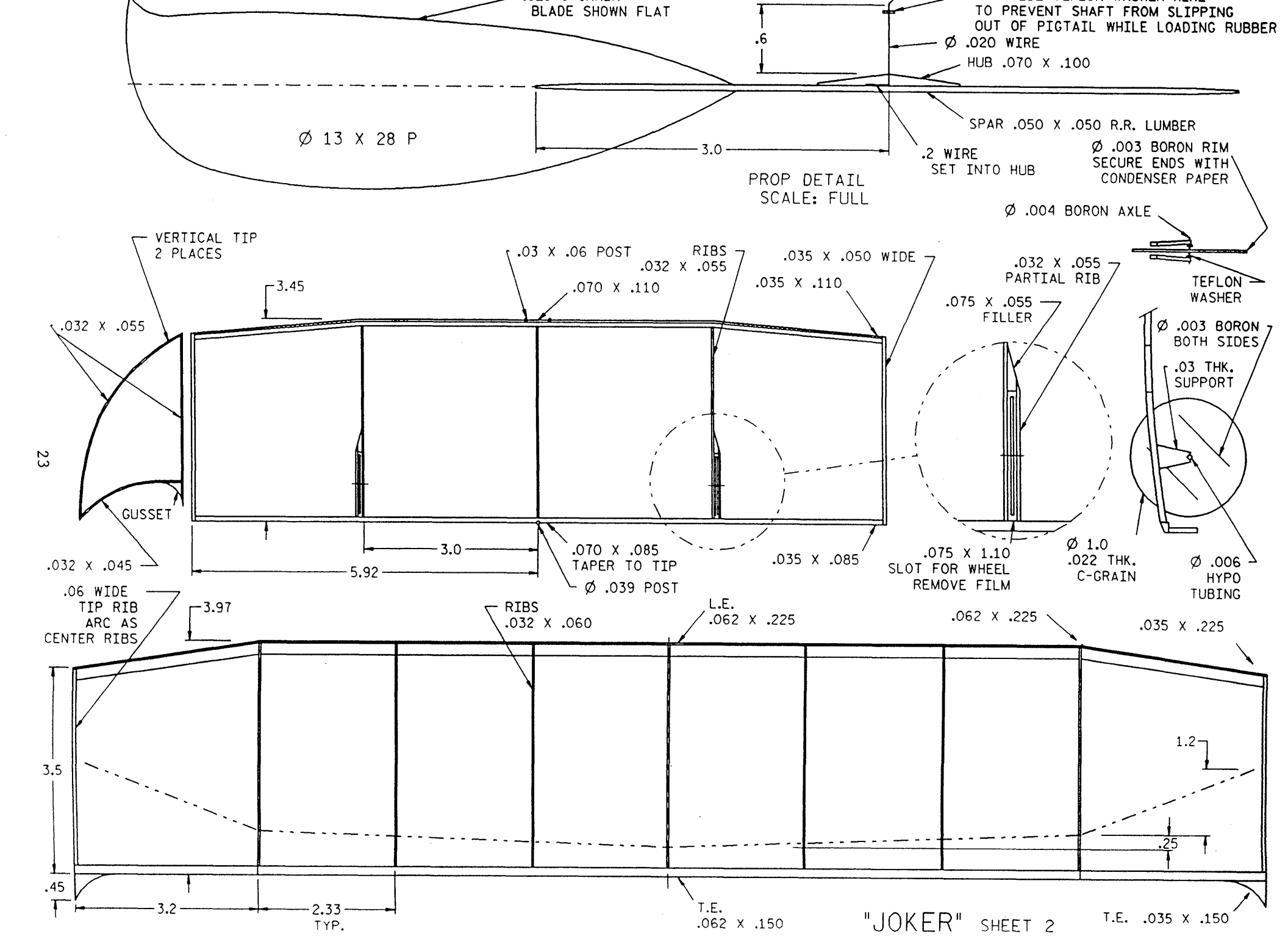
1998 EZB
by
Derek Richards



"JOKER"
MANHATTAN
CABIN

DESIGNED BY: L. COSLICK
CAD: M.PALRANG
SCALE: 1/2 & NOTED

SHEET 1


BLADE SHOWN FLAT
.6
Ø .020 WIRE
HUB .070 X .100
TO PREVENT SHAFT FROM SLIPPING
OUT OF PIGTAIL WHILE LOADING RUBBER
Ø 13 X 28 P
3.0
SPAR .050 X .050 R.R. LUMBER
.2 WIRE
SET INTO HUB
Ø .003 BORON RIM
SECURE ENDS WITH
CONDENSER PAPER
PROP DETAIL
SCALE: FULL
Ø .004 BORON AXLE
TEFLON
WASHER
VERTICAL TIP
2 PLACES
.03 X .06 POST
RIBS
.032 X .055
.035 X .050 WIDE
.070 X .110
.035 X .110
3.45
.032 X .055
.032 X .055
PARTIAL RIB
.075 X .055
FILLER
Ø .003 BORON
BOTH SIDES
.03 THK.
SUPPORT
GUSSET
.032 X .045
3.0
5.92
.070 X .085
TAPER TO TIP
Ø .039 POST
.035 X .085
.075 X 1.10
SLOT FOR WHEEL
REMOVE FILM
Ø 1.0
.022 THK.
C-GRAIN
Ø .006
HYPO
TUBING
.06 WIDE
TIP RIB
ARC AS
CENTER RIBS
3.97
RIBS
.032 X .060
L.E.
.062 X .225
.062 X .225
.035 X .225
3.5
1.2
.25
.45
3.2
2.33
TYP.
T.E.
.062 X .150
T.E. .035 X .150
"JOKER" SHEET 2

MODEL NAME "JOKER" Manhattan Cabin **BUILDER** L. Coslick

WING

Leading Edge Spar. Density 7.5# Grain. A Width .280" Height .062" **Trailing Edge** Spar. Density 7.5# Grain A Width .160" Height .062" **Leading Edge** Tips. .280X.062 at dihedral break, Tapered to .280X.032 at tip. **Trailing Edge** Tips. .160X.062" Tapered to .160X.032 at tip. **Ribs** Density 4.5# Grain C Size .028X.055 **Tip Ribs** .062 wide .032 High **Wing Posts** 7.5# .050X.120" 1.4" Long (4) **Wing Dry With 4 Posts** .740G **Wing Covered** With the older Ultrafilm .86G.Model was estimated to be underweight.

STAB

Leading Edge Spar. Density 7# Size. Tapered from center .070" high X .110" wide to .038"X.110 at tips **Trailing Edge** Spar Tapered from center rib .070" high X .085 wide to .038" X .085" at the tips. **Ribs.** Density 4.8# Size .032"X.055" **Wheels** 4# C Grain .022"X1" Diameter (2).**Axle** .004 Boron **Wheel Bearing** .006ID hypo. tubing, .1" long. **Wheel Stiffening** 3/4" .0003 Boron on each side of Wheel bearing, perpendicular to the grain of the wood, and around the diameter of each wheel. **Wheel Weight** .055G (2) **Tips**,Top. 5# .032X.045" End 5# .032X.045" Base .032X.055". Steam top and end pieces around a form. **Tips Dry** .04G (2) **Covered** .045G (2) **Stab Dry** with 3 mounting posts and wheel mounts. .215G. **Stab Covered** with Y2K Film. .234G

Skid

Size .050X.120" Tapered to .040X.085" 8#.Make first 1/2"of skid from 4.5# Balsa. Skid will break at joint and prevent damage to skid support during rough landing. **Skid** Length 5.3" **Skid Weight** .045G

Special Instructions for covering wing. Note that the front of the Leading Edge is tapered at a 60 degree angle. The ribs are mounted on top of the spar, up to that angle. To keep the film from sticking to the wing spar behind the the front of the ribs while applying the 77 spray, drafting tape is placed between each rib right up to the angle break.

MODEL NAME "JOKER" Manhattan Cabin **BUILDER** L. Coslick

FUSELAGE

Longerons. Density# 7.1# Grain A Width .055" Height .062". Cross-pieces. Density# see inst. Width .055" Height .062". Grain A. Detail landing gear and nose block on plan sheet if possible. Total weight of fuselage dry. 1.58G Weight covered. 1.9G. Type covering used. Microfilm _____ Plastic X.

Special Instructions. Cross pieces and uprights are 7.1# to T/E of wing and then 4.8# to rear of fuselage. Diagonals .062"X.032", 4.5#.Wing and Skid paper tubes are .050"X.120" ID. Stab paper tubes are 1/32"X.062"ID. All tubes are rectangular

Prop, Wood Blades

Blades, Density 4.5# Grain C Blade Thickness .025"

Prop, Spar Spruce, .050"X.050"X7" **Hub** .095"X.120"X1" Balsa **Prop, Shaft** .020" Prop Complete .055G Prop Pitch 30P Prop Diameter 13" Special Instructions on Prop and Nose Block. The prop shaft is inserted into the hub, bent over to 90 degree and cut to .3". Groove the hub so that the wire shaft is flush with the top of the hub. Glue the prop spar to the .095 face of hub. Attach the prop blades with carpenters glue. **Nose Block** The nose block is laminated from 1/32"and1/16"Medium balsa. If you use a Harlan bearing insert a small balsa wedge on the under side of the bearing for extra support. After the prop is threaded through the bearing, I glue a teflon washer behind the pig tail to prevent the prop shaft from slipping out of the pig tail when the motor is placed on the S hook.

MODEL NAME "JOKER" Manhattan Cabin **BUILDER** L. Coslick

RUBBER

Loop Length 22" Width .078" Rubber Vintage, Month and Year

8/93 _____ Weight of Loop. _____. Turns 2300

Back off Turns. 50 Launch Torque in inch ounces. .6 Turns Left 200

Do you use O rings. Yes. X No. _____

TRIM

Wash In, Wing Left panel _____ Wash Out Left panel. _____

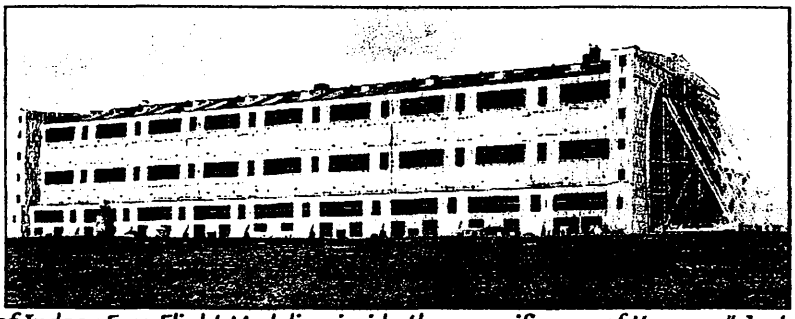
Wash Out, Right panel _____ Wash In, Right panel 1/8"

Wash In Stab, Yes X No _____ How Much 1/16"

Down Thrust. _____ Left Thrust. _____ Special trim instructions.

Model flies right. The rear mounted wheels and forward skid works best under full power. It has a tendency to tip over under low power,especially with a 30P prop.

East Coast Indoor Modelers 1999!



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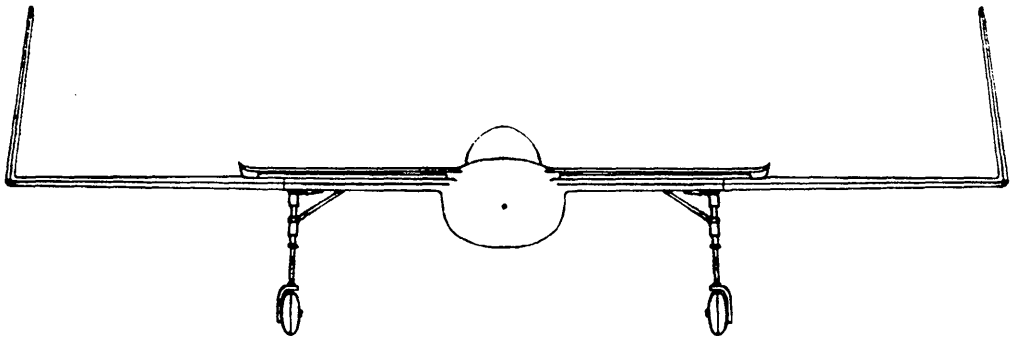
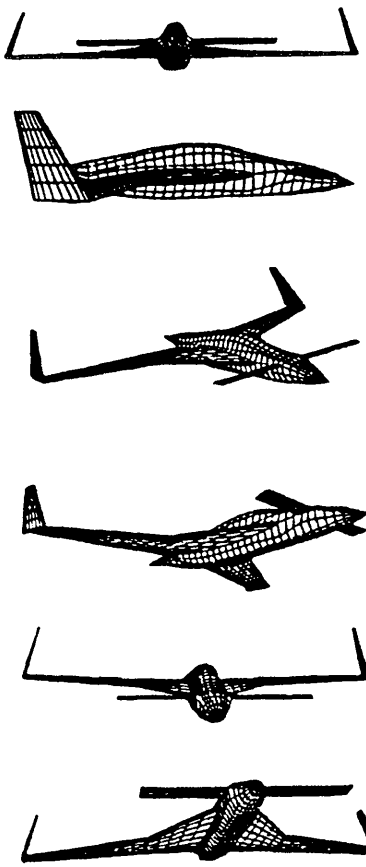
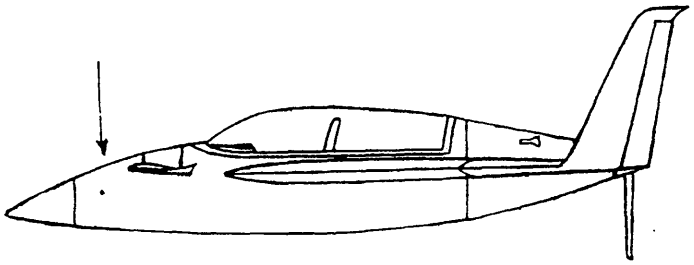
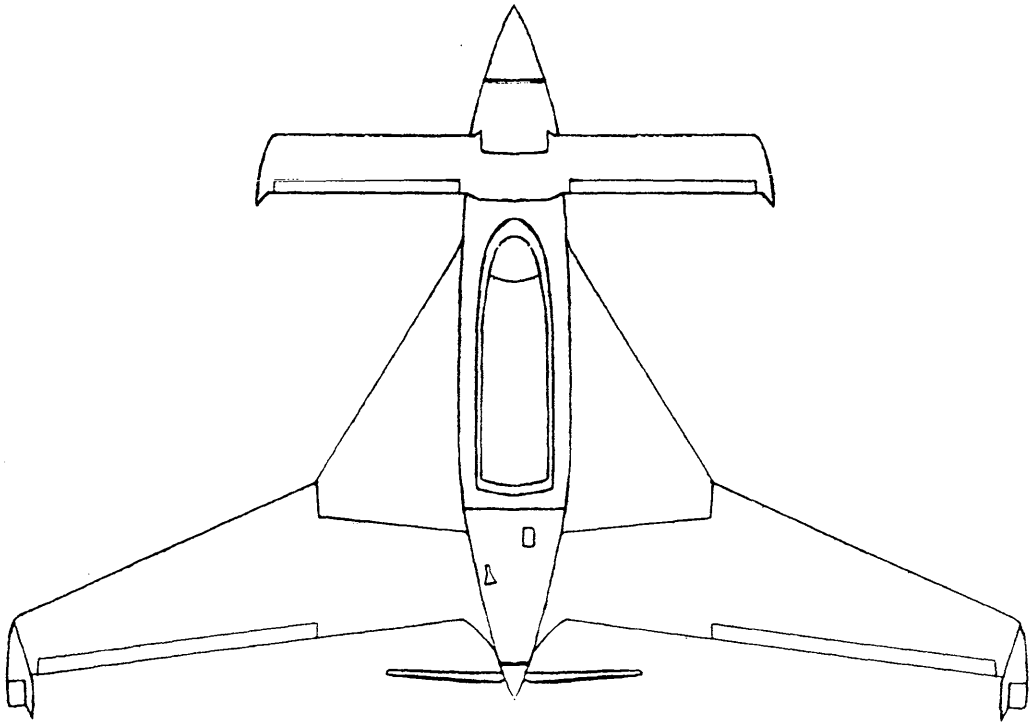
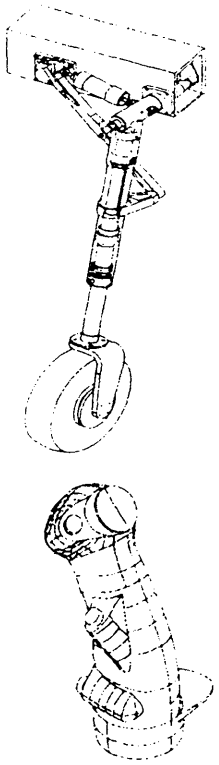




Front Motor Peg







Peanut Infinity 1 Foam construction

Bob Romash

I decided that for last year's USIC competition I wanted to make a new peanut scale. I wanted to utilize a modern, composite aircraft design. The only problem with these new aircraft, when modeling, is that they are very difficult to build using traditional methods, due to their smooth curving shapes. So I decided to use foam. This form of construction seems to be catching on and I have embraced it wholeheartedly. I picked one of the new canard kit aircraft called Infinity 1. It is very similar to Burt Rutan's series of canard aircraft. This particular canard is well suited for modeling due to its front and back seating arrangement. This makes for a slim fuselage and a bit less drag than some of the other side by side seated canards. The foams used in construction are readily available. For the fuselage I used something called "spyder" foam. This is a close cell foam similar to pink or blue insulation foam, but it comes in white. I believe it also sands to a finer finish. This foam is about 1.5 lb. density. It is easily shaped and formed.

The wings are made of foam trays available at your local supermarket. The canards are made from foam I found in a foam plate. This type of foam has a skin on both sides and is a bit stiffer and thusly more suitable for canards and rudders. Construction begins with enlarging the three-view to the appropriate size. For AMA peanut scale you can either have a 13-inch wing or a 9-inch fuselage with the wing being longer than 13 inches if it works out that way. This model is best suited for the 13-inch span application. First, you must make 2 rectangular foam pieces for the fuselage halves big enough so that you can trace the side view and top view of the fuse on them. The two pieces of foam should be held together by thin double sided tape, because after you have shaped the fuselage you will need to take the two halves apart to hollow out the inside. I usually cut out the side profile first and then the top profile. A band saw comes in handy here but a coping saw will suffice. This gives you a rough shape of the fuselage. The seam can either go down the middle or along the side. On this model I chose to have the seam on the side because the wing and canard will cover most of it up when they are attached later.

Once you have the rough fuselage shape, you must now rely on some sculpting skills to bring the rest of the shape out. I shaped my fuse with the canopy in place (which will later be cut off) just to make it easier to see the shape as I was sculpting. The first roughing out can be done with a sharp razor moving to sand paper afterward. I used 220 grit to start the shaping and worked down to 500 grit for final sanding. At this point I cut the canopy off, which will be replaced with a clear canopy. Care should be taken when cutting this off, and you should save it to use as a reference when making your canopy form buck. The buck should be made out of something harder than the foam itself. I used basswood for mine. A vacuum forming machine is not required for this canopy. Just some clear acetate and a heat gun will be sufficient. After heating up the acetate it can be pulled over the form by hand. This is what I did.

Back to the fuselage. Once you have the final shape carefully pull the two halves apart and this is where a Dremel tool comes in. I used a 3/8 inch round carbide cross cut tool bit to hog out the inside. This can be a tricky process. It's good to practice on some scrap foam before starting. Final thickness for the fuselage should be around .080. A good way to see thick spots is to hold up the fuse halves to the light. Thin spots will be lighter than thick spots. If you screw up and punch a hole in the foam with the tool you can cut out this area and insert a plug and start over on that spot. The only adhesives that should be used are two part epoxies (I prefer five-minute) or white glue (Elmers). There are foam compatible hot glues, but I don't have much experience with them. Feel free to try them out yourself. They may also have the advantage of being lighter. After the inside has been hollowed out attention must be paid to strengthening the area around the motor peg and the prop bearing. Gluing a small piece of wood or tiny tabs of light fiberglass on the inside for reinforcement can do this. Having the reinforcement on the inside makes for a better-looking model on the outside. Reinforcing the prop hub area is done by adding a piece of wood between the foam and the prop bearing itself. This wood is glued to the fuse.

The bearing is typical of any rubber type. I also added a spinner made of thin styrene sheet heat formed the same way as the canopy. Remember this is a pusher when making the prop. I made a 3-inch diameter propeller with a rather low pitch for my plane. Feel free to experiment. I put about 4 degrees of down thrust in the prop bearing. The wings are made by simply laying a cut out silhouette of the wing shape on the foam and cutting. Try to find a thicker foam meat tray for the wings. I started with a .250 piece. After the wings are cut out simply sand in an airfoil. I chose a very simple flat-bottomed airfoil. Shaping the wings is the same as the fuse only using sandpaper. Remember the root airfoil is significantly longer than the tip airfoil on this plane. Canards and wing tip rudders are made from the foam plates. This is usually

around .080 thickness. Also, simply sand in a basic airfoil here. Once the two wings and canards are shaped they must be attached to the fuse. Due to their long root cord, the wings can be tricky to attach. Remember that the fuse has a slight curve where the wing is being attached and the wing should parallel this curve at the root. You have to make sure that you attach both wings at exactly the same place and angle at either side of the fuse or you will have a schizophrenic flying aircraft. The same care must be taken when attaching the canards. My canards are mounted with slightly more incidence than is shown on the three view. I, also, incorporated movable control surfaces on the canard to facilitate trimming.

The canard works opposite of what a normal stab does. Bending control surfaces down will bring the nose up when flying. Bending the left control surface down more than the right will bring about a right turn and vice-versa. Most trimming will take place by adjusting the canard surfaces. The wing tip rudders are also made from the foam plates and incorporate movable surfaces as well. Making the surfaces move is easy by slicing part way through the foam at the hinge point allowing it to be bent. Care must be taken in mounting the rudder tiplets parallel to the centerline on the fuse. Detailing the model can be done a few different ways. Panel lines can be drawn on by using a fine pen. The only problem with this is that the lines are not very distinct due to the open cell nature of the foam (kind of like drawing on end grained balsa). I have decorated models using pens. But on my peanut I opted to use a slightly more time-consuming, but better-looking process of using black paint tape. This is available at automotive parts shops that have a good car refinishing section. Once I had the paint tape I sliced very thin pieces off (it has self-adhesive back) with a straight edge. These strips were about .010 wide and were placed on the model as the panel lines. Another advantage to using the paint tape is that if you mess up and put a line in the wrong spot it can be peeled off and repositioned.

For other types of models this foam can be airbrushed using acrylic paints. It is best to start off with a white foam when painting so that final colors can be applied to the white foam without using a bottom coat that may be required when using blue or pink foam, but no painting is required on this model. Cockpit detailing on my model included sealing off the hole in the fuse where the canopy goes with a thin piece of balsa and carving out the tops of instrument pods and pilot's heads out of foam. This adds a good deal of realism to the model and is lightweight. Landing gear is optional but will afford more scale points when the judges look at it. My landing gear was made to be removable for flight. This was done by inserting small styrene plastic tubes into the wings and fuse. The tops of the landing gear snug fit into these tubes. The three view doesn't show it but you should put typical landing gear door outlines on the bottom of the wings. The rear landing gear close toward the inside and the front gear closes toward the back. Info on exactly what the front gear looked like wasn't available so I just made it up.

Info on this plane was tricky to get in general because the first real prototype wasn't even flying when I made my model. I found this canard in Kitplanes magazine, which is a great source for info on the latest composite aircraft. Kitplanes mag can be found at any good magazine rack. Borders books and Barnes and Noble always have it as well as other aircraft mags. One problem that I have found with foam models is that they are discriminated against in competition judging and they are not at all legal for FAC peanut, but are only legal for AMA peanut. I lost points in section D (flying surfaces) of the scale judging sheet and section E (type covering). In section D three points are given if all surfaces are double covered and only one point if they are made from solid sheet, which is what I got! In section E I received zero points, because points are only given depending upon what type of covering is used. This is the biggest problem in the judging. This criterion was agreed upon before the proliferation of composite aircraft and widespread use of foam in model making. Hopefully in the future an amendment can be made in this section possibly for overall quality of finish. Realistically, using foam for these aircraft is much closer to the real thing than using stick and tissue construction. I have been experimenting with the use of very thin foam sheets .025 (available from Kenway, the electric motor guy) to make wing surfaces that are double covered, but are still foam. This is done by using an inner structure between sheets, usually just a spar then using the thin foam for top and bottom cover. I am still investigating this process and hope to have a peanut for this year using this construction method to try to get a few more points.

One drawback in using foam construction is that it seems to be a little heavier than stick and tissue. But, hopefully, weights will come down with more experience. My peanut weighed eight grams without landing gear. The best flight was a bit over a minute so far. The construction methods that I have talked

about here can be applied to just about any plane. WWII aircraft with their rounded, metal shapes are well suited for foam, as is just about anything else you can think of. I have, also, had a lot of fun making small gliders using foam. I just finished a 6 inch wing span balloon launch XB-70 Valkyrie using spyder foam for the fuse and Kenway's .025 sheet for the wing and canard and it looks pretty fantastic and flies well. I also made a modern composite sailplane complete with full cockpit detail. The cool thing is all these aircraft are white to start out with so you only have to add a few details to make em real bitchin.

Once you have a pile of foam in front of you just use your imagination and you can make some neat stuff. It doesn't have to be a peanut scale. You can maybe go pistachio scale or even coconut scale. It doesn't even have to be a plane. I made some cool little free-float sailboats out of the stuff for my local pond. I hope that this article will help to entice more models to be constructed this way. You will find, with a little practice, that these methods afford rapid construction so that you can spend more time detailing or building other models. Listed below are sources used and if anyone has a more detailed question feel free to call me, Rob Romash at (609) 985-6849 or drop me a line at 16-234 Somerset Ln. Marlton, NJ 08053 or email me at cognisync@aol.com.

Foam sources for free foam -- your local supermarket for meat tray foam. Ask the guys in the back cutting the meat for unused trays. It's great to see the look on their faces when you explain what you're up to-and the paper goods isle for foam plates.

Kenway Microflight – Mail address is PO Box 889 Hackettstown, NJ 07840. Phone (908) 850-0694. One and .5 millimeter white foam sheet 11 inches x 17 inch 10 pack is $18.50. This plane would also be well suited for Kenway's KR1D direct drive electric motor set.

Aerospace composite products—14210 Doolittle Dr.,San Leandro, Ca 94577 Order desk (800) 811-2009 Tech line (510) 352-2022 Fax (510) 352-2021 Web site at http://www.acp-composites.com Spyder foam as well as a multitude of composite materials

Infinity Aerospace – Mail address is PO Box 12275 El Cajon, CA 92022. Phone & Fax: (619) 448-5103. Email: Infaero@flash.net. Home Page: http://www.flash.net/~Infaero Info on Infinity 1 canard

Notice:
New Information on the
1999 International EZB Contest
at Johnson City TN

Due to a misunderstanding on which set of rules were to be used for this contest in 1999, both F1L (1.2 gram models, FAI style) and AMA (no weight limits) rules will be used in separate contests. These contests will run concurrently on Saturday from 5:30 to 10:00 PM. Processing will be from 5:30 to 6:00 followed by four one-hour rounds ending at 10:00 PM. Best two of four flights wins in both events.

Computer Color Your Model

By

Steve Gardner

Got a favorite airplane you have always wanted to model, but have never had the nerve to start because of its complex color scheme? Maybe an Albatross D-V with its pretty lozenge pattern and colorful personal markings. Maybe one of the super colorful modern aerobatics aircraft like the hot pink Sukhoi 31 or an Eagle bipe with its nine color feather motif. Scale modelers have long lists of models they want to build, but many are never started because of difficult color schemes or complicated lettering. Things like odd colors, light stripes on dark backgrounds, lettering, panel lines, and other details can make a simple model very hard to build. We have a new and powerful tool to help with these neglected models, the computer/ink jet printer combo.

Say you have a plane picked out that is lime green with maroon stripes and powder blue registration numbers on top of everything. The computer can solve all of your problems (except your horrible taste in colors!) with this paint scheme. Getting the maroon stripes onto the light green background without the layers of tissue making the maroon look black is practically impossible. Trying to get very light colors like powder blue to cover darker or contrasting colors is almost a lost cause. If you have an extra year you can always airbrush the model. This is still the most realistic way to finish a scale model, but I really like the watercolorish look of raw tissue and paint is very heavy. For a modern ink-jet style printer this color scheme is absolutely no problem. You can have any part of the tissue any color you like from white to black. The lime green will not have maroon layered over it and the powder blue letters will be the only pigment on the tissue where the letters are. The printer can give you tissue in any color or as many colors as you can imagine. With the right graphics program you can have lettering that will amaze you. You can put photos onto the tissue, or scan in the color three view of your model and simply print it into place. You are gona LOVE this!

You will need a computer and printer, although if you do not have these things you can rent them for a pretty low hourly rate at Kinkos or a similar place. A good graphics program is a must, but you can find one of these practically anywhere. There is the limit of how wide a piece of tissue you can print, but most modern printers will do what is called Banner printing that will allow you to print to almost any length.

I hope that this article will answer all of your questions about this neat new technique and that you will experiment with these new toys yourself. If you discover anything nifty please send it to us here at INAV, we are always after stuff like this.

Tissue

You can print onto any tissue at all from Gampi to heavy Silkspan, but there are differences from one to the next. My personal favorite is Japanese silk tissue bought from a paper specialty store

here in St Louis. It is cheap enough at 1.70 a sheet of 18X24 paper and it is very light at around 6 mg per square inch. The Esaka tissue available these days runs around 8-9 mg per square inch. After printing this tissue to a deep green the tissue weights around 6.4 mg per square inch, so weight is no problem. The Silk tissue is very soft compared to Esaka, and it has no shiny side. This tissue takes ink better than any other stuff I have tried. I have also printed Esaka tissue and even tested some domestic tissue. I can see no reason to ever have to deal with domestic tissue again since I can now have any color silk tissue I want. If you use a tissue with a shinny side, print on the dull side to prevent the ink from beading up on the tissue sizing. If you are going to pre shrink the tissue do so before printing and iron it out really well. If there are a lot of wrinkles in the tissue you will have trouble getting it onto the paper it rides through the printer on. I have not tried condenser tissue yet, but I can see it working well except for the base color being beige instead of white.

Printers and inks

I have used several brands of printer to print tissue and they all work very well. Some of the inks are better at resisting bleeding and some are more water resistant than others. There is even a brand of printer that uses a dry film based ink system that will allow metallic and opaque inks. After a fair bit of experimenting I have settled on the HP722C printer. Its main advantage is that it can vary the size of the drops of ink it uses to print. Say you want a nice light and delicate shade of pink on your tissue. If the printer uses a standard size dot of color (red in this case) to get a light shade it must use very few dots of its fixed size. This can make the color grainy. The HP 722c will use more dots of smaller size to get the same color. The beautiful gradation from one delicate pastel color to another with a jillion intermediary colors is really nice. Other printers can get very close, and some have better absolute resolution, but this is the one I like best. Its color ink cartridge also outlasts any color printer I have ever used by at least half.

While I am an obvious HP fan, this method will work with all ink jet style printers and I suspect all laser printers as well. You may have to experiment on the settings concerning quality of printing to prevent bleeding and to get good strong colors. Use the printer you have and do not worry about it.

The Method for Printing Tissue

Some of the first people to use these printers for tissue tried to simply tape the edges or corners of a sheet of tissue to a piece of paper and run this through the printer. Sometimes this will work great and I used the tape all the way around the edges method for a year or so before I figured out a better way. The major problem with this method is that the ink wets the tissue, which swells up and buckles into very fine wrinkles, which stick up and allow the passing print head to rub them. This can ruin a sheet of tissue pretty quick, and it is worse with darker, stronger colors due to greater amounts of ink.

This method is also kind of picky about the paper path through the printer. Printers with paths that bent the paper a great deal gave the tissue a good chance to jam the works since the tissue is loose on the paper. I did some experimenting and the very first way I tried turned out to be the winner. I start with a sheet of ink jet paper. It is a bit stiffer than bond paper and works best. I spray one side of this paper with a very light coat of 3M #77 Sprayment and then I stick it onto a clean scrape of cardboard and rub it down so that it is in good contact everywhere. I then immediately peel it up taking care not to crease it. The cardboard will take off the majority of the glue and the remaining tack is perfect for holding tissue. I have the tissue spread out on a flat surface and ready. I apply the paper to the tissue with a kind of rolling motion, to get it onto the tissue without wrinkles. I rub the paper down onto the tissue and then I trim the tissue to the edge of the paper. I now have a sheet of tissue ready to run through any kind of printer. Paper path is no longer important since the tissue is attached to the paper everywhere. Even if a gross over application of ink results in buckling, the glue will hold the tissue down and the print head will not touch and smear the color. I now make up several sheets of this to have on hand incase I want some colored tissue for a new project.

When you start printing tissue you may find that you have problems getting the colors strong enough, or the opposite problem, bleeding. To adjust his you will have to experiment with the print quality settings of the graphics program you are using. For the HP I recommend starting with the settings on "normal" or " economy" and the paper choice settings on "plain paper". If you are after very strong colors then the "normal" setting will apply a fair amount of ink to the tissue, and even pail colors will come out smoother on this setting. If there are very fine details or lettering on very high contrast backgrounds you might try the "economy" setting. The various printers may call these settings different names, but the idea is the same. A bit of experimentation and you will know what you need to do to get the effect you are after.

Once you have what you want on the tissue all that remains is to get the tissue off of the paper. You may consider leaving it on the paper until you are ready to cover since the paper makes flat storage easier. Once you are ready to cover the model all you need is some Naphtha (lighter fluid) to dissolve the #77 Sprayment glue. Turn the tissue face down on a very clean surface and dampen the paper with naphtha applied with a wadded up paper towel or cotton ball. All you need is to get the paper moist with the solvent and the tissue will come right off. If you were light enough in the glue application you are ready to go. The tissue will be solvent free in about a minute. If you used two or three times the needed amount of glue you will have to take it off of the tissue with the cotton ball. The naphtha will cut the glue like water through sugar. When the tissue is dry it will be just as it was before gluing, no residue at all. The solvent will not effect the ink in any way.

Graphics Programs

There are any number of good programs out there for putting together the different graphics you will want to use on your models. These programs fall into three basic categories: **Raster programs**, often called "paint" programs, which organize color by mapping the color of each pixel on the computer screen. **Vector Programs**, which use lines defined by direction and distance to make up shapes which are then color filled. **CAD programs**, Which are also vector based but which have easier dimensional control, but which are much less useful for color applications. There is a fair amount of overlap these days with the best programs, with the various methods adapting the best features of the others to make them better.

The best choice for our applications are the Vector programs like ***CorelDraw*** and ***Adobe Illustrator***. These programs are incredibly powerful design tools and have spectacular lettering and color capabilities. They can also use **Raster** art from the major paint programs that almost every computer has built into Windows. I use ***CorelDraw 5*** for my art and tissue printing and I can recommend it highly. The newest release of this program is #8, but it is expensive and the power it has is not needed anything but the very most complex professional uses. Any version from 3 on up will do the average modeler just fine.

If you intend to use photographs on your tissue then you will want a **Raster program** like ***Adobe Photoshop5*** or ***Paint Shop Pro 5***. If you have ***CorelDraw*** there is a program built into it called ***CorelPaint*** which is just fine. If you enjoy playing with computers these programs can be very entertaining. The special effects you can use on any given photo are almost infinite in number and appearance. Warning! This can soak up hours and hours.

Misc. Hardware

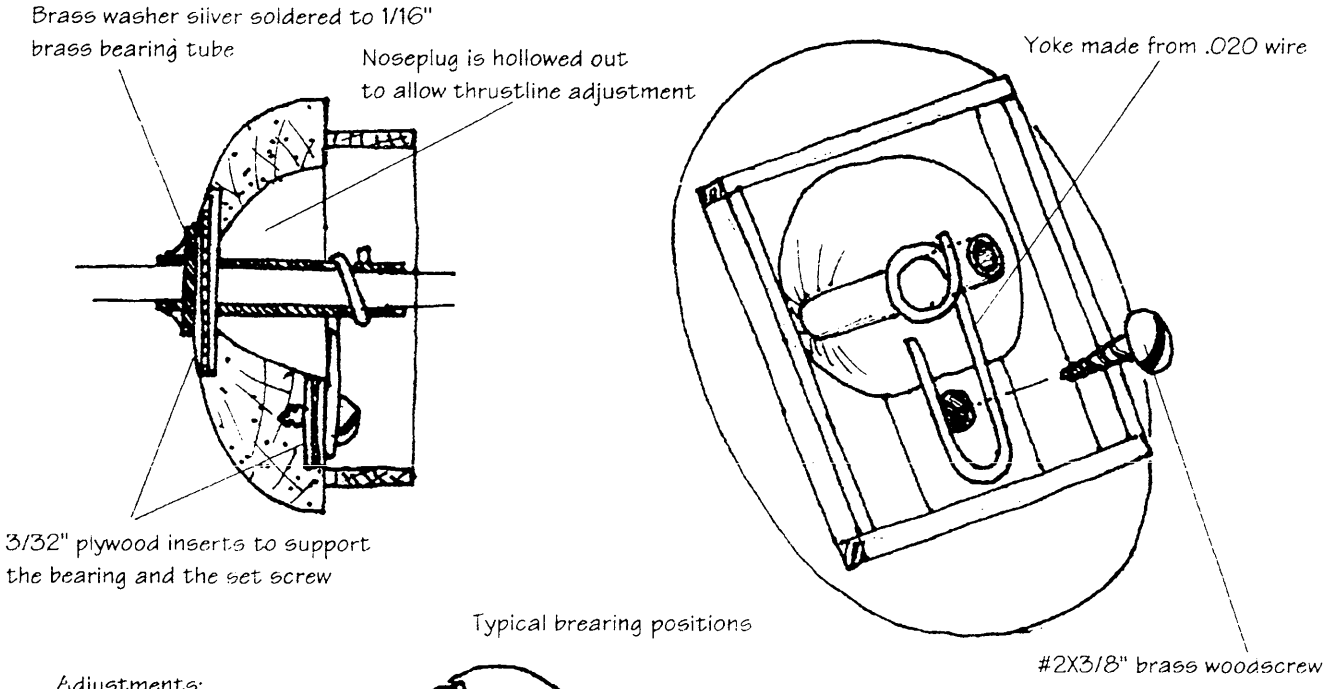
If you are after getting a specific marking or logo onto tissue, or if you want to print a color three view onto the tissue for a scale model, you will want a color flatbed scanner. These things are very cheap these days and the poorest ones perform better than the pro models of five years ago. You will want at least 300 dot per inch resolution (optical) and 24 bit color (16 million colors). You will have trouble finding a scanner for sale these days with specs this poor, so do not worry about it too much. One item that is becoming very popular that you will not need is a digital camera. A 70-dollar scanner and a cheap or even disposable 35-mm film camera will make much better pictures for the net or tissue printing than will a digital camera.

Using the tissue

Even though the ink is not waterproof, I use thinned yellow glue (titebond) to attach the tissue. Since the ink is resistant to the water to a moderate extent this works fine with no smearing at all. The new glue sticks will also do a very good job without any water-related problems. The ink is dope proof so you can also use the traditional methods of attaching tissue with dope. The real difference between this tissue and regular tissue is the way you shrink it. To get this tissue to shrink without ruining the colors you have to get it wet without having fluid water on it. Rubbing alcohol with the usual

25% water sprayed from a Final Net bottle (hairspray) can be used with good effect. To get just the finest mist onto the model without heavy droplets, you spray the alcohol into the air in front of you and then pass the tissue cover whatever through the cloud of mist. You can do this several times at one go, just be sure not to get the surface actually wet. It is easy to underestimate the shrinking power of this method and get warps. Go slow and if you need to you can repeat the spraying. Once you have the tissue shrunk to your satisfaction you can add a coat of very well pastisized dope if you so desire. If the model will be flown strictly indoors you can skip this step. The ink is not so easily disturbed by handling as to need dope just for holding the color down.

A very nice feature of using this method of coloring tissue is that if you damage the model or tear the tissue by blowing a motor you can just print up a perfect matching patch. Even if the damaged area is full of very fine details and multiple colors the patch will match perfectly.



Adjustable thrustline noseplug
by Steve Gardner
3/10/99

Indoor News and Views
Plan, Article, and Contest Result Index
1994-1999

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New Rules for FID

Affective January 1, 2001, the rules for FID will read. 55CM minimum wing span, 1.2 gram minimum model weight, and .5 gram maximum rubber weight. We at INAV felt that the 55CM and the 1.2 gram rules proposal had a good chance of passing, but were shocked to hear that the rubber restriction passed. Also, there are no restrictions on model design. With the .5 gram rubber rule, the aerodynamics of the new models will have to be as clean as possible. Multi-flying surfaces probably won't be of any advantage.

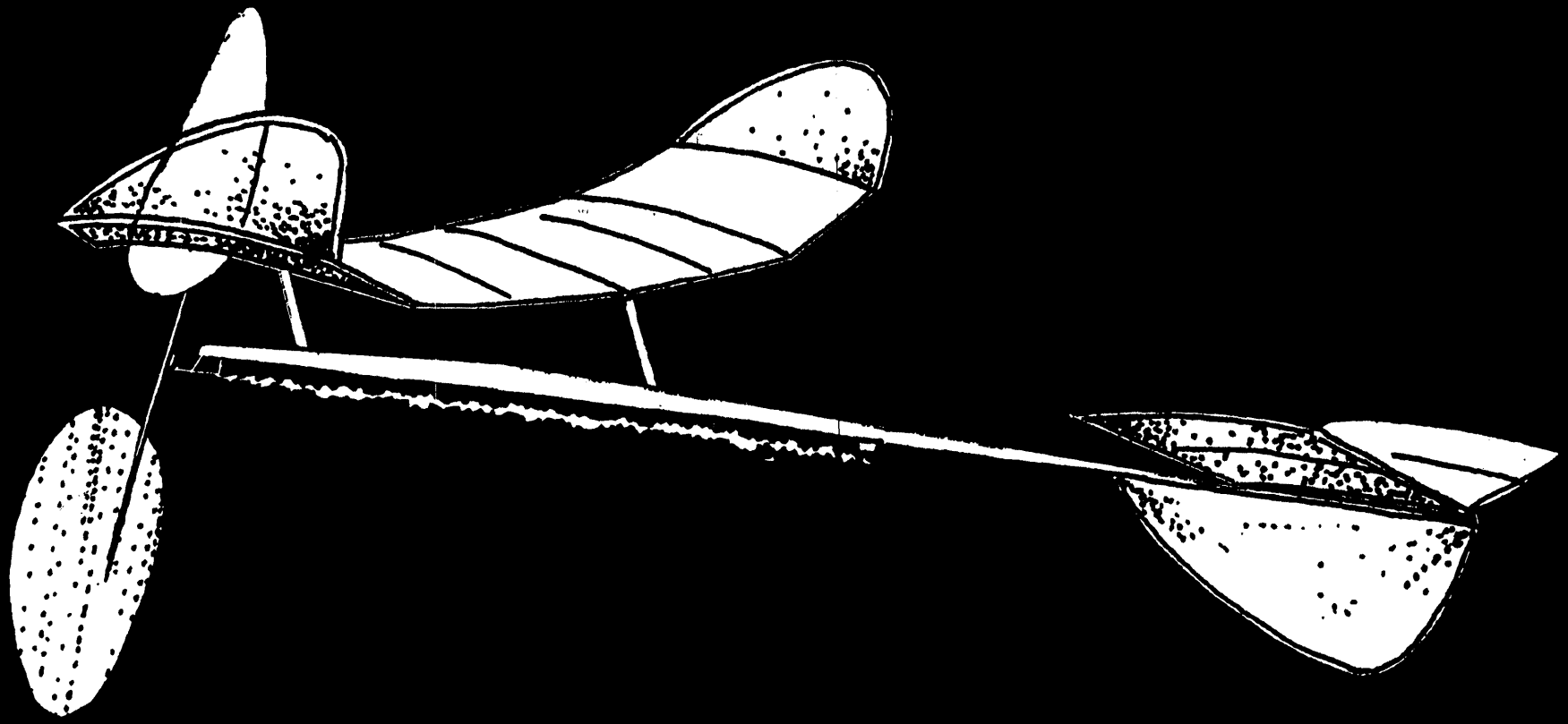
It will be interesting to see how many of the current FID fliers will switch over to the new set of rules. We would be interested in your design for the new FID rules. Please send good computer generated drawings to INAV, and we will use them in future issues.

Issue #97

Indoor News and Views

July, 1999

USIC 99



Johnson City, TN

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INAV DUES ARE

U.S.	$: 9.00/year
Canada	$12.00/year
Other (air mail)	$15.00/year

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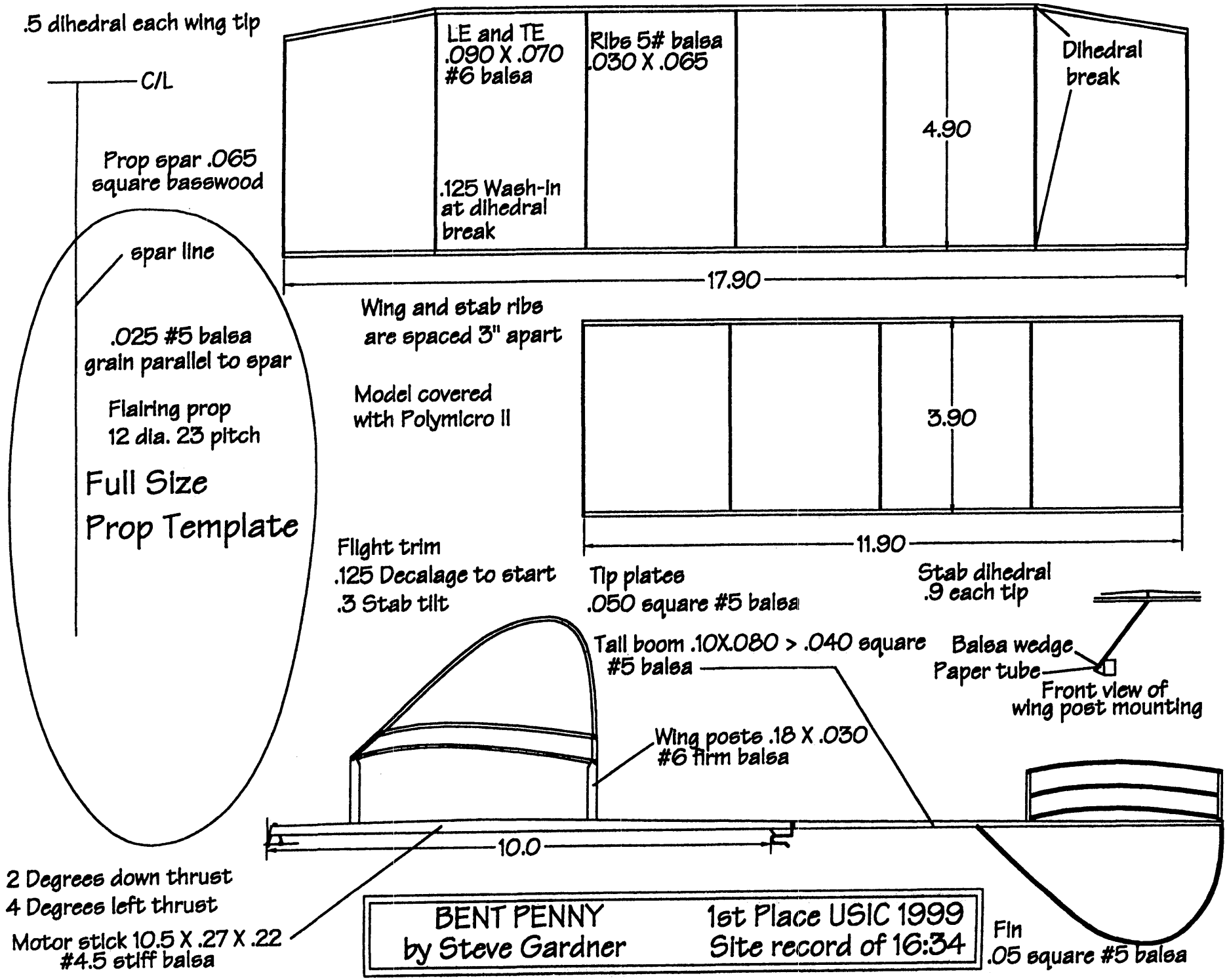
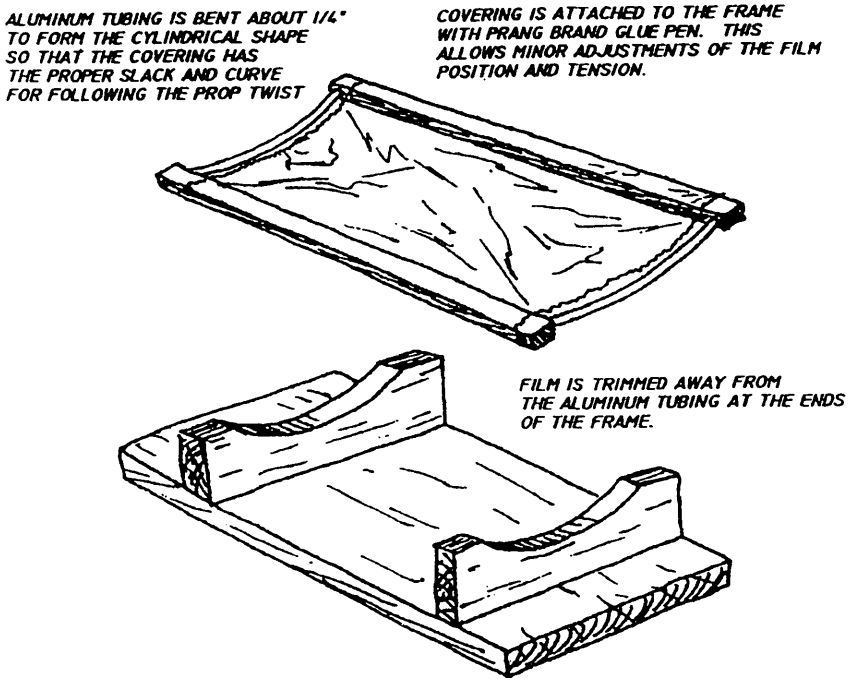

.5 dihedral each wing tip
C/L
Prop spar .065
square basswood
spar line
.025 #5 balsa
grain parallel to spar
Flairing prop
12 dia. 23 pitch
Full Size
Prop Template
LE and TE
.090 X .070
#6 balsa
Ribs 5# balsa
.030 X .065
.125 Wash-in
at dihedral
break
4.90
Dihedral
break
17.90
Wing and stab ribs
are spaced 3" apart
Model covered
with Polymicro II
3.90
11.90
Flight trim
.125 Decalage to start
.3 Stab tilt
Tip plates
.050 square #5 balsa
Stab dihedral
.9 each tip
Tail boom .10X.080 > .040 square
#5 balsa
Balsa wedge
Paper tube
Front view of
wing post mounting
Wing posts .18 X .030
#6 firm balsa
10.0
2 Degrees down thrust
4 Degrees left thrust
Motor stick 10.5 X .27 X .22
#4.5 stiff balsa
BENT PENNY
by Steve Gardner
1st Place USIC 1999
Site record of 16:34
Fin
.05 square #5 balsa

A neat easy way to cover built-up Propellers with plastic or microfilm

By Larry Coslick and Steve Gardner

The following method is based on the one developed by Larry Coslick and myself for covering props with the new Y2K film. It is applicable to any other covering material including microfilm and any sized prop. It has the double advantage of being very easy and working really well.

First build the basic jig base for the size props you are going to cover. Larger jigs may be used for smaller props with a bit of care, but of course smaller jigs are no good for the larger props, so unless you build a bunch of those little ROGs start with a large jig. See the drawings.



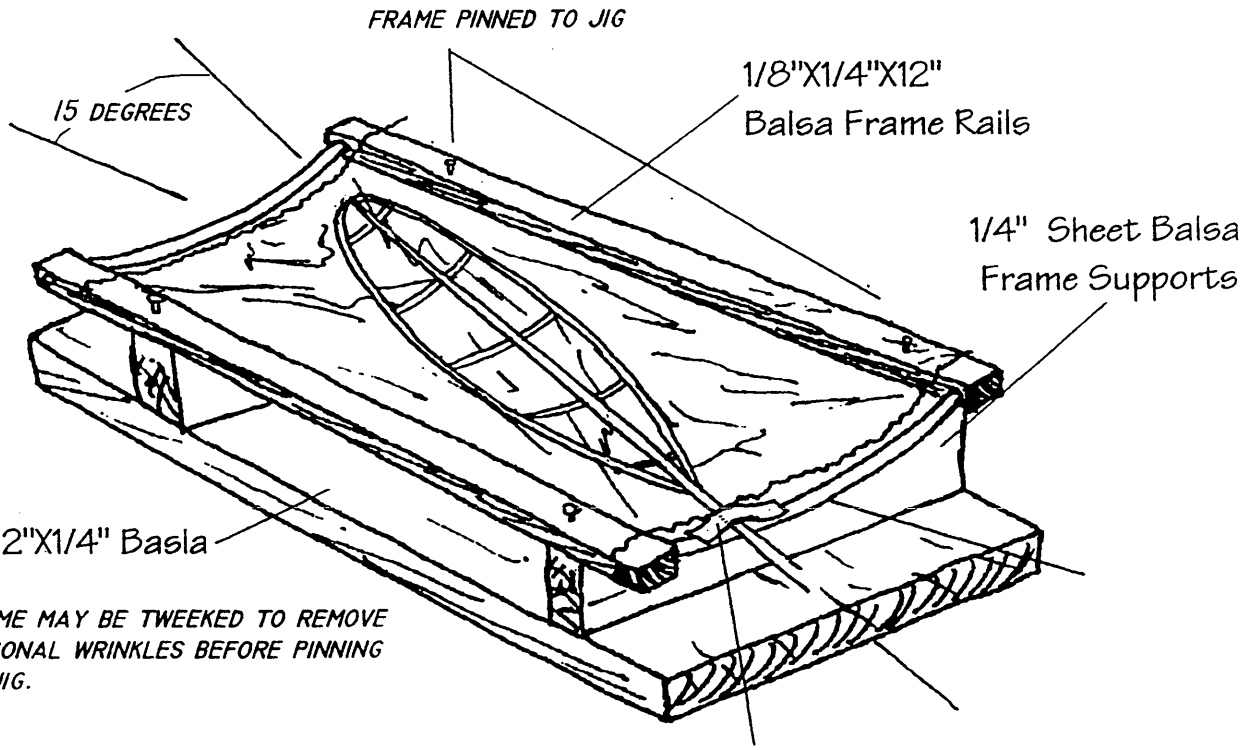
Next, build a pair of covering frames. These are made from 1/8 X 1/4 firm balsa strips of the appropriate length joined by 1/16 dia aluminum tubing at each end. The ends of the aluminum tubes are flattened and glued into holes drilled into the balsa strips. This aluminum tubing allows the frames to be bent to shape after the covering material is applied.

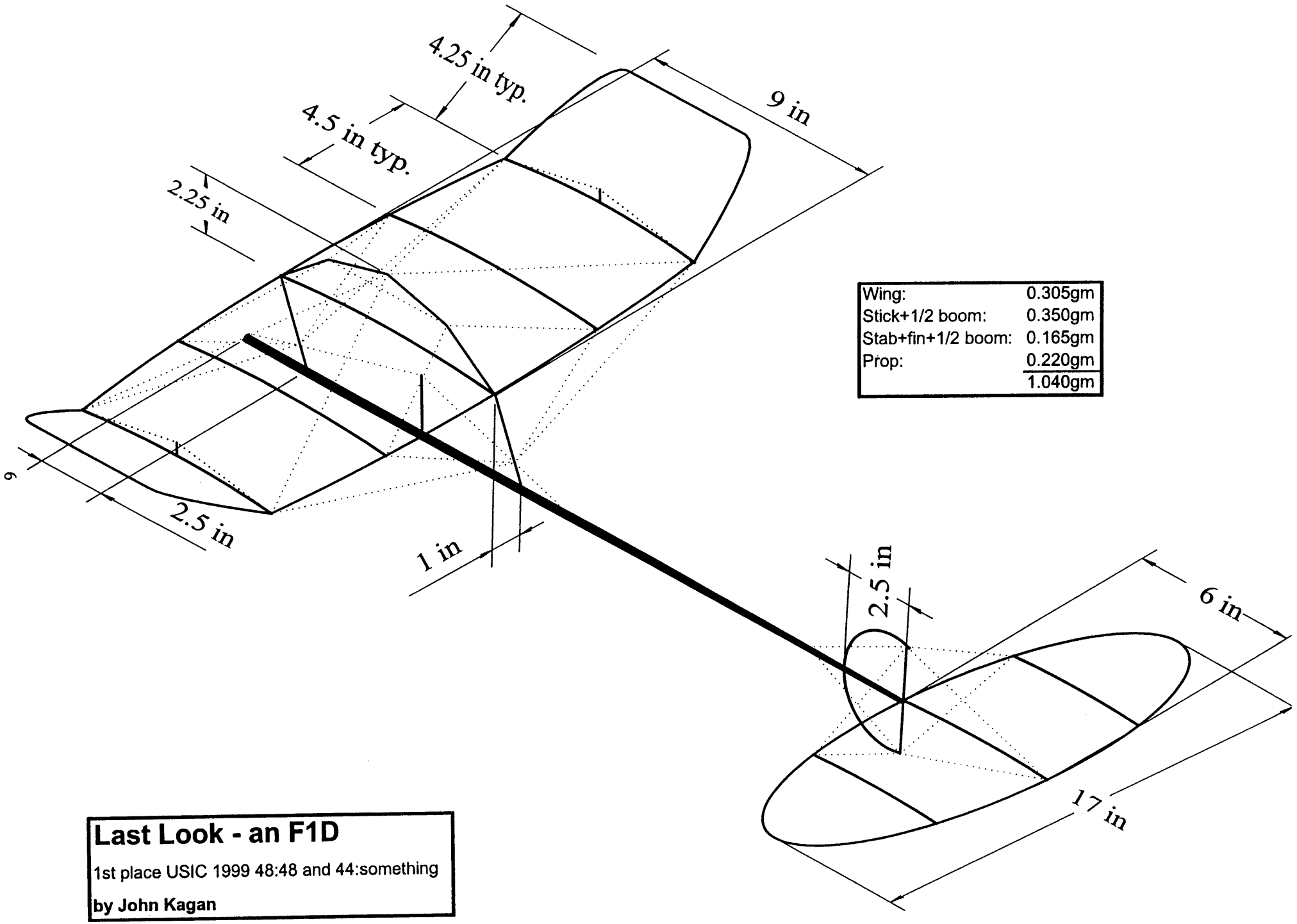
Once the two frames are built and are covered with film the tubes are bent into arcs so as to allow the covering material to take the shape of a section of a cylinder. The covering material is then cut free from the tubing with a hot soldering iron. For microfilm a small length of thread is glued to the tip of the propeller and to the aluminum tube nearest the prop tip. This thread prevents the film from tearing when most of the film has been trimmed around the prop outline.

Before you can spray the prop with the 77 Sprayment glue you must take a length of masking tape 1/8 wide and cover the prop spar so that the covering material will not adhere to it. Drafting tape or other very low tack tape is good here to prevent trouble getting this tape off of the prop without damaging it. Once the prop has the glue sprayed onto it remove the tape and it is ready to place on the film. Have a 1" bit of the same low tack tape ready before you proceed.

Position the prop at the classic 15-degree angle so that the twist of the blade matches the curve of the covering on the frame. The prop is placed by putting the hub at the hook onto the tubing and rocking the prop down onto the film. Carefully position the prop so that the leading and trailing edges meet the film at the same time. Once the prop is in contact with the film take the bit of tape mentioned before and tape the hub to the tubing of the frame. Now the prop and film are held at one end by the tape and the other by the length of thread (for microfilm only). Gently push the prop outline down onto the covering, or reach underneath the frame and lift the covering up to the outline as needed to get the outline attached to the film everywhere.

Once the outline is attached to the film everywhere you can trim the film around the prop. The thread will prevent the prop moving and tearing the microfilm once most of the outline is cut free, and in the case of plastic film, leave the very tip of the prop until last when trimming. Remember to remove the tape at the hub before trying to lift the prop from the frame.





Wing:	0.305gm
Stick+1/2 boom:	0.350gm
Stab+fin+1/2 boom:	0.165gm
Prop:	0.220gm
	1.040gm

Last Look - an F1D

1st place USIC 1999 48:48 and 44:something

by John Kagan

Last Look - Material Dimesions

6/1999 John Kagan

Component	Size	Density	Notes
Motor stick			
Tube	.0125 x .212id x 14.5"	4.6# C	.004 boron at 0, 90, 180, 270
Rear web	.020 x 1/2" x 3/8"	5# C	Web extends above tube
Rear hook	.013 music wire		
Front web	.020 x 1/2" x tube dia.	5# C	
Prop hanger	Harlan		
Front and rear "floor"	.0125 x 1/8" x 3/4"	4.6" C	Glue on outside of tube
Bracing post	.048 sq. -> .040 sq. x 2"	6-7#	Slit to fit over boron
Wing tubes	Tissue .060id x 3/8"		~3-4 wraps
Bracing	.001 tungsten		
Boom			
Tube	.008 x .255" x .135" x 13"	4# C	
Rear cap	.008	4# C	
Joiner tube	.008 x 1/2"	4# C	Cut boom at 6.5"
Wing			
Spar	.034 x .042	5.1# A or B	Planform is 4"x 26.5" ellipse split in half and placed around a 5" x 26.5" rectangle.
Tip	.032 x .036	5# A	
Cabane	.033 x .035 x 2-5/8" (4)	4.5# A	Barn roof shape w/ tungsten bracing
Posts	.034 x .055 x 4"	5# A or B	(2) .003 boron each on sides
Compression ribs			
Rib	.024 x .064	5# C	3% arc
Bracing post	.024 sq. x .5"		Top of rib at halfway point
Wire	.0003 Tungsten		
Middle ribs	.024 x .048	5# C	3% arc
Bracing wire	.0007 nichrome		
Stab			
Outline	.027 x .040	5# A	No taper
Center rib	.024 x .045	5# C	3% arc
Outer ribs	.024 x .038	5# C	3% arc
Fin			
Outline	.024 sq.	4.5# A	
Post	.028 x .050 -> .040	5# A or B	Taper from center to tips
Prop (see Steve Brown's excellent article in previous issue)			
Outline	.024 sq.	5# A	
Ribs	.025 sq.	5# C	6% arc
Center spar yoke	.075 x 1.25 x .1 -> .045	4.5# A	Taper toward tips
Spar	.075 x .080 -> .025 sq. x 10.5		
Shaft	.013 music wire		Loop around yoke
Yoke	.011 music wire		
Screw arm	.033 x .095	Basswood	
Spring	.009 music wire		8 turns
Motor			
Size	.069 x 17"		
Batch	10/97		

CAT IV EZB Record – Larry Cailliau

After the NATS in 1998 I decided to build two new EZB's since my old models were about 3 years old, and not keeping up with the pace set by Larry Coslick. So before I get started I wanted everyone to know that much of my success with EZB is due to the help and research from Larry Coslick, he is the true EZB pioneer. I decided to build during the rainy season that winter, and spent the rest of the summer pondering on how to built a better prop. The old props were set with about ¾ of the blade area in front of a long skinny spar and used mostly spar deflection to flair the prop. This would work fine for higher sites and the lower humidity in Sana Ana. (About 45-50%). I determined that with the higher humidity in Johnson City (Above 50%), these prop spars would take a set in flight and not return to the original lower settings and the model would land with too many turns. I felt that the prop would work better with a slightly smaller diameter and a slightly ticker spar, and about 9/10 of the blade area in front of the spar. With this set up I hoped to get flair more torsionally around the spar and may be it would return better in high humidity. I think it does. I also had a problem with blade grain direction, but couldn't quite figure it out.

Before building I asked Larry Coslick to show me his latest EZBs, which he graciously did, and wouldn't you know he had a prop with the grain 90 degrees to the spar. I didn't think this would work because the outline would waffle too much, but his was perfectly straight. I was enthused and after studying his models went home to build, trying to copy what I saw. The overall dimensions are identical to his hobby shopper. Only difference is wing tip shape and prop shape. Both models were from the same wood and as identical as I could make them. They were set up the same as the old EZB. One flew perfect right out of the box (never ever changed wing incidence – a first) the other took half motor testing and tweeking all day long. Go figure! They both came out to 1/2 gram and used Y2K film for physiological support because not much weight is saved on EZB covering, besides the colors look nicer. The new props came out lighter because the blades could be made thinner with the 90 degree grain.

The second test session at Sana Ana was to be the models 1st full motor flights trying to keep altitude below 100' for Johnson City. My 1st flight calculation from ½ motors were way off, it climbed to 130' with a time of 32 minutes. The motor was 031" x 12.5", 2400 turns. Czar Banks and Steve Brown casually observed the flight saying its flying great and should go for the record. I said no that I had to save the models for USIC, NATS. My friend Bob DeBatty came to me and whispered he would rather have the record than save it for Johnson City. I thought for a minute, there was not much drift that day, and said O.K. I was not gung-ho about this because I had come to test for USIC and had no intentions or thoughts about records. Anyway, the 2nd flight, or 1st record attempt, was wound a little more and it leveled off about 135', stayed centered and landed at 33:30, just short of the record. The 2nd attempt using the same motor was wound tight, 2600 turns, 40 back off turns to a torque of .13. The model grooved and climbed to 140' and was nicely centered. It came down for a nice safe, no-touch, no-steer flight of 35:34. That's the story, some days everything falls into place, others I should have stayed in bed.

New Rules F1d

By Steve Brown

The recent F1d rules change has caused a lot of controversy among U.S. flyers. Effective in 2001, maximum wingspan is reduced from 65cm to 55cm, minimum weight is raised from 1.0gm to 1.2gm and a maximum motor weight is imposed at 0.5gm. The CIAM Free Flight Subcommittee is composed mostly of outdoor flyers and voted 14-5 in favor of the agenda proposed by Hungary. Apparently the Subcommittee referenced the perceived success of performance restrictions in F1b and F1c and applied this philosophy to indoor models. U.S. input was not incorporated in the final specification.

Rules change proponents cited the steady decrease in F1d participation worldwide and the desirability of decreased performance as a means of making the event more accessible to flyers coming to F1d from other classes. A smaller, more robust model was another goal, to improve transportability and to make F1d more suitable for competitions in smaller, low-ceiling sites. I found the "need" to reduce performance puzzling and I know of no U.S. flyers voicing such a need.

Upon hearing of the rules change I began building prototypes to assess the impact of the changes. Larry Coslick asked me to share my experiences with INAV readers. I want to express a caveat about the thoughts that follow and the model design in the plan: my experience with this class evolves with each flying session. This design may or may not prove to be the correct one and is very much a work in progress.

The new rules raise many issues. For example, it can be assumed that the flyer will always want to carry the maximum allowable amount of rubber, 0.5gm. Any change to motor length then requires a corresponding change to motor width. While wingspan has been reduced and the need for long motorsticks has been eliminated, the weight limit has been increased by 0.2gm. Where is one to put the additional weight? Up to 0.13gm of ballast was required on all three of the prototypes I built. Every change made to the model, such as substituting a VP prop for a fixed pitch prop, requires reballasting. It may have been assumed that the extra weight would automatically be used for plastic covering instead of microfilm. Unfortunately for that assumption, a poll taken at the 1998 World Champs in Romania demonstrated that support currently does not exist for the elimination of microfilm.
Reflecting the spirit of the new rules I built each of the prototypes in a very sturdy manner, using wood sizes and densities that would have resulted in a 65cm model being grossly overweight. No special effort was made to save weight in the traditional ways, i.e., glue weight reduction, minimum wood sizes and densities. I found that the "challenge" was to find ways to make the model components heavier. Size-wise, this model could easily be built to less than 1.0gm and have adequate strength. The prototypes reflect my usual design preferences, that is, large chord wings, long fuselages and moderately large diameter, slow turning props.

With the rubber weight restriction it is essential to try to use every available turn. This implies launching the model with little or no backoff. Upon flying the prototypes several things immediately became clear. Large diameter props (19-20") and high torque (around 0.5 in./oz. for the rubber used) with little backoff caused unacceptable launch stability problems. The model would typically emulate a Mini-Stick and torque roll to the left to the point where side thrust became down thrust. The airplane would then race around in a tight circle until the torque diminished. Once a modest torque level was reached the model would slowly climb to about half the desired height. Various combinations of prop diameter (18 – 20" fixed and VP), wing offset (1", 1.25", 1.5"), wing wash (up to 0.3") and wingpost height (3.5 – 5") and wing chord (9", 9.5", 10") were tried.

Since it appeared that motor length would be in the 7.5 – 8.5" range it was logical to reduce the motorstick length to 8.5 – 9". I found that 9" motorsticks rolled on the usual 0.25" diameter forms were so resistant to twisting that little wingpost deflection could be observed at maximum torque. This implies that, unlike 65cm F1d, no extra wing wash was being twisted into the wing under high power. It appears that a smaller stick diameter is needed so that a modest amount of additional wing wash is twisted in at launch. It may be that when stick diameter is optimized the amount of wing offset can be reduced to the usual 1".

I eventually found a combination of configuration, power and adjustments that allowed my prototype to consistently turn times in the 29 minute range. The best time was 29:20 using a 20"/33" fixed pitch prop with moderate blade area. I found it necessary to reduce launch torque to 0.3 in./oz. This required a backoff of about 40 turns in a 7.75" loop of .048" X .041" July 1997 Tan II. This produced a flight using all of 1160 launch turns and a maximum height of about 130 feet. Average prop RPM was 39.5.

We should ask ourselves whether the performance of the prototype reflects the intent of the rules. In terms of reduced performance I think it clearly meets the intent. I am told that the European proponents used 26 minutes as a target. Whether you or I perceive a "need" to reduce performance is another question. Personally, I have never felt a need to reduce performance in any site. With unrestricted rubber this prototype could do 45 minutes. It's sobering to reflect upon the fact that F1d's will now fly lower times than EZB.

I did not attempt to construct my prototype with a detachable tailboom to improve transportability. That is an obvious use for some of the extra weight. The larger wood sizes produce a much more robust model, even when covered with blue microfilm. With the wood sizes I used the wing is very strong and can be steered easily. Ground handling is improved compared to 65cm F1d. The motorstick is easier to build and more resistant to damage.

One area that does not meet the intent of the rules is model size. The prototype is basically the same size as 65cm F1d's, reflecting the high minimum weight. Short of building a Pennyplane-like model of hobby shop balsa covered with plastic there is nowhere to put the weight except in size or gadgets. Biplanes, anyone?

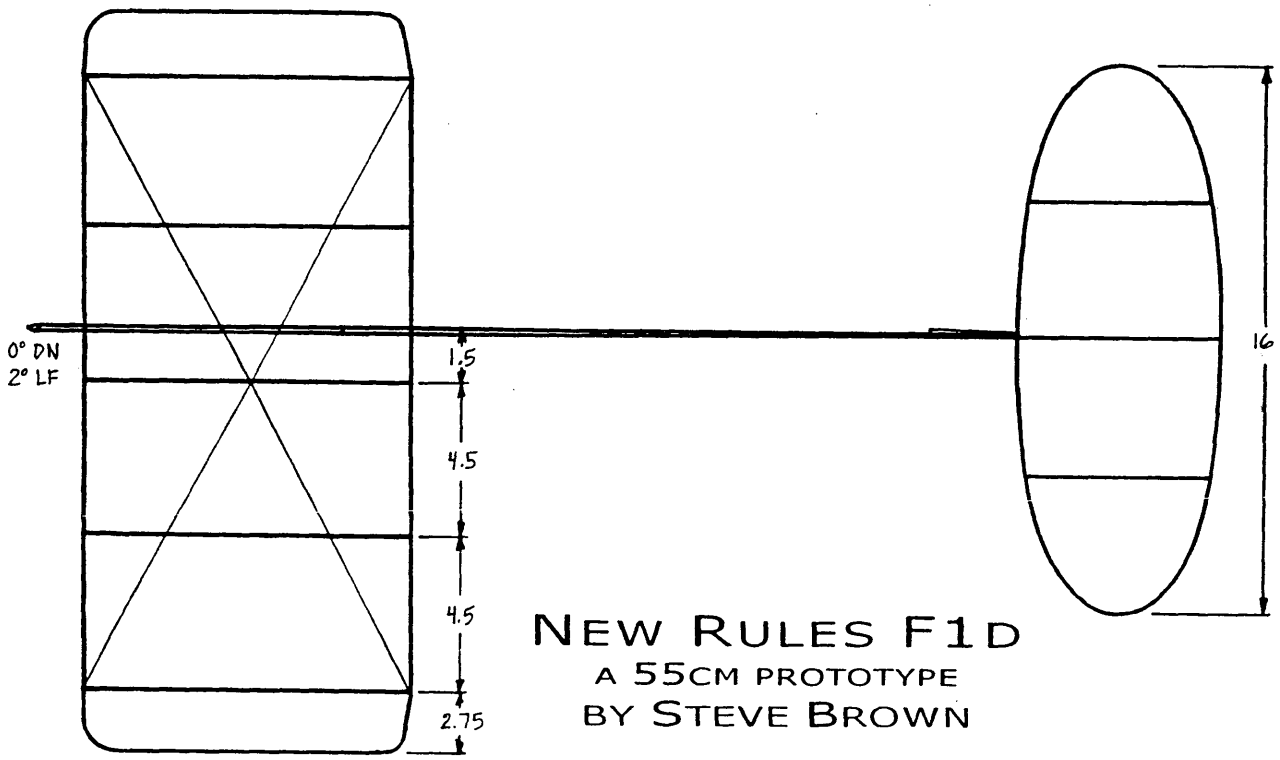
In my opinion the new rules were intended to promote a small wing chord/small prop paradigm. But the 1.2gm weight undercuts that intent. The best way to influence model design toward smaller airplanes would have been to reduce the minimum weight, perhaps to 0.75gm. The prototype may be criticized for its wide wing chord. It has been suggested that an unbraced, narrow chord model that is "more efficient" due to reduced drag will be equal or superior to a wide chord design. I can only defer to experience, which is that the primary determinant of indoor duration is wing loading. If a minimum weight of 1.2gm is mandated the wing loading of a 9" chord model will be much lower than the wing loading of a 6" chord model. History implies that the lower wing loading will prevail. The performance potential of narrow chord airplanes has been touted for many years, but wide chord designs have been the winners.

Another stated goal was to produce a model that was more suited to flying in smaller sites and to construction by less skilled flyers. I took this to mean an airplane that was smaller, more robust in construction, turning in smaller circles and flying faster for better penetration. I found that with a fixed pitch prop the prototype flies about the same speed as a 65cm F1d. With a VP prop it flies a little slower. Due, I think, to the low torque of the small cross-section motor, in the last half of the flight there is less ability to penetrate moving or turbulent air. This model may drift more than 65cm airplanes. The models are easier to construct, but they are not easier to adjust or fly. Obtaining optimum performance from the restricted motors will require significant amounts of skill and patience. The process of repeatably making motors of the correct weight is difficult and the need to constantly reballast the model is a nuisance.

Will the new rules increase participation? In my opinion it is flying site availability and competition for the attention of prospective flyers by computers, sports, etc. that influences participation – not the rules. I predict that a significant number of older flyers will not want to "go backward" to reduced performance and will choose to quit flying F1d. I know of no mass of flyers waiting for a new model specification to begin flying F1d, although we all hope those flyers do exist somewhere.

As in all things Indoor, time will tell.

Steve Brown
297 Hartman Ct.
San Dimas, CA 91773
stevebrown@lycosmail.com



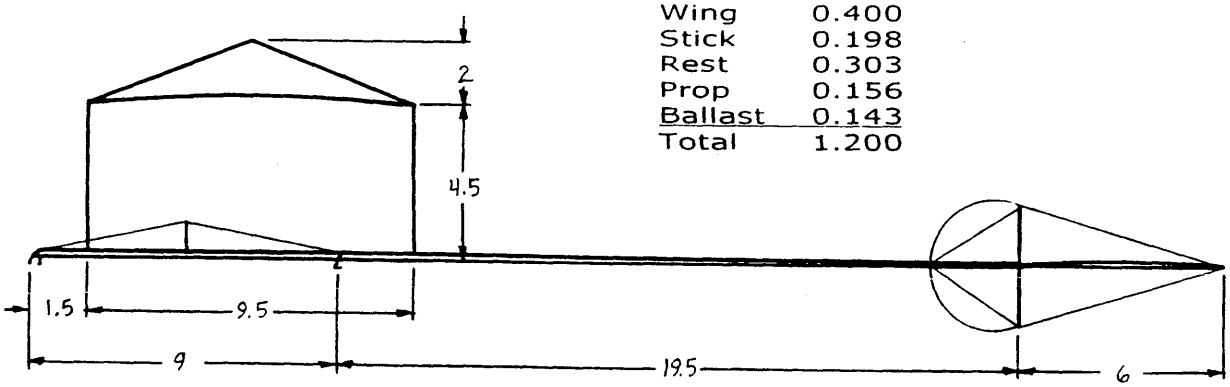
NEW RULES F1D

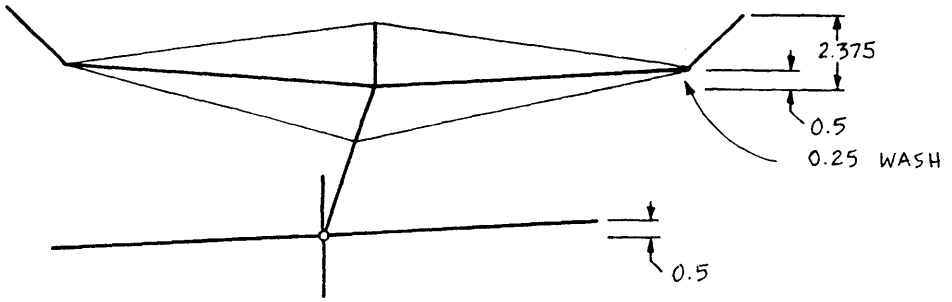
A 55CM PROTOTYPE

BY STEVE BROWN

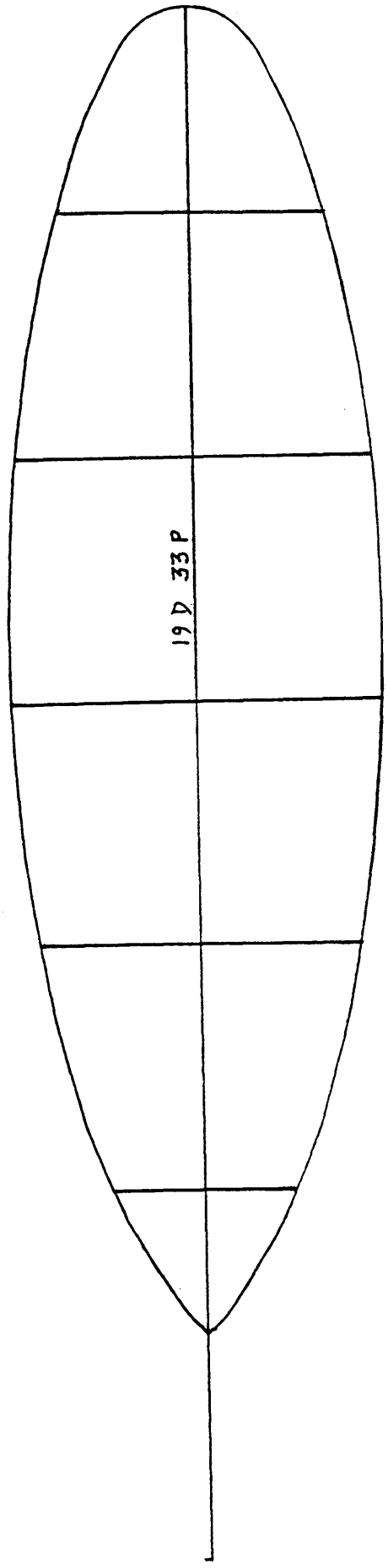
Typical Weights (gm)

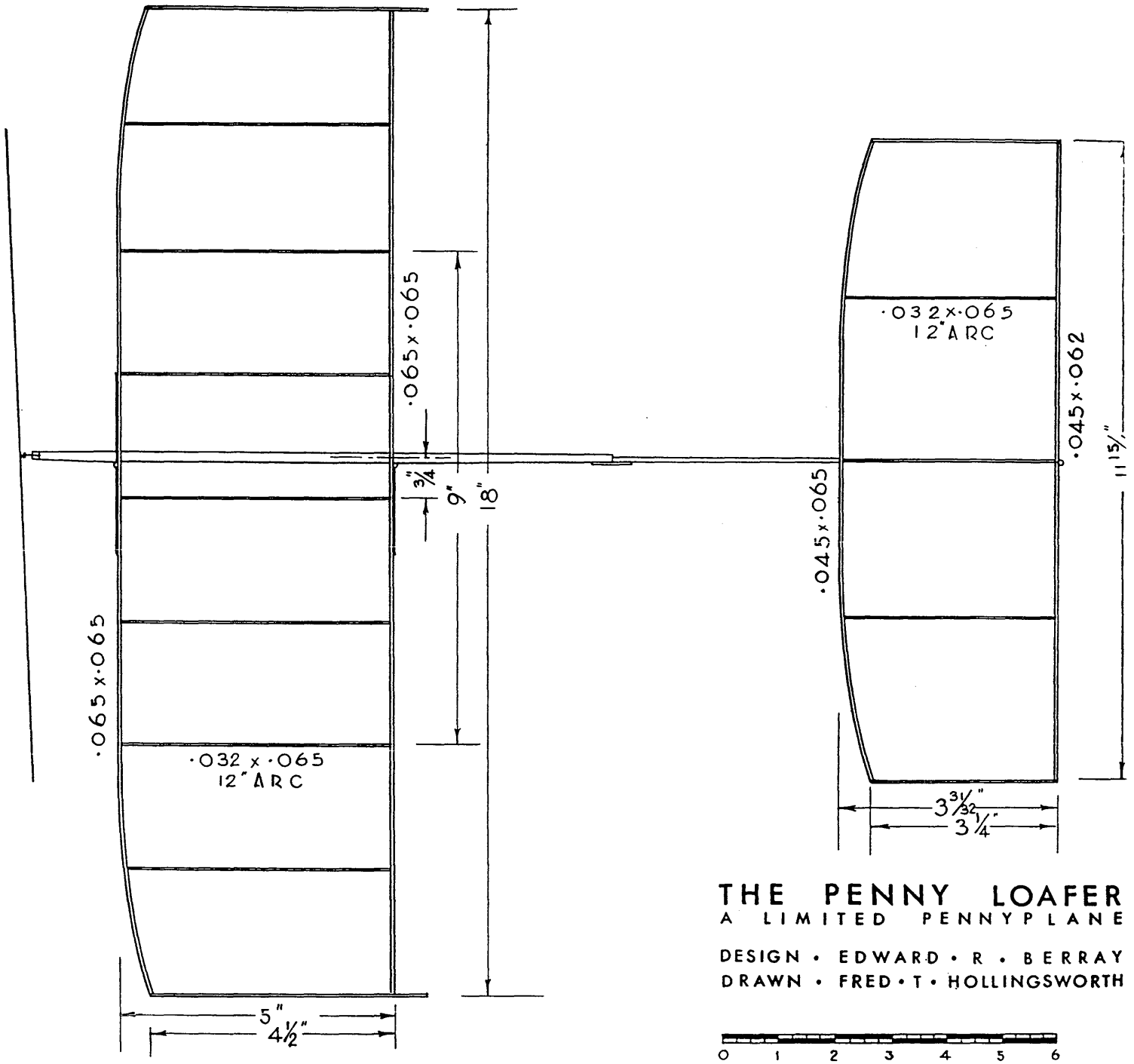
Wing	0.400
Stick	0.198
Rest	0.303
Prop	0.156
Ballast	0.143
Total	1.200





WING	
SPARS	.033 X .060 6.2 LB.
TIPS	.030 X .047 5.5 LB.
MIDDLE RIBS (3)	.030 X .047 5.2 LB.
COMPRESSION RIBS (2)	.030 X .060 5.2 LB.
WINGPOSTS	.035 X .055 → .035 X .045 6.2 LB.
	(3) .003 BORON
	FULL LENGTH, SIDES & BACK
CABANE	.030 X .045 5.5 LB.
BRACING	.0003 TUNGSTEN
AIRFOIL	3.5% ELLIPSE
STABILIZER	
SPARS	.028 X .050 → .024 X .032 5.7 LB.
CENTER RIB	.025 X .045 5.5 LB.
OUTER RIBS	.025 X .032 5.5 LB.
BRACING	.0003 TUNGSTEN TO REAR OF CENTER RIB ONLY
AIRFOIL	2% ARC
FIN	
POST	.030 X .055 → .030 X .040 5.5 LB.
OUTLINE	.004 BORON
MOTORSTICK	
TUBE	.013 4.4 LB. .210 I.D.
	(3) .004 BORON: 12, 4, 8 O'CLOCK
WEBS	.020 4.5 LB.
CAP	.013 4.4 LB.
BRACING POST	.045 X .045 → .035 X .035 X 1.25 6.8 LB.
HOOK	.012 MUSIC WIRE
BEARING	HARLAN F1D
BRACING	(1) .001 TUNGSTEN
BOOM	
TUBE	.010 4.5 LB. .240 I.D. → .130 I.D.
	(2) .003 BORON: 12, 6 O'CLOCK
PROP	
SPARS	.065 X .075 → .030 X .030 5.5 LB.
OUTLINE	.023 X .025 4.5 LB.
RIBS	.023 X .025 4.5 LB.





THE PENNY LOAFER

A LIMITED PENNYPLANE

DESIGN • EDWARD • R • BERRAY

DRAWN • FRED • T • HOLLINGSWORTH

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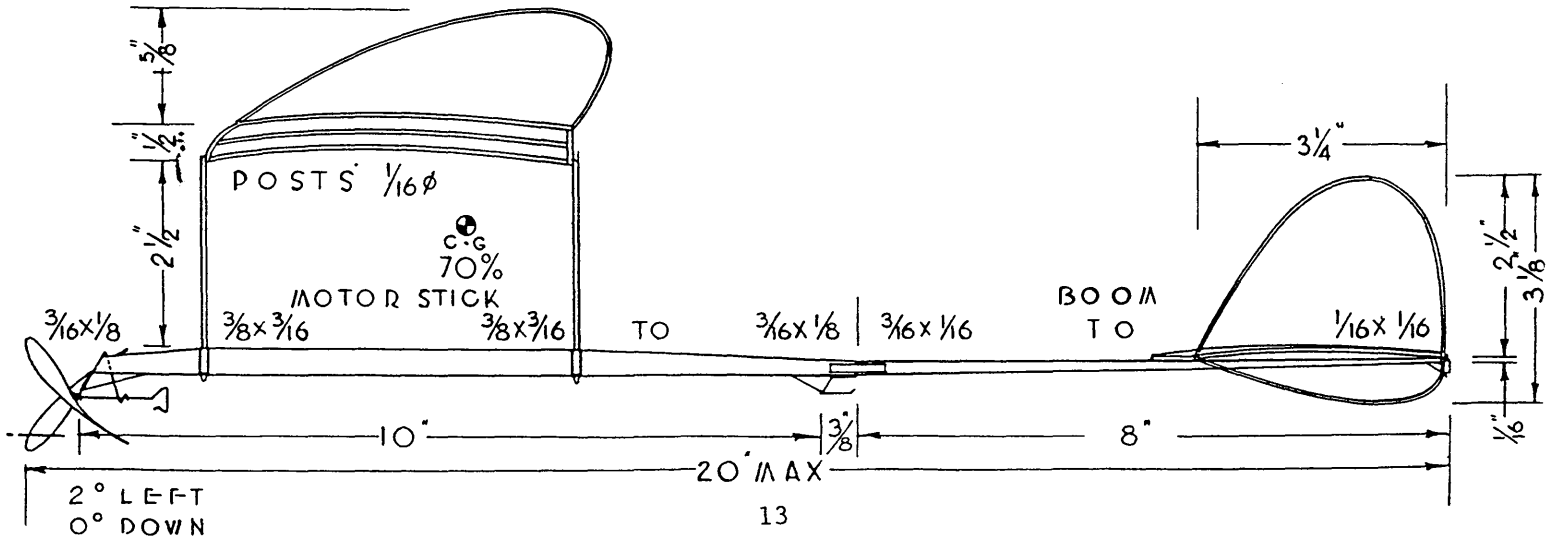

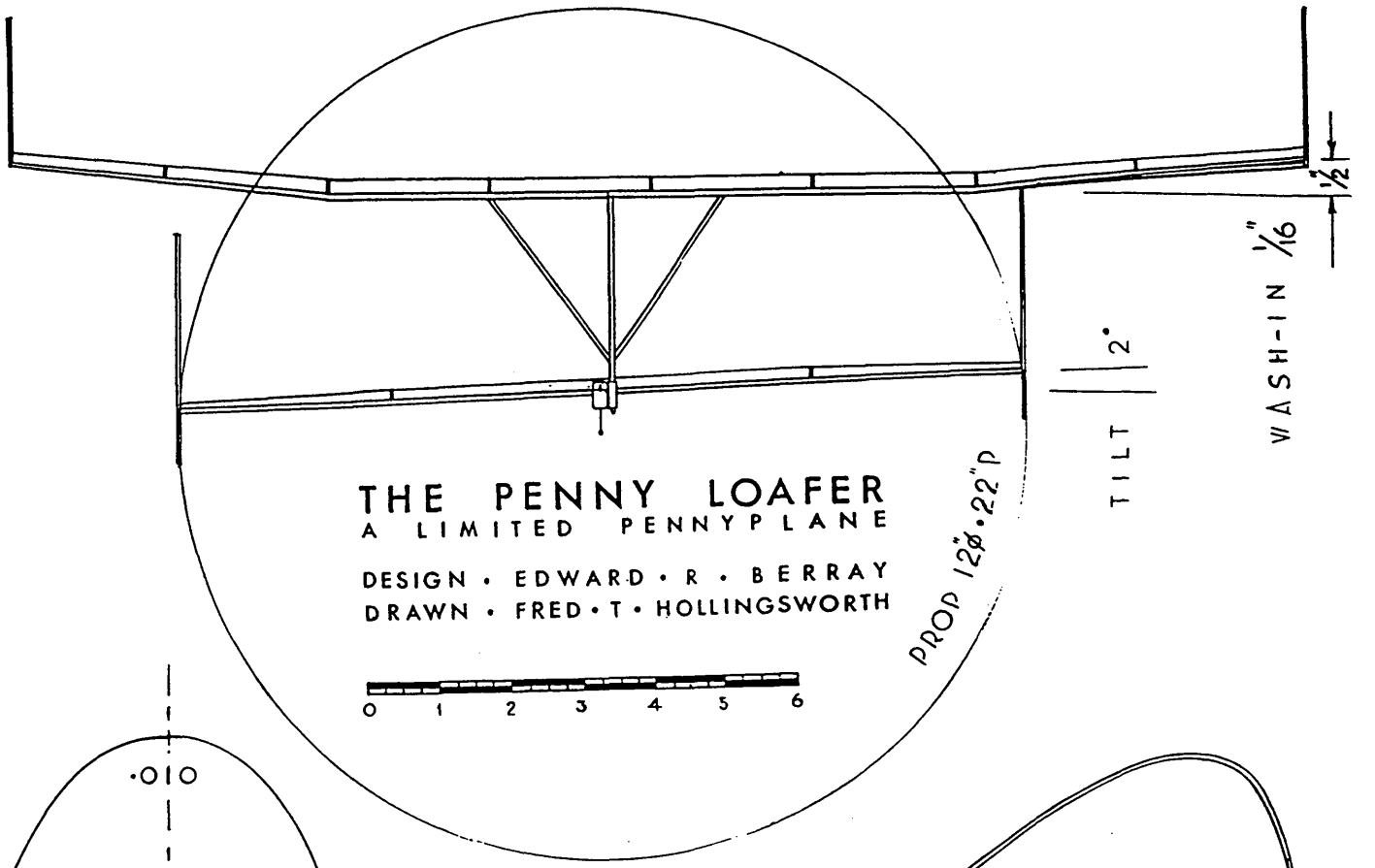

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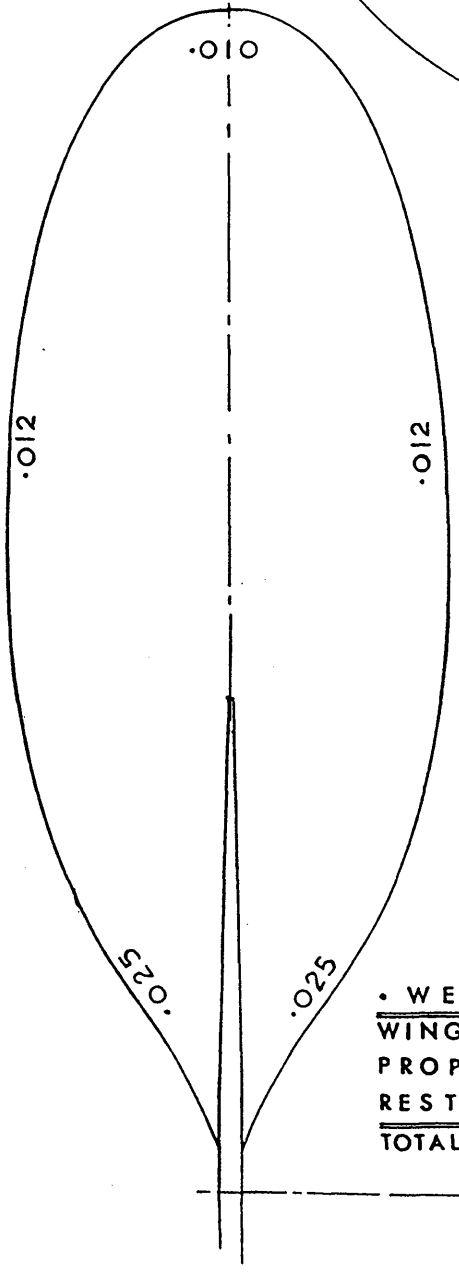
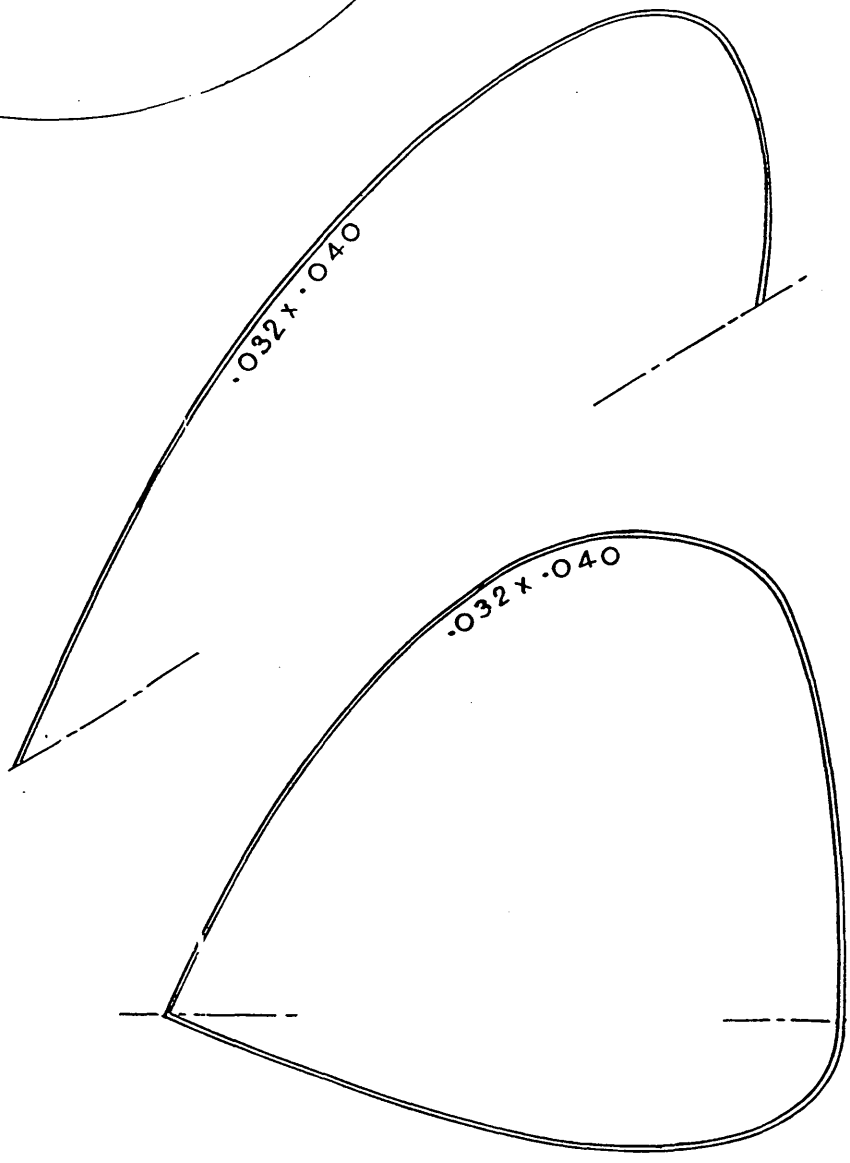




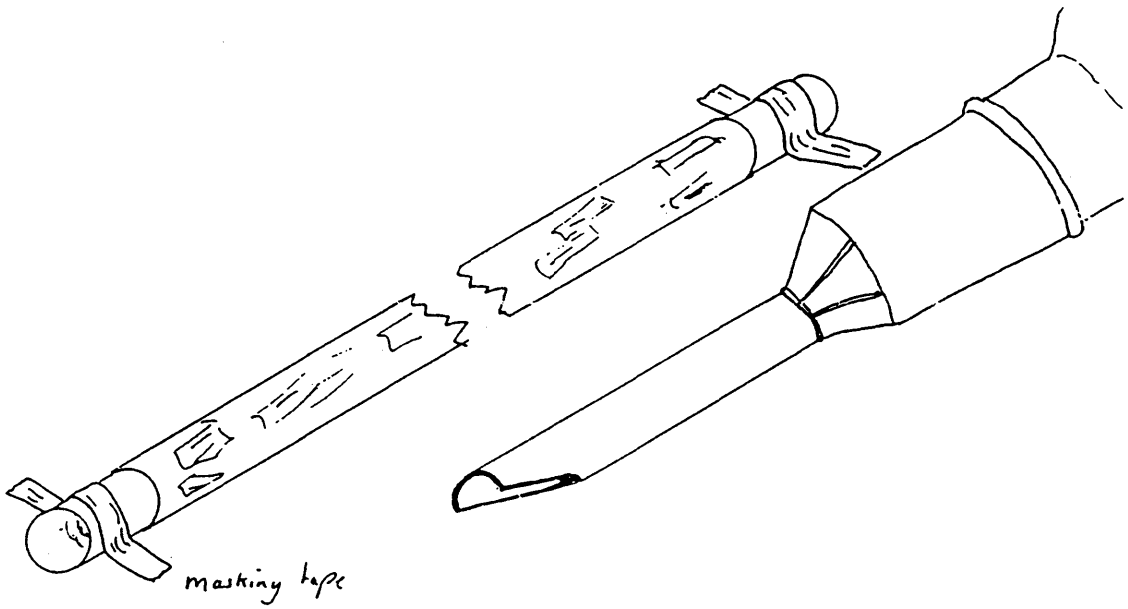
• WEIGHTS •	
WING	•900 g
PROP	•812
REST	1•411
TOTAL	3•123 g

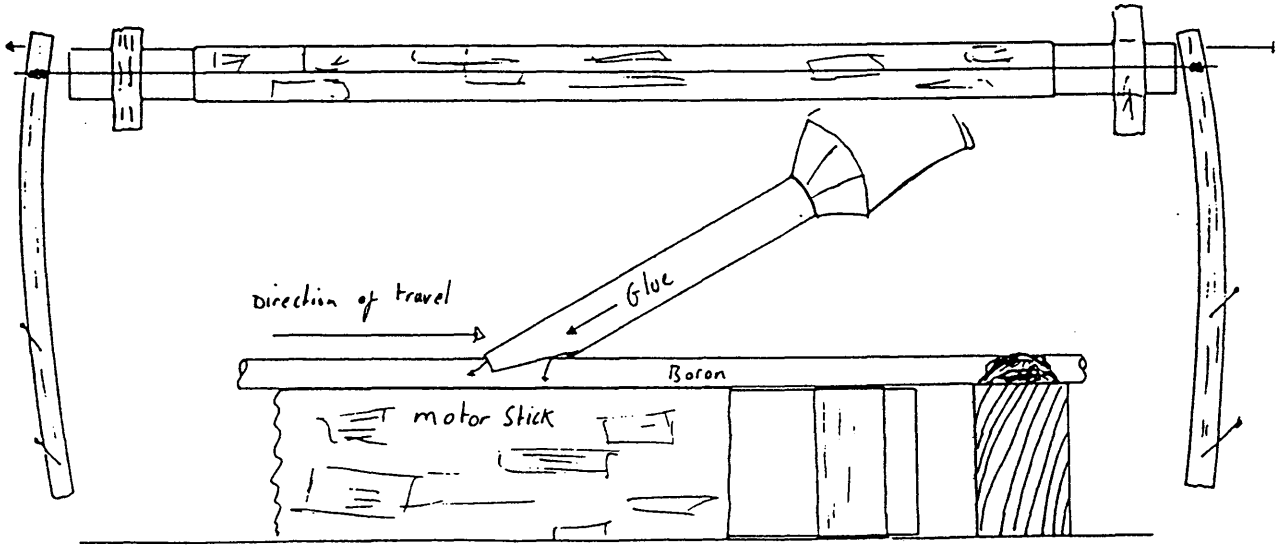
Applying boron to motorsticks

by John Tipper (GBR)

I have tried many different methods to apply boron to motor sticks and have found this one to be the best. The boron stays on straight and has never parted from the motor stick. The weight penalty is only about 2mg for 16ins of boron - a small price to pay for a much stronger motor stick.

1. Tape motor stick down to work bench by the mandrill.
2. Select two pieces of medium balsa 5mm wide x 120mm long, the depth to be the overall diameter of the motor tube.
3. Glue balsa sticks onto each end of boron and allow to dry - this joint needs to be very secure. Carefully file off the point on a 24 gauge hypodermic needle (see drawing). This will leave a half round groove in the end of the needle. I use a small high speed drill and fine cut-off blade for this, so as to leave a clean edge on the needle.
4. Pin balsa sticks to work bench so that boron is under tension and in the correct place on the motor stick.
5. Apply about 8-10 dots of glue along boron to secure in a straight line and allow to dry.
6. Mix up a solution of 20% Duco and 80% Acetone and fill glue gun (glue guns available from F1D Indoor Supplies).
7. Position the half round section of the needle onto the boron and run a bead of glue along the length of the motorstick. The needle will run along the boron like on rails. The glue will coat the boron and form a very small fillet along its length. Allow the glue to dry before cutting end of boron from balsa sticks, then repeat procedure as above for other boron positions.





5/99 Verses 7/97 Tann II

by Larry Coslick

There's such a good variety of rubber, that it's difficult to know which batch to use if you fly as many events as I fly. I wouldn't use 7/97 or 2/99 in my Bostonian or Manhattan, because two motors exploded just after the blast tube was removed. On the other hand, 7/97 works great on most other models provided you don't wind it too hard and the temperature is not too hot. Although my tests are not complete, 5/99 could fill the bill for all my models in the near future. 5/99 has good energy, its tough, and it will take more winds than 7/97.

To make this test I weighed two strips of 1/8th rubber from each batch and found out that 5/99 was 6.7% lighter than 7/97. After correcting for the difference in weight, I had three motors from each batch that were within 2 % of each other in weight. Each motor was pre-wound to 400, 800, and 1100 turns. All six motors stretched approximately one inch during the break in period, and had a maximum stretch of 1.4" after five winds. Each motor was wound to .6 in. oz. of torque and then backed off to its ½ wind torque. All of the 5/99 motors held up through the fourth wind and two broke at around 2300 turns of the fifth wind. One of the 7/97 motors broke at 1600 turns of the 2nd wind and one at 300 turns of the 3rd wind. One loop of each batch held up through five winds and that's where I concluded the test.

(Motors. .072 x 16")

7/97 Wind 1 -- 2140 Turns -- ½ winds -- .135 in. oz.
Wind 5 -- 2300 " -- " " -- .13 " "
Winds 2 through 5 showed ½ winds tq. of .13 for 7/97

5/99 Wind 1 -- 2300 Turns -- ½ winds -- .13 in. oz.
Wind 5 -- 2480 " -- " " -- .13 in. oz.

Note: The rubber was lubed before tying the knot and there was no chafing near the knot.

Basic Rubber Testing Procedures

To get worth while results when testing one batch of rubber against another, it is important to test equivalent weights of rubber as opposed to equivalent sizes. Since the sample test outlined concerns itself with conservative maximum turns, torque at half winds, rubber toughness, and whether the rubber grapevines or not, matching the weight is the best method.

Start by tying three or four loops of each batch and be careful to get the weights as close together as possible. I lightly lube the end of the loop before tying the knot to prevent fraying and this procedure really works. Break the motor in by winding in stages with the final wind at about half the expected maximum winds. Once broken in, wind the motor to 130% of launch torque for medium cross-section motors. (.070"). Thinner motors can go as high as 180%. Once the motor is wound, back off half of the winds and torque. The best rubber will take the most repeated windings while delivering good torque.

The ultimate test for good indoor rubber is to fly one batch of rubber against another. Use a very reliable, repeatable model. The more certain you are that a flight time difference is from the rubber, the better. Make sure that you are using nearly identical motors, launch torque, and O rings to help eliminate any stray factors. Use quarter of half motors to prevent the model from touching, since this will invalidate any test you might make.

1999 USIC
PICTURE CAPTIONS:

1. East Tennessee State University Dome, Site of the USIC in 1999
2. John Koptonak launches his third place Mini-Stick.
3. Rich MacEntee judging scale.
4. Mike Thomas's beautiful Mile Sparrowhawk
5. Tom Sova's Pro 20 about to touch down.
6. Mike Thompson hides behind the many awards he must give out.
7. Michelle Boyd's General Aristocrat just after having its fin damaged in a mid-air collision.
8. John Blair launches one of his many scale models.
9. Bob Romash's cute little Northrop flying wing.
10. Larry Loucka launches his Pennyplane.

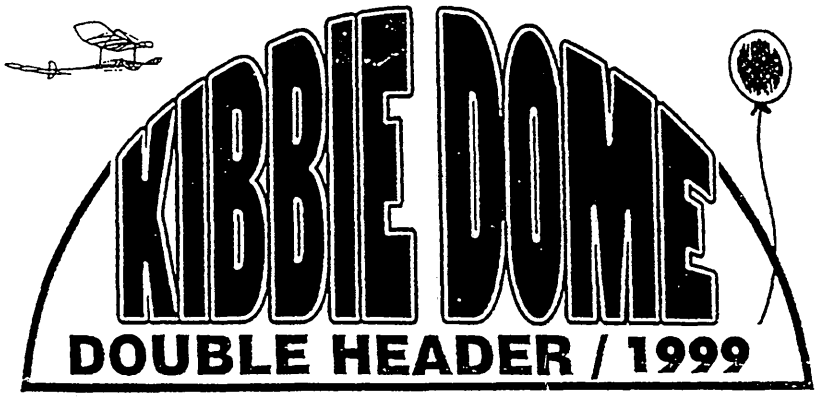
11+12. Ron Ganser's wonderful 1911 Cessna, first in AMA scale.

13. Nikki Spradling working on her Mooney designed Monocoupe.
14. Walt Van Gorder and John Kagan ready to catch their models.
15. Jack McGillivary WW1 Junkers scale, first in WWI mass launch.
16. Dave Linstrum's M20b and Bristol Brownie Pistachios.
17. Nice looking Dehaviland Moth Minor.
18. F.R.O.G. headed for the ceiling. John Diebolt won this event with a great flight of 8:02.
19. Rich Miller winding his Coconut scale Zlin agplane.
20. Bernie Hunt retrieving his Intermediate stick.
21. An unusual site, a triple mid-air!
22. Dick Hardcastle prepairing his Intermediate stick for flight.
23. Steve Gardner's colorful Bostonian with computer generated tissue.
24. John Diebolt launching his Pennyplane.
25. Holly Vonasek flying her F1L EZB
26. Just some of the huge Smyrna scale airforce.
27. Tim Lavender's Breuget scale model.
28. Tom Sova launches his F.R.O.G.
29. Rich MacEntee's Cessna Birddog.
30. Larry Coslick puts up a testflight with his F1D.
31. F1M model in flight. This could become a popular event.
32. Jennifer Smith's Coconut scale model up in the rafters. Won 2nd in Coconut scale mass launch.
33. Bob Romash with his fun flying foam airforce.
34. Belanca observation scale model in flight.
35. Voison 1911 Hydroplane scale model. Popular design due to bonus points.
36. Limited Pennyplane in flight. This was the most popular event with 54 entries.

37+38. Larry Coslick's Record setting Bostonian. Best flight 6:18!!

39. Marcus Conners launching his limited Pennyplane. He was 2nd in junior Limited Pennyplane.
40. Dick Hardcastle tests his Limited Pennyplane.
41. Larry Loucka readies his ROG Stick for flight.
42. A nicely built scale model that has the editors of INAV stumped!
43. Tim Lavender's Martynside biplane.
44. Larry Loucka receiving the first place award in Pro 20.
45. Bernie Hunt launches his Mini-Stick. He took 2nd in this event and won the mass launch.
46. Steve Gardner launching his limited Pennyplane. He took first and set a site record of 16:34.

47. Steve Gardner's Limited Pennyplane in flight.
48. Davis DA5 Peanut.
49. Robert Stevens with his P-51 Mustang scale model.
50. Nikki Spradling launches her Limited Pennyplane.
51. Tim Lavender's Coconut cruises along.
52. Jack Boone's very interesting B-17 profile model.
53. Dick Hardcastle with his Pennyplanes.
54. John Blair's pretty Consolidated Dime Scale model.
55. Mike Thomas Receives the award for Pioneer scale from Abram Van Dover.
56. Rich MacEntee and Dave Linstrum judge Pistachio Scale. Emil Schutzel won this event with a pair of two-minute plus flights.
57. Winners waiting for awards. From left to right they are: Tom Sova, Larry Loucka, Fred Tellier, seated is Emil Schutzel, Tim Johnson, and Peter Olshefsky.
58. Rich MacEntee's Turboporter.
59. Bob Romash launches his 6th place limited Pennyplane.
60. Bill Landrum inspects his Pennyplane.



UNIVERSITY OF IDAHO - MOSCOW, IDAHO

KIBBIE DOME OPEN FOR FLYING – 8:00 am TO 8:00 pm

EVENT 1. (JULY 24,25,26,1999) KIBBIE DOME ANNUAL

All AMA Official Indoor Events. Six official flights per event (which can be flown any time all three days – 9:30 AM to 8:00 PM)

Hand Launched Glider and Catapult Glider flights 8:00AM to 9:30 AM only, all three days. Nine (9) official flights allowed.

SPECIAL EVENTS: Pro-20, Novice EZB, P-24, A-6, and NON-RADIO CONTROLLED ELECTRIC F.F. (30 gram max weight for ELECTRIC F.F.)

ENTRY FEE: Open & Senior– $50.00 Junior Flyers – $25.00

There are no additional event charges.

Table and 2 chairs rental: $5.00

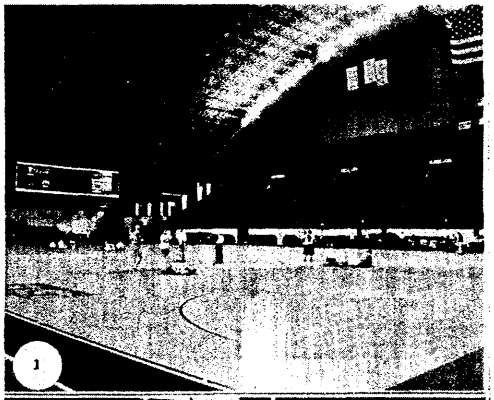
CONTEST DIRECTOR: Andrew Tagliafico – Call (503) 452-0546 for additional information.

EVENT 2 (JULY 24,25,26,1999) FLYING SCALE

Flying Aces Rules

SCALE CONTEST DIRECTOR: Dave Haught Call (208) 773-5806 for additional information.

Modelers with cars must stop at University Visitor Information Center, 645 W. Pullman Road (across from Hardee's Restaurant) to obtain a visitors parking permit for Monday, July 26, 1999. Cost is approximately $1.00



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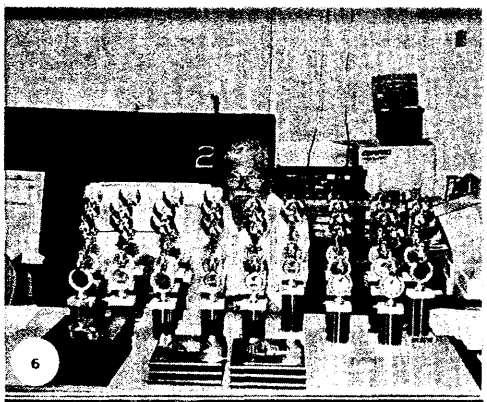

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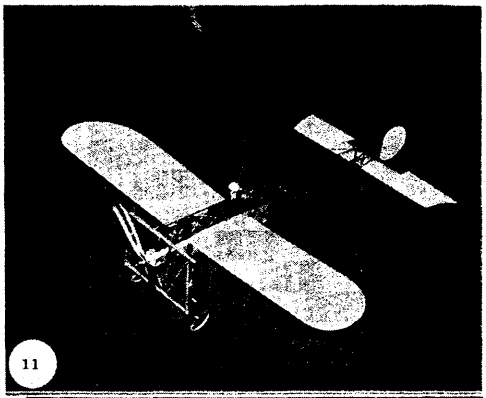

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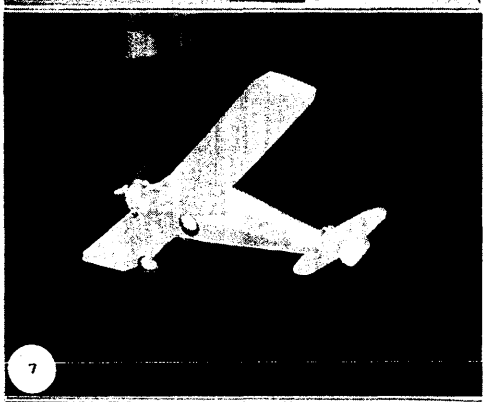

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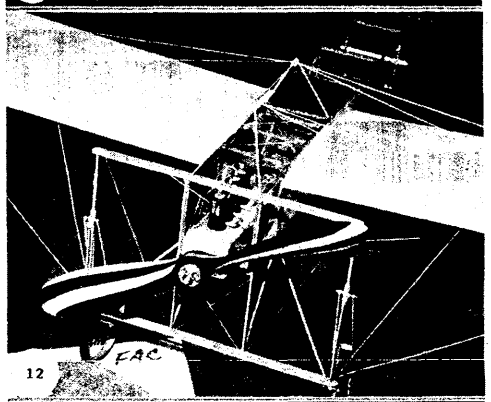

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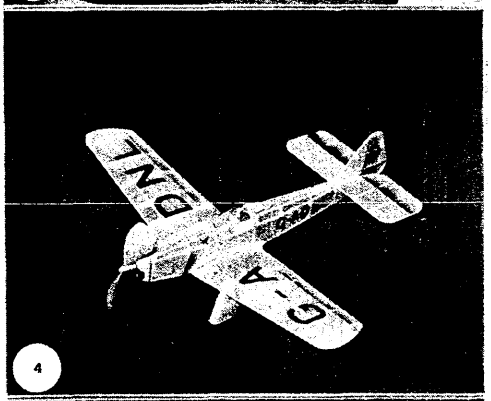

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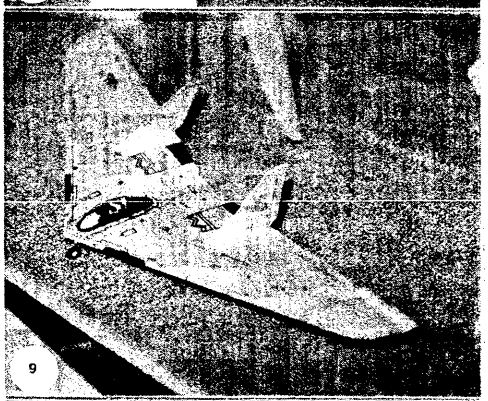

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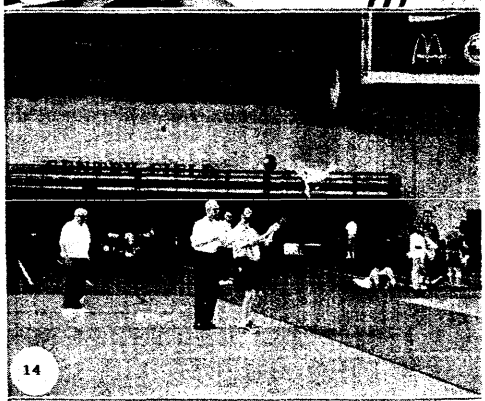

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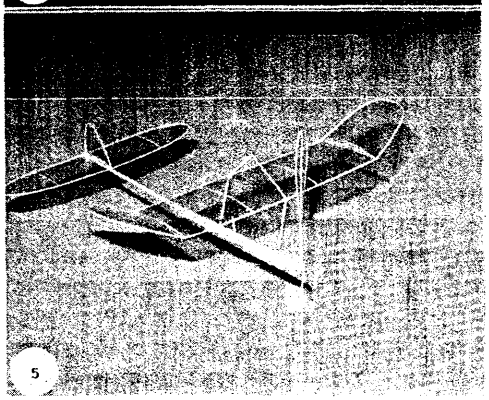

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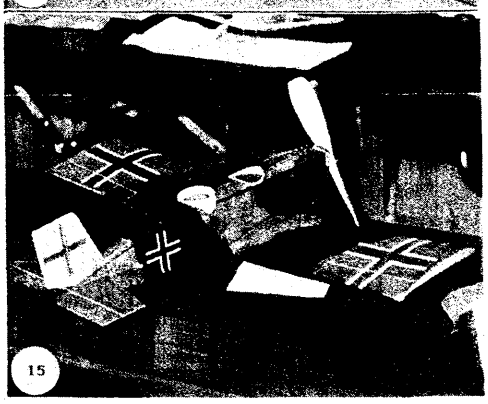

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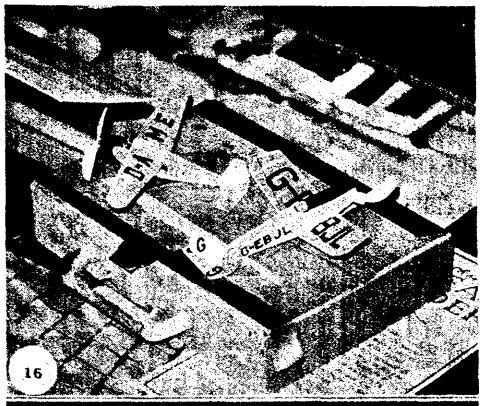
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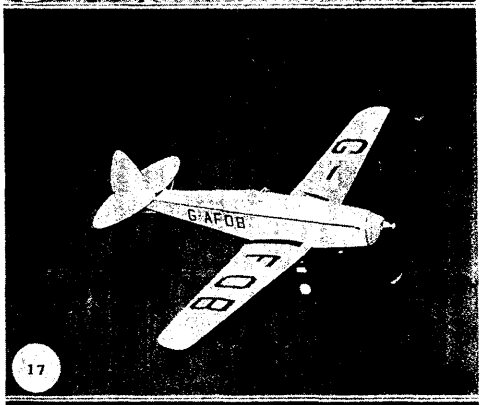

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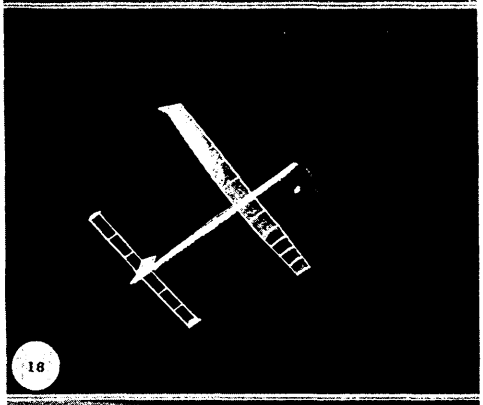
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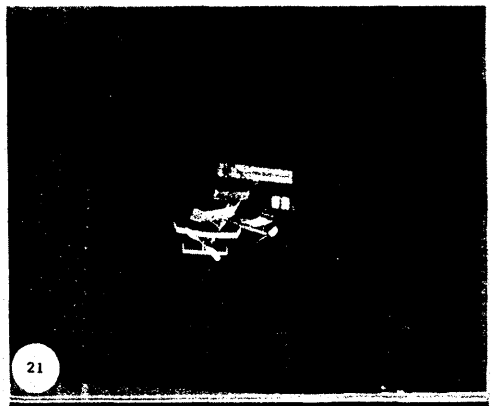
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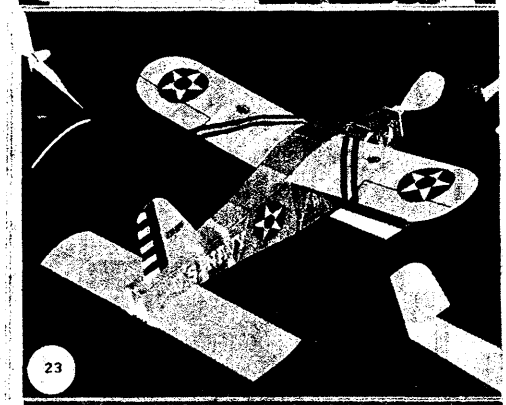
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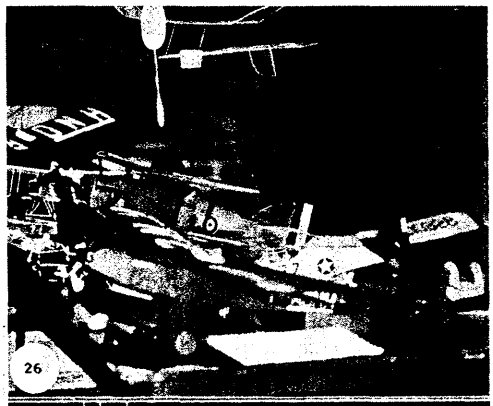
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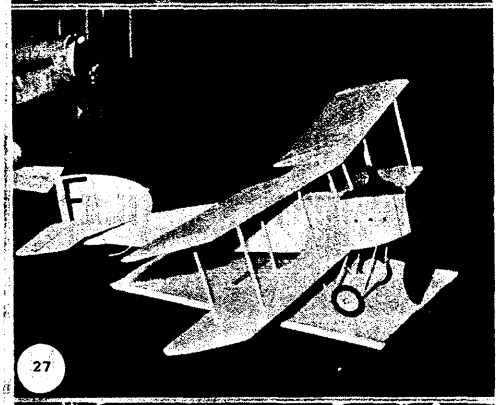
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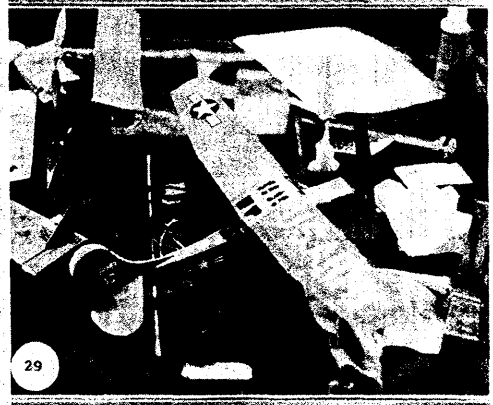
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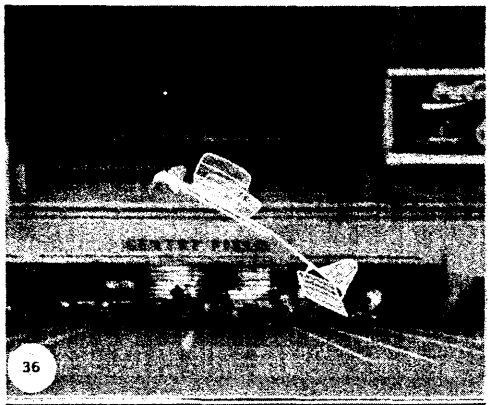
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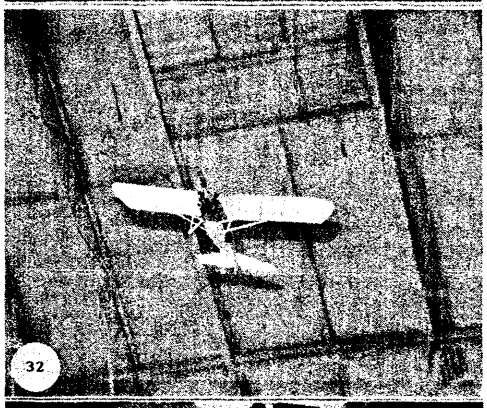
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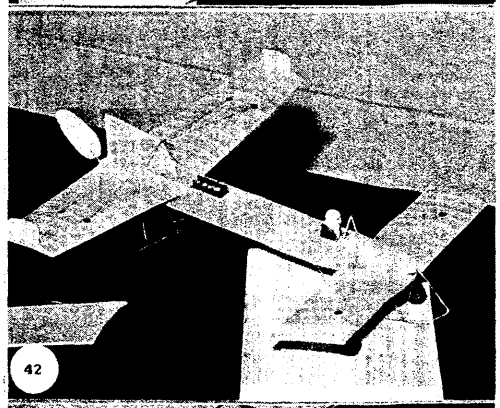
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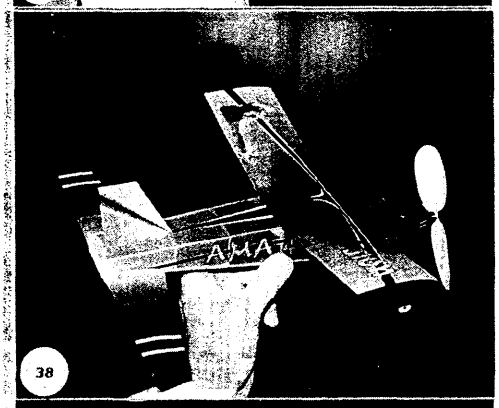
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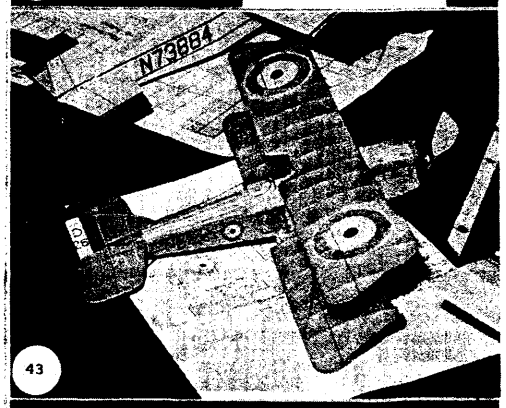

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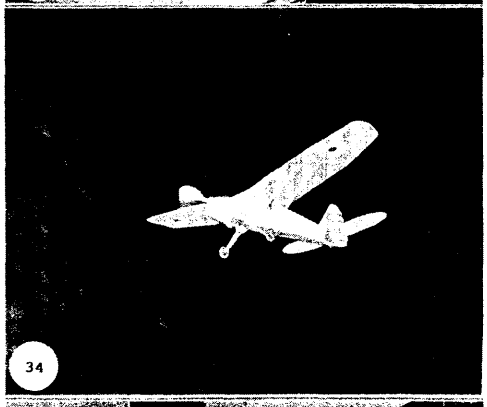
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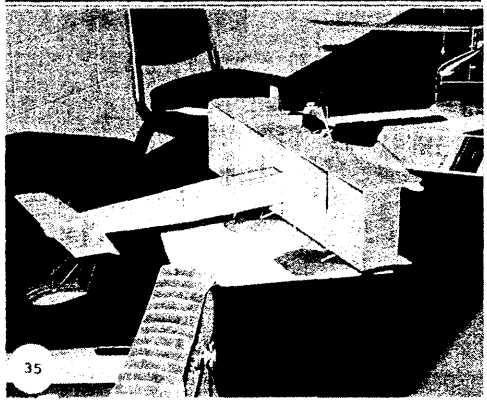
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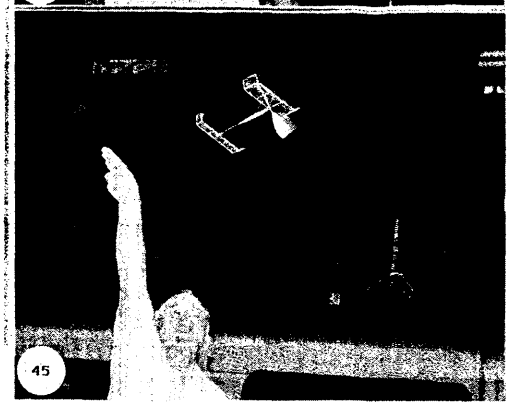
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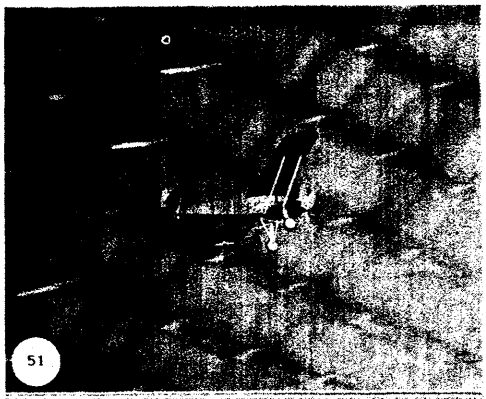
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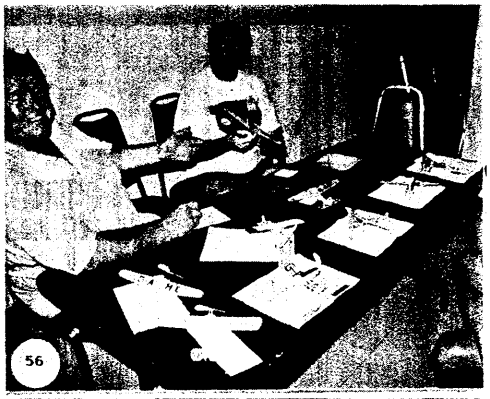
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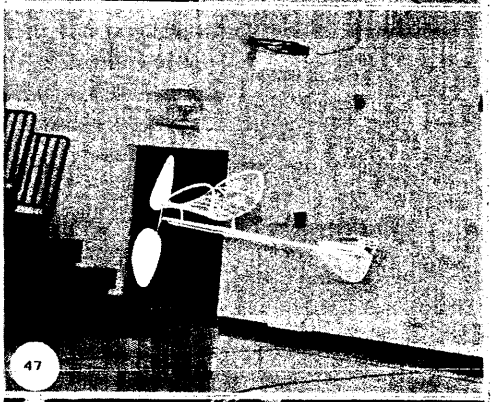
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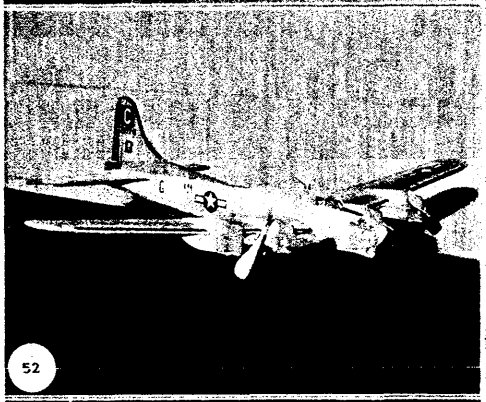
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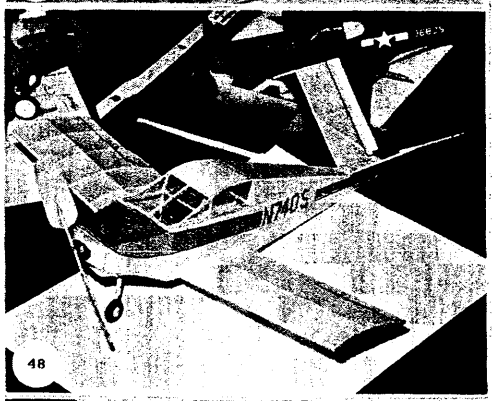
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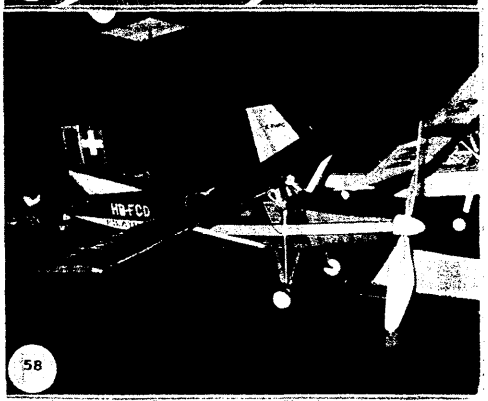
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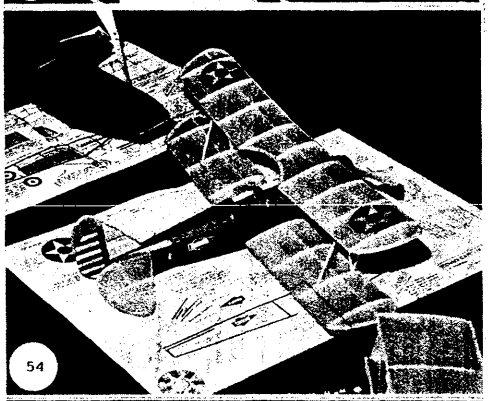
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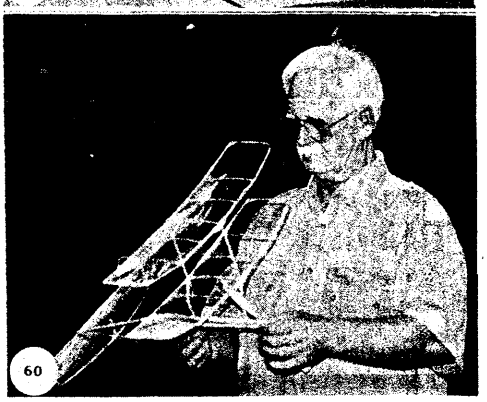
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USIC 1999 NO-CAL Scale Final Scores Jr/Sr

Place	Contestant	Flt 1	Flt 2	Flt 3	Flt 4	Flt 5	Best Flt	2nd Best	Total
1	Robert Stephens	2:00	2:02	2:05	2:01		2:05	2:02	4:07
2	Patrick Anderson	1:48	1:18	2:05	1:50	1:24	2:05	1:50	3:55
3	Joseph Marriman	1:23	1:42				1:42	1:23	3:05
4	Stephanie Victory	1:12	1:27				1:12	1:27	2:39

USIC 1999 Coconut Scale Final Scores Jr/Sr

Place	Contestant	Flt 1	Flt 2	Flt 3	Flt 4	Flt 5	Scale Points	Flight Points	Total
1	Michelle Boyd	2:20	2:35				1	1	2
2	Adam McCord	2:14	2:04	2:08	2:32		2	2	4
3	Stephanie Victory	1:26	0:56				3	4	7

USIC 1999 Bostonian Final Scores Jr/Sr

Place	Contestant	Flt 1	Flt 2	Flt 3	Flt 4	Flt 5	Best Flight
1	Patrick Anderson	1:21	1:48	1:20	1:56	1:47	1:56
2	Joseph Falconberry	1:12	1:16				1:16
3	Nikki Spradling	0:42	0:44				0:44
4	Stephanie Victory	0:15					0:15

USIC 1999 Penny Plane Final Score Jr/Sr

Place	Contestant	Flt 1	Flt 2	Flt 3	Flt 4	Flt 5	Best Flight
1	Michelle Boyd	6:30	9:25	10:10	11:01	9:34	11:01
2	Marcus Conner	9:27	9:29				9:29
3	Robert Stephens	8:25	8:43	8:59			8:59
4	Nikki Spradling	3:22	5:50	5:23	6:42	7:00	7:00
5	Stephanie Victory	5:46	4:46	3:37			5:46
6	Patrick Anderson	5:30	4:37	4:17			5:30

USIC 1999 PEANUT SCALE #505 - FINAL SCORES

PLACE	CONTESTANT	AMA NO.	AIRCRAFT	FLIGHT 1	FLIGHT 2	FLIGHT POINTS	SCALE POINTS	TOTAL POINTS
1	Ganser, Ronald	7532	1911 Voisin Hydroplane	84	80	82	145	227
2	Mac Entee, Richard	102085	Poitier 100TS	94	95	94.5	95	189.5
3	Koptonak, John	58027	Lacey M-10	146	131	92.75	94.5	187.25
4	Romash, Robert	130061	Infinity 1	51.4	46.7	48.5	85	133
5	Thomas, Mike	615041		115	120	117.5	Did not submit for judging	117.5
	MacEntee, Rich	102085	Andreasen Biplane	57	55		105	161
	Crawford, Dohrman	601965						DNF
	Singer, Len	209081						DNF

USIC 1999 INDOOR FLYING RUBBER SCALE #507

PLACE	CONTESTANT	AMA NO.	SUBJECT	BEST FLIGHT	2ND BEST FLIGHT	AVERAGE OF BEST 2 FLIGHTS	FLIGHT POINTS	SCALE POINTS	TOTAL POINTS
1	GANSER, RONALD	7532	1911 Cessna	2:25	2:23	2:24	2:34	100	254
2	THOMAS, MIKE	615041	1935 Miles Sparrowhawk	2:25	2:09	2:14	2:24	91	235
3	BLAIR, JOHN	29698	The Longster	0:41		0:41	0:51	92	143
4	GRANT, JIM	149477	Cranwell CLA 3	1:11		1:11	1:21	54.5	135.5
					FINAL SCORES				

USIC 1999 DIME SCALE SCORING: Total of best 3 flights. Unlimited attempts.

PLACE	CONTESTANT	PLANE	BONUS	FLT 1	FLT 2	FLT 3	TOTAL OF 3 FLTS + BONUS
1	McGillivray, Jack	Arado	10	126	129	131	396
2	Thomas, Mike	Sparrowhawk	10	136	90	129	365
3	Aronstein, David	Heath	3	93	121	113	330
4	Linstrum, David	Heath	3	77	79	80	239
5	Blair, John	Farman	0	59	66	59	184
6	Gardner, Steve	Bristol Brownie	10	43	61	55	169
7	McLellon, Bob		0	46	46	48	140
8	Blair, John	Consolidated	15	58	62		135
9	Linstrum, David	Bristol	10				10

USIC 1999 F1D #203 - FINAL SCORES

PLACE	CONTESTANT	AMA NUMBER	FLIGHT 1	FLIGHT 2	FLIGHT 3	FLIGHT 4	FLIGHT 5	FLIGHT 6	TOTAL OF 2 OF 8 FLIGHTS
1	Kagen, John		44:41	48:48					93:29
2	Coslick, Larry	4652	45:07	38:23	42:05	45:05			90:12
3	Thomas, Mike	615041	32:10	36:41					68:51
4	Hulbert, William	1317	25:00	28:21	30:41	29:27	32:14	7:29	62:55
5	Tellier, Fred	645957	33:43	27:06	28:36	27:19			62:19
6	Vallee, Thomas	1126	22:59	19:35	30:46				53:45
7	Leonard, Nicholas, Jr.	497460	16:31	17:06	19:42	19:45	24:15		44:00
8	Doig, Richard	5392	33:38						33:38
9	Burke, Edward	153313	19:36	13:24					33:00
10	Leonard, Nick A.	497461	10:08						10:08
	Chilton, Stan	L30							DNF
	Clem, Jim	L55							DNF
	Hacker, Vernon	L304							DNF
	Hunt, Bernard	618510							DNF

USIC 1999 HL STICK #201 - FINAL SCORES

	CONTESTANT	AMA NO.	FLT 1	FLT 2	FLT 3	FLT 4	FLT 5	BEST.FLIGHT
1	Coslick, Larry	4652	41:44	ATT	43:09	46:48		46:48
2	Kagen, John		18:55	ATT	43:30	42:54	ATT	43:30
3	Doig, Richard	5392	29:07	34:48	32:20	38:31		38:31
4	Thomas, Mike	615041	34:46					34:46
5	Hardcastle, Richard	847	28:46	32:33	29:09	22:29		32:33
6	Tellier, Fred	645957	30:33					30:33
7	Vallee, Thomas	1126	26:48					26:48
8	Sova, Tom	473169	23:31	25:18				25:18
9	Burke, Edward J.	153313	22:31	8:35				22:31
10	Hacker, Vernon	L304	13:02	18:20	22:05			22:05
	Grant, Jim							DNF
	Chilton, Stan	L30						DNF
	Loucka, Larry	1210						DNF

USIC 1999 AUTOGIRO #211. FINAL SCORES

PLACE	CONTESTANT	AMA NO.	FLT 1	FLT 2	FLT 3	FLT 4	FLT 5	BEST FLIGHT
1	Ganser, Ronald	7532	13:44	13:59	15:21	16:23		16:23
2	Thomas, Mike	615041	8:08	10:22	16:16			16:16
3	Slusarczyk, Don		14:10	15:19	15:32	16:11	15:08	16:11
	Diebolt, John		7:21	9:32	10:06	8:36		10:06
	Rash, Fred	63458	8:36	7:25	8:55	7:51	7:08	8:55
	Oleson, Douglas	480646						DNF

USIC 1999 CABIN ROG #204 FINAL SCORES

PLACE	CONTESTANT	AMA NO.	FLT 1	FLT 2	FLT 3	FLT 4	FLT 5	FLT 6	BEST FLIGHT
1	Loucka, Larry	1210	22:45	28:42					28:42
2	Thomas, Mike	615041	22:50	26:44					26:44
3	Ganser, Ronald	7532	22:42	21:37					22:42

USIC 1999 MANHATTAN #205 - FINAL SCORES

PLACE	CONTESTANT	AMA NO.	FLT 1	FLT 2	FLT 3	FLT 4	FLT 5	BEST FLIGHT
1	Van Gorder, Walter	19912	11:32	13:36	13:38			13:38
2	Coslick, Larry	4652	13:28	12:47	12:24	13:22		13:28
3	Thomas, Mike	615041	13:00	12:49				13:00
4	Marett, John	616261	8:23	12:39	12:19			12:39
5	Grant, James	159477	9:45	12:14	3:04	6:45		12:14
6	Schutzel, Emil	508384	10:31	9:42	10:41	10:57		10:57
7	Tellier, Fred	9125MAC	4:28	6:29	8:30	8:53	10:29	10:29
8	Ganser, Ronald	7532	8:37	9:15	9:48	9:46		9:48
9	Slusarczyk, Chuck	2643	8:35	9:25				9:25
10	Kehr, Joe	549294	7:53	8:53				8:53
11	Zufelt, James	615152	5:32	5:09	6:19	6:37	7:44	7:44
12	Koptonak, John	58027	4:03	7:04	7:04			7:04
	Loucka, Larry	1210						DNF
	Raymond-Jones, D.	645958						DNF

USIC 1999 HELICOPTER #209 - FINAL SCORES

PLACE	CONTESTANT	AMA NO.	FLT 1	FLT 2	FLT 3	FLT 4	FLT 5	BEST FLIGHT
	Thomas, Mike	615041	ATT	13:25				13:25
	Vallee, Thomas	1126	5:59	5:57	7:54	8:26	9:42	9:42
	Loucka, Larry	1210	5:08	9:30				9:30
	Diebolt, John		5:02	7:00	6:54	7:24		7:24
	Romash, Robert	130061	5:16	5:36	6:30			6:30
	Tellier, Fred	645957	5:09	4:09				5:09
	Leonard, Jr., Nicholas	497460	1:30	1:01				1:30
	Leifer, Louis	646263						DNF

USIC 1999 #206 EASY B - FINAL SCORES

PLACE	CONTESTANT	AMA NO	FLT 1	FLT 2	FLT 3	FLT 4	FLT 5	BEST FLIGHT
1	CAILLIAU, LAWRENCE	79985	29:59	29:53	30:46			30:46
2	COSLICK, LAWRENCE	4652	24:51	30:41	29:52	29:34	26:42	30:41
3	KAGAN, JOHN		24:00	28:19	16:35			28:19
4	SLUSARCZYK, DONALD	5490	7:33	25:18	28:13	12:13	10:17	28:13
5	HUNT, BERNARD	618510	22:32	24:45	25:03	27:09	1:31	27:09
6	THOMAS, MIKE	615041	26:08	5:43				26:08
7	MC GILLIVRAY, JACK	615483	22:22	20:42	24:29			24:29
8	HARDCASTLE, RICHARD	847	21:47	22:46	7:50	23:24		23:24
9	SOVA, TOM	473169	19:50	23:18	22:34	22:28		23:18
10	GARDNER, STEVE	6193	23:06	22:41	23:12	22:34		23:12
11	ROMASH, ROBERT	130061	22:01	23:02	19:53			23:02
12	TELLIER, FRED	645957	22:51	21:22	4:16	17:29	3:58	22:51
13	VAN GORDER,WALTER	19912	20:29	21:10	19:04	22:45	:40	22:45
14	SLUSARCZYK, CHUCK		22:30	10:00				22:30
15	RAYMOND-JONES, D.C.	645958	20:31	18:22	22:02	19:41	21:23	22:02
16	GRANT, JIM		5:13	18:31	17:32	20:41	20:43	20:43
17	OBARSKI, R.W.	560	16:09	6:24	19:29			19:29
18	O'GRADY, DAN	614475	16:53	7:13	19:05	11:12	6:39	19:05
19	SINGER, LEN	209081	16:13	16:35	18:43			18:43
20	WHITTLES, JOHN	4400	14:50	18:09	12:14	3:21		18:09
21	BARBER. DOUG	56270	14:12	16:29	17:29	18:05		18:05
22	HACKER, VERNON	L304	9:11	17:30	16:47	14:37		17:30
23	DOWNS, F.S.	2209	11:52	16:56				16:56
24	WISNIEWSKI, GORDON	716	16:48					16:48
25	CAWTHORNE, JOHN	560561	14:59	2:58	14:26	16:25	8:57	16:25
26	ZUFELT, JAMES	615152	5:37	15:39	16:24			16:24
27	BARKER, JOHN	2095	15:05	15:01	13:01	13:34	15:55	15:55
28	CROSBY, DON		14:20	8:52	8:36	15:02	13:32	15:02
29	ARONSTEIN, DAVID		11:17	14:22				14:22
30	ITALIANO, A.J.	2386	1:04	11:34	8:21			11:34
31	KEHR, JOE	549294	8:09	11:06				11:06
32	CHAMPINE, ROBERT		8:20	8:06	9:41	10:20	10:57	10:57
33	VAN DOVER, ABRAM	894	6:42	10:41	7:05	3:09	9:10	10:41
34	OLSHEFSKY, PETER	614476	8:57	7:22				8:57
PLACE	CONTESTANT	AMA NO.	FLT 1	FLT 2	FLT 3	FLT 4	FLT 5	BEST FLIGHT
35	WRZOS, CHESTER	20454	7:57	3:20				7:57
36	LEIFER, LOUIS	646263	5:38	6:06				6:06
	BAUGHMAN, GARY	4147						
	CHILTON, STAN	L30						
	CLEM, JIM	L55						
	FELLIN, JOHN	95353						
	VALLEE, THOMAS	1126						

USIC 1999 ORNITHOPTER #210 FINAL SCORES

PLACE	CONTESTANT	AMA NO.	FLT 1	FLT 2	FLT 3	FLT 4	FLT 5	BEST FLIGHT
1	Coslick, Lawrence		13:57					13:57
2	Thomas, Mike	615041	11:10	12:40				12:40
3	Diebolt, John		6:59	7:19				7:19

PLACE	CONTESTANT	AMA NO.	FLT 1	FLT 2	FLT 3	FLT 4	FLT 5	BEST FLT
1	O'Grady, Dan	614475	17:54	9:56	17:51	18:22		18:22
2	Hartman, Phillip	8667	14:25	16:54	18:20	16:18	4:15	18:20
3	Olshefsky, Peter	614476	15:21	17:39	14:08	15:48		17:39
4	Thomas, Mike	615041	15:36	15:48	12:26	15:22	16:57	16:57
5	Tellier, Fred	645957	14:12	14:13	16:29	14:46	14:21	16:29
6	Wisniewski, Gordon	716	16:26	15:23	15:58	14:52	16:15	16:26
7	Clem, Jim	L55	14:52	13:45				14:52
8	Grant, John		6:84	14:50				14:50
9	Whittles, John	4400	12:00	14:18	14:31			14:31
10	Hardcastle, Richard	847	9:46	14:07				14:07
11	Kagan, John	469254	13:32	12:01	12:42			13:32
12	Romash, Robert	130061	13:10	12:46	12:10	12:29	11:25	13:10
13	Kirby, Noel C.	267885	7:27	13:06				13:06
14	Sova, Tom	473169	12:38	5:27	12:04			12:38
15	Raymond-Jones, D.C.	13157	10:12	11:21	12:10	12:22		12:22
16	Cawthorne, John	560561	11:49	12:11	12:08			12:11
17	Johnson, T.E.	16707	8:58	0:06	11:52	11:27		11:52
18	Rash, Fred	63458	8:44	11:00	11:37			11:37
19	Italiano, A.J.	2386	7:19	7:29	9:24	8:58	11:31	11:31
20	Boyd, Michelle	615267	6:30	5:25	10:10	11:01	9:34	11:01

PLACE	CONTESTANT	AMA NO.	FLT 1	FLT 2	FLT 3	FLT 4	FLT 5	BEST FLT
21	Sullivan, Edward	69585	10:08	10:48	9:53	10:56		10:56
22	Kent, Michael	614477	2:56	9:44	9:57	10:49	9:39	10:49
23	Vallee, Thomas	1126	7:11	10:26	9:24	4:58	0:34	10:26
24	Slusarczyk, Charles	2643	12:46	10:20				12:46
25	Conner, Marcus	615258	9:27	9:29				9:29
26	Landrum, Billie	52674	8:41	9:03	9:28			9:28
27	Kehr, Joe D.	549294	7:34	9:12				9:12
28	Stevens, Robert	615257	8:25	8:43	8:59			8:59
29	Van Dover, Abram	894	8:11	4:55	2:29			8:11
30	Nuszer, Joseph	29036	8:07					8:07
31	Hacker, Vernon	L304	7:04	7:35	5:16			7:35
32	Barber, Doug	56270	6:05	7:32	5:01			7:32
33	Wrzos, Chester	20454	6:47	7:10				7:10
34	Spradling, Nikki	615265	3:22	5:56	5:23	6:42	7:00	7:00
35	Victory, Stephanie	615264	5:46	4:46	3:33			5:46
36	Anderson, Patrick	61520	5:30	4:57	4:17			5:30
37	Cawthorne, John, Jr.	560562	2:04					2:04

PLACE	CONTESTANT	AMA NO.	FLT 1	FLT 2	FLT 3	FLT 4	FLT 5	BEST FLT
1	Gardner, Steve		5:06	5:58	14:18	16:34		16:34
2	Cailliau, Lawrence	79985	16:12	15:03				16:12
3	Van Gorder, Walt	19912	14:35	15:30				15:30
4	Thomas, Mike	615041	13:06	13:42	14:02	15:22		15:22
5	McGillivray, Jack	615483	12:21	14:25	14:56	15:06	15:11	15:11
6	Romash, Robert	130061	14:35	12:10	14:03			14:35
7	Cawthorne, John, Sr.	560561	13:17	12;50	13:08	2:06	14:27	14:27
8	Coslick, Larry	4652	10:38	13:51	13:28	11:54	14:21	14:21
9	Olshefsky, Peter	614476	13:12	9:11	10:35	13:55		13:55
10	Wisniewski, Gordon	716	10:35	12:54	13:16	13:16	13:44	13:44
	Marett, John	616261	13:21	11:13	10:46	13:31	12:32	13:31
	Grant, James		8:51	10:46	13:31	10:18	12:20	13:31
	O'Grady, Dan	614475	13:25	13:21	13:17			13:25
	Hartman, Phillip	8667	12:52	13:22	11:46	12:38	4:44	13:22
	Hardcastle, Richard	847	12:16	12:12	12:42	13:20		13:20
	Whittles, John	4400	11:00	13:18	11:09			13:18
	Miller, Richard	179518	6:50	12:36	13:10	3:34		13:10
	Sova, Tom	473169	11:16	12:49				12:49
	Cawthorne, John, Jr.	560562	12:39	11:22	12:18			12:39
	Koptonak, John	58027	12:20	12:35	12:03	12:28	12:37	12:37
	Barker, John	2095	9:18	12:34	11:51	11:21		12:34
	Ganser, Ronald	7532	11:50	12:33	6:08			12:33
	Tellier, Fred	645957	12:30	2:30	10:55	11:24	12:09	12:30
	Clem, Jim	L55	9:23	10:50	7:18	11:05	12:30	12:30
	Kent, Michael	614477	10:07	11:52	11:56	12:29		12:29
	Raymond-Jones, D.	645958	10:50	10:07	12:13			12:13
	Obarski, R W	560	11:15	12:08	11:49	9:22	11:58	12:08
	Johnson, T.E.	16707	10:34	10:02	9:55	11:55		11:55
	Crosby, Don		10:54	10:31	11:19	11:47	11:53	11:53
	Sullivan, Edward	69585	8:24	10:15	11:40	9:58		11:40
	Fellin, John	95353	10:11	11:31	11:22	11:32	5:02	11:32
	Tenny, Bub		11:04	10:39	10:02	11:26		11:26
	Singer, Len	209081	10:23	11:26				11:26
	Champine, Bob		8:25	11:23				11:23
	Italiano, A.J.	2386	2:21	4:02	9:23	10:43	11:22	11:22
	Boone, Jack L.	107857	10:48	8:29	9:52	11:11	10:43	11:11
	Gowen, William		10:53	9:35	:57			10:53
	Vonasek, Holly	529113	9:24	10:32	10:47			10:47
	Kehr, Joe D.	549294	10:40					10:40
	Zufelt, James	615152	9:53	10:00	8:50	8:39	10:16	10:16

USIC 1999 LTD. PENNYPLANE #208 - FINAL SCORES

PLACE	CONTESTANT	AMA NO.	FLT 1	FLT 2	FLT 3	FLT 4	FLT 5	BEST FLT
	Person, Lee	383504	9:13	10:12				10:12
	Landrum, Billie	52674	9:55					9:55
	Gowen, John		9:31	9:04	9:13			9:31
	Barber, Doug		7:48	7:27	6:33	8:52		8:52
	Hacker, Vernon	L304	6:21	7:50	8:09			8:09
	Kelly, James B.	37564	7:38	6:43				7:38
	Kirby, Noel C.	267885	5:50					5:50

USIC 1999 INTERMEDIATE STICK #202

1	Slosarczyk, Don		34:05	10:43	38:12			38:12
2	Kagan, John		35:39					35:39
3	Coslick, Larry	4652	28:47	34:44	31:51			34:44
4	Hunt, Bernard	618510	5:33	32:08	31:59	33:59		33:59
5	Tellier, Fred	645957	27:34	27:40	32:35			32:35
6	Thomas, Mike	615041	23:15	32:29				32:29
7	McGillivray, Jack	615483	30:19	29:03	25:57	26:42		30:19
8	Hardcastle, Richard	847	27:51	29:50	24:30	17:30		29:50
9	Sova, Tom	473169	29:34	23:25				29:34
10	Grant, Jim		7:39	19:03	26:23			26:23
11	Vallee, Thomas	1126	17:33	23:42	3:47			23:42
12	Oishefsky, Peter	614476	12:01	22:18	1:34	7:55	19:40	22:18
13	Downs, F.S.	2209	20:42	15:30				20:42
14	Romash, Robert	130061	16:50	19:46	14:25			19:46
15	Barker, John	2095	7:56	11:46	18:30			18:30
16	Ganser, Ronald	7532	18:22					18:22
17	Whittles, John	4400	17:53	17:51	17:45			17:53
19	Raymond-Jones, D.C.	645958	15:44					15:44
19	Kehr, Joe	549294	7:36	8:15	10:02	2:26		10:02
20	O'Grady, Dan	614475	4:38					4:38
21	Baughman, Gary	4147						DNF

SCORING: BEST SINGLE FLT OF 5 FLTS. 1 DELAYED FLIGHT OF LESS THAN 60 SECONDS ALLOWED FOR EACH OF 5 FLIGHTS.

USIC 1999 HL GLIDER #212 FINAL SCORES

PLACE	CONTESTANT	AMA NO.	FL 1	FL 2	FL 3	FL 4	FL 5	FL 6	FL 7	FL 8	FL 9	BEST FLT	2ND BEST FLT	TOTAL TWO BEST FLTS.
1	Boehm, Bernard	92567	63.8	63.8	60.1	65.3	66.2	66.1	67.3	71.1	67.7	71.1	67.7	138.8
2	Buxton, Jim	75154	66.5	67.3	64.2	59.8	61.4	68.9	63.7	64.8	69.5	69.5	68.9	138.4
3	Romash, Robert	130061	62.3	58.9	63.7	62.8	60.1	60.1	26.8	44.3	42.4	63.7	62.8	126.5
4	Whittles, John	4400	45.0	53.1	52.2	51	51	22.4	57.5	5.2	7.2	57.5	53.1	110.6
5	Jessup, Artie	10269	29.0	35.9	42.5	44.6	35	43.2	45.1	42.5	46	46	45.1	91.1
	Crawford, Dohrman	601965												DNF

USIC 1999 KIT PLAN SCALE #213 - FINAL SCORES

PLACE	CONTESTANT	AMA NO.	SUBJECT	FIDEL. PTS.	WORK-MANSHIP	TOTAL
1	Thomas, Mike	615041	Miles Sparrowhawk	58	39	97
2	Grant, Jim	159477	Grasshopper	59	38	97
3	MacEntee, Richard	102085	Daphne	59	38	97
4	Blair, John	29698	Taylor Cub	54.5	39	93.5
5	Miller, Richard	179518	DGA9	56	36	92
	Cawthorne, John	560562				DNF
	#213 Kit Plan Scale Scoring: 2 attempts for each of 5 official flights.					
	Flight time in seconds, cannot exceed total scale points. Score					
	will be sum of best two flights plus static score.					

USIC 1999 ROG STICK #214 FINAL SCORES

PLACE	CONTESTANT	AMA NO.	FLT 1	FLT 2	FLT 3	FLT 4	FLT 5	BEST FLIGHT
1	Coslick, Lawrence	4652	15:49	16:09	18:55	19:09		19:09
2	Sova, Tom	473169	12:54	16:03	18:29			18:29
3	Loucka, Larry	1210	18:26					18:26
4	Thomas, Mike	615041	16:27					16:27
5	Kehr, Joe	549294	10:09	3:08				10:09
6	Tellier, Fred	645957	8:29	9:29	9:28			9:29
7	Chilton, Stan	L30						DNF
8	Raymond-Jones, D.C.	645958						DNF

USIC 1999 BOSTONIAN #215 - FINAL SCORES

PLACE	CONTESTANT	AMA NO.	FLT 1	FLT 2	FLT 3	FLT 4	FLT 5	BEST 2 FLTS	CHARISMA	TOTAL
1	Coslick, Larry	4652	5:34	5:56	6:18			12:14	1.2	14:45
2	Thomas, Mike	615041	5:44	5:04	6:09			11:53	1.15	13:40
3	Schutzel, Emil	508384	5:13	4:40	4:45			9:58	1.18	11:46
4	Marett, John	616261	4:18	4:09	4:40	4:32		9:12	1.07	9:56
5	Grant, Jim		4:37	4:22				8:59	1.08	9:42
6	Barker, John	2095	4:27	3:44	2:27	4:07	4:15	8:42	1.08	9:23
7	Miller, Richard	179518	3:20	4:18	0:00			7:38	1.09	8:19
8	Kent, Michael	614477	3:22	2:45	3:16	3:27	3:00	6:49	1.1	7:30
9	Cawthorne, John	560561	2:57	3:06	3:14	2:36	3:26	6:40	1.11	7:24
10	Gardner, Steve		2:29	2:07	2:24	1:44		4:53	1.19	5:49
11	Aronstein, David		4:12		0:00			4:12	1.12	4:42
12	Rash, Fred	63458	1:57	2:20	1:55			4:17	1.08	4:38
13	Wieczorek, Leon.	10105	1:57	2:01	1:56			3:58	1.09	4:19
14	Anderson, Patrick	615260	1:56	1:48				3:44	1.04	3:53
15	MacEntee, Richard	102085							1.06	
	Nuszer, Joseph	29036	0:25					0:25	1.11	0:28

USIC 1999 FAC PEANUT SCALE - SCORING: BEST SINGLE FLIGHT OF 3 FLTS

PLACE	CONTESTANT	PLANE	SCALE POINTS	BONUS	FLT 1	FLT 2	FLT 3
1	Buxton, Jim	P51A	56	10	122		
2	Miller, Richard	Volks Plane	49.5	10	117	113	
3	Lee, Jim	Lacy	56	O	113	112	104
4	MacEntee, Richard	Portier 100 T5	54	O			
5	Munez, George	P51A	53.5	10	40	41	65
6	O'Dell, Bill	Davis	46	10	34	17	39
7	Anderson, Patrick		45	10	31	24	27
	MacEntee, Richard	Linberger	52	15	80	67	

USIC 1999 COCONUT SCALE (MIAMI) - FINAL SCORES

PLACE	CONTESTANT	PLANE	RANK (SCALE)	BEST TIME	RANK (TIME)
1	ARONSTEIN, DAVID	ANT-25	1.75	4:49	2.75
2	BOYD, MICHELLE	Gen Artstocrat	1.5	2:35	3.5
3	ANDERSON, KENNETH	Curtiss CW-15 Air	1.25	2:29	4.25
4	NUNEZ, GEORGE	Potez 63	1.5	2:04	6.5
5	MAC ENTEE, RICHARD	Pilatus Porter	2.5	2:22	6.5
6	LINSTRUM, DAVID	M208 Luftkahsa	2.5	1:45	8.5
7 (TIE)	KOPTONAK, JOHN	Curtiss Robin	2.5	1:36	9.5
7 (TIE)	LAVENDER, TIM	Vervelle Aircoach	2.5	DNF	
DNF	LANDRUM, BILLIE	Not submitted by 12:00			
DNF	CONNER, MARCUS	? Flyabout	5.5		
DNF	CONNER, MATTHEW	Not submitted by 12:00			
DNF	SMITH, JENNIFER	Lincoln	4		
DNF	STEVENS, ROBERT	Farman Moustique	4		
DNF	VICTORY, STEPHANIE	Brista Brownie	6.5		
DNF	MILLER, RICHARD	Zlinz- 317	3		

USIC 1999 STD CLASS CAT GLR. #218 Scoring: Total of best 2 of 9 flts, timed to .1 sec (round down)

PLACE	CONTESTANT	AMA NO.	FL 1	FL 2	FL 3	FL 4	FL 5	FL 6	FL 7	FL 8	FL 9	BEST FLT	2ND BEST FLT	TOTAL TWO BEST FLTS.
1	Schlarb , Ralph	322352	78.8	79.5	61	78.8	20	45	61.3	78.2	66	79.5	78.8	158.3
2	Schlarb, W. L.	14425	65	70.2	68.5	74.2	73.1					74.2	73.1	147.3
3	Romash, Robert	130061	72.5	74.3	68.9	62.8	62.1	65.2	72.1	70.6	70.6	74.3	72.5	146.8
4	Marett, John	616261	2.8	61.1	69.5	59.4	74.9	47.9	68	68.5	69.7	74.9	69.7	144.6
5	Johnson, T.E.	16707	50.1	65.3	65.8	69.8	70.3	53.5	65.7	66.5	64.6	70.3	69.8	140.1
6	Person, Lee	383504	68.4	69	17.1	61.4	69.8	63.7				69.8	69	138.8
7	Jessup, Artie	10269	66	68.4	65.3	65.3	66.9	12.6	64.9	21.6	33.7	68.4	66.9	135.3
8	Koptonak, John	58027	58.9	53.4	56.6	55.8	60.3	61.8	64.9	65.2	64.5	65.2	64.9	130.1
9	Vonasek, Holly	529113	52.9	51.2	13.4	66.8	63.2	54.1	57.6	61.9	61.8	66.8	63.2	130
10	Miller, Richard	179518	54	51	60.5	57.5	51.6	49.9	47.1	39.4		60.5	57.5	118
11	Kelly, James R.	37564	44.2	47.7	65.5	52.4						65.5	52.4	117.9
12	Nishanian, Peter	589485	58	57.1	41.3	57.4	49.7	57.7				58	57.7	115.7
13	Crawford, Dohrm	601965	56.1	52.6	46.2	56.7	51.9	54.9	50.5	51.7	51.1	56.7	56.1	112.8
14	Krempetz, Kurt	69866	55.1	49.5	50.5	55.5	5.3	36.2	18.9	10		55.5	55.1	110.6
15	Krempetz, Kenne	11951	50.2	57.9	50	38.2	37.5	45.1				57.9	50.2	108.1
16	Van Dover, Abra	894	40	45	55.8	45	21.5	25.8	43.7	47.4	50	55.8	50	105.8
17	Whittles, John	4400	53.9	49.9	7.1	43.3	42.1	45	45			53.9	49.9	103.8
18	Champine, Bob	5160	46	45	27	39.9	40.3	25.9	43.8	44.8	40.4	46	45	91
19	Krempetz, Kenny	559200	35.8	38.7	3.6	39.8	27.5	12				39.8	38.7	78.5
20	Vallee, Thomas	1126	29.6	26.9	33.5	34.4	32.6	34.7	37.1	36.8		37.1	38.8	73.9
	Baughman, Gary	4147												DNF

USIC 1999 UNLIMITED CAT GLIDER #219 - FINAL SCORES

PLACE	CONTESTANT	AMA NO.	FLT 1	FLT 2	FLT 3	FLT 4	FLT 5	FLT 6	FLT 7	FLT 8	FLT 9	BEST FLT	2ND BEST FLT	TOTAL 2 BEST FLTS.
1	Boehm, Bernard	92567	78.5	79.2	80.2							80.2	79.2	159.4
2	Schlarb, Ralph	322352	77.5	79.2	76.5	73	73	75				79.2	77.5	156.7
3	Schlarb,. W. L.	14425	67.1	66.3	69.5	71.2	75.8	75.2	71.0	75.3		75.8	75.3	151.1
4	Marett, John	616261	72.8	33.5	36.1	66.5	72.8	66.8	56.1	57	75.6	75.6	72.8	148.4
5	Johnson, T.E.	16707	74.3	60.2	62.7	63.4	64.9	72.4	16.5	64.9	65.3	74.3	72.4	146.7
6	Romash, Robert	130061	70.5	72.6	70.1	70.1	65.8	67.5	70.3	67.5	73.3	73.3	72.6	145.9
7	Buxton, Jim	75154	71	69.6	67.6	72.1			70.3			72.1	71	143.1
8	Person, Lee	383504	72.8	62.5	69.2	65.3	57.8	69.6	70.3			72.8	69.6	142.4
9	Nishanian, Peter	589485	67	66	65	58.4	62.3	22.1	68.5	70.2	72	72	70.2	142.2
10	Jessup, Artie	10269	35.5	51.6	66.5	64.3	65.5	67.5	58.2	58.3	53.3	67.5	66.5	134
11	Krempetz, Kenne	11951	49.8	54.3	58.2	60	62.1	62	61.5	58.5	70.1	70.1	62.1	132.2
12	Krempetz, Kurt	69866	5.4	53	51.8	53.1	51	47.5	58.5	57	64.2	64.2	58.5	122.7
13	Van Dover, Abrar	894	44.4	46.6	46	49.5	41.1	3.1	40.4	49.5	52.1	52.1	49.5	101.6
14	Champine, John	5160	45.8	28.3	37.2	27.1	33.8	51.7	45.4	45.8	7.1	51.7	45.8	97.5
15	Crawford, Dohrm	601965	50.1	38.3	42.2	39.9	40.6	37.6				50.1	42.2	92.3
16	Krempetz, Kenny	559200	13.9	37.5	7	44.5	44.3	39.5				44.5	44.3	88.8
	Baughman, Gary	4147												DNF

USIC 1999 MINI STICK #220 - FINAL SCORES

PLACE	CONTESTANT	AMA NO.	FLIGHT 1	FLT 2	FLT 3	FLT 4	FLT 5	BEST FLT
1	Cailliau, Larry	79985	12:32					12:32
2	Hunt, Bernard	618510	10:29	11:43	12:12	11:25		12:12
3	Koptonak, John	58027	11:45	10:28	10:48	11:48	11:57	11:57
4	Van Gorder, Walt	19912	11:17	11:56				11:56
5	Slusarczyk, Don		9:59	11:08	8:24	11:41		11:41
6	Tellier, Robert	645957	8:56	11:02	10:56	11:13		11:13
7	Barker, John	2095	7:57	7:49	7:36	9:35	11:02	11:02
8	Romash, Robert	130061					11:02	11:02
9	Thomas, Mike	615041	10:49	10:47	11;00			11;00
10	Sova, Tom	473169	10:08	10:58	10:11	10:30		10:58
11	Singer, Len	209081	8:53	9:02	10:25			10:25
12	Slusarczyk, C.		9:20	10:18				10:18
13	Diebolt, John		8:14	8:35	10:16	9:13		10:16
14	Schutzel, Emil	508384	8:04	10:11	8:26			10:11
15	Grant, Jim		8:17	9:11	9:57	8:43		9:57
16	Obarski, R.W.	560	9:12	7:10	7:23	4:06	7:02	9:12
17	Kehr, Joe	549294	8:57	8:39	8:51	8:06	8:08	8:57
18	Clem, Jim	L55	4:26	8:56	8:54			8:56
19	Crosby, D.		6:23	8:49	8:47			8:49
20	Olshefsky, Peter	614476	8:38	5:44	7:53	8:36	7:04	8:38
21	Raymond-Jones, D.	645958	7:03	7:22	8:33			8:33
22	O'Grady, Dan	614475	8:12	3:43				8:12
23	Whittles, John	4400	7:39	7:40				7:40

USIC 1999 MINI STICK #220 - FINAL SCORES

PLACE	CONTESTANT	AMA NO.	FLIGHT 1	FLT 2	FLT 3	FLT 4	FLT 5	BEST FLT
24	Person, Lee	383504	6:55	6:42	6:34		7:23	7:23
25	Kelly, James	37564	6:09	6:14	6:50	4:41		6:50
26	Cawthorne, John, Sr.	560561	4:55	6:24				6:24
27	Hacker, Vernon	L304	5:52					5:52
28	O'Dell, W.		5:09	2:17				5:09
29	Champine, R.		4:10					4:10
30	Downs, Sandy	2209	4:08					4:08

USIC 1999 FIL (INT'L EZ-B 1.2 GM) - FINAL SCORES

PLACE	CONTESTANT	FLIGHT 1	FLIGHT 2	FLIGHT 3	FLIGHT 4	FLIGHT 5	FLIGHT 6	TOTAL OF BEST 2 OF 6 FLIGHTS
1	Hunt, Bernard	19:50	20:03	20:53	19:04			40:56
2	Loucka, Larry	18:30	19:28	19:31	17:20			38:59
3	Grant, Jim	18:13	19:01	19:22	19:12			38:23
4	Tellier, Fred	17:17	18:21	18:23	19:29			37:52
5	Coslick, Larry	18:43	4:32	15:23	18:48			37:31
6	Slusarczyk, Don	16:25	20:05	15:30	7:23			36:30
7	Romash, Robert	16:27	16:15	16:40	15:27			33:07
8	Singer, Len	15:32	17:16					32:48
9	Vonasek, Holly	13:07	14:59	16:57	15:37			32:34
10	Cawthorne, John	15:26	6:51	14:00	14:44			30:10
11	Wrzos, Chester	6:55	14:21	15:01				29:22
12	Raymond-Jones, D.	ATT	7:15	12:51	13:08			25:59
13	Whittles, John	11:31	11:37	9:58	14:07			25:44
14	Hacker, Vernon	8:45	13:06	5:41	12:24			25:30
15	Landrum, Billie	12:17	13:13	5:20				25:30
16	Kagan, John	5:36	15:33					21:09
17	Rash, Fred	8:51	ATT	12:03				20:54
18	Koptonak, John	13:14	7:11					20:25
19	Kehr, Joe	15:18	:42	3:37	3:37			18:55
20	Van Dover, Abram			11:06	6:34			17:40
21	Crosby, D.	ATT	12:22	3:51				16:13
	Cailliau, Larry							DNF

USIC 1999 INTERNATIONAL EZ-B (AMA RULES) FINAL SCORES

PLACE	CONTESTANT	AMA NO.	FLIGHT 1	FLIGHT 2	FLIGHT 3	FLIGHT 4	FLIGHT 5	SCORE
1	Cailliau, Larry	79985	31:14	30:09				61:23
2	Sova, Tom		19:10	24:25	20:12	21:59		46:24
3	Hardcastle, Richard	847	22:22	23:55				46:17

USIC 1999 PIONEER SCORING: BEST SINGLE FLIGHT OF 3 FLIGHTS

PLACE	CONTESTANT	PLANE	SC PT.	BONUS	FLT 1	FLT 2	FLT 3	TOTAL OF BEST TIME + SC + BONUS
1	THOMAS, MIKE	1911 Voisin Hydro	x	30	107	127		157
2	GANSER, RON	1511 Cessna	X	5	128.1	143.63		148
3	SCHUTZEL, EMIL	Santos-Dumas	X	25	121	115	114	146
	LAVENDER, TIM	Drzewiecki	x	15	74	87		102
5	MAC ENTEE, RICHARD	Voisin Hydro	x	30	71	45		101
6	ANDERSON, KENNETH	Eastbourne	X	5	21	-45		26
	LEE, JIM					45		DNF
	OLESON, DOUG					-45		DNF
						45		
			FINAL SCORES			-45		

USIC 1999 MODERN CIVIL PRODUCTION (45 PTS. MIN TO FLY) FINAL SCORES

PLACE	CONTESTANT	PLANE	SC PT.	BONUS	FLT 1	FLT 2	FLT 3	TOTAL OF BEST TIME + SC + BONUS
1	McGillivray, Jack	Piper J5B	X	O	264			264
2	Brownhill, Chris	Piper Pacer	X	O	155	168	155	168
3	MacEntee, Richard	Pilatus	X	O	93	94	100	100
4	Nunez, George	Turbo Beaver	X	O	67	87		87
5	Landrum, Billie	Found Cen.	X	O	23	29		29
	Lavendar, Tim	Ord-Hume	X	O				
	Anderson, Kenneth							DNF

USIC 1999 - GOLDEN AGE - FINAL SCORES

PLACE	CONTESTANT	PLANE	SC PT.	BONUS	FLT 1	FLT 2	FLT 3	TOTAL OF BEST TIME + SC + BONUS
1	Thomas, Mike	Piper	X	O	212	231	233	233
2	Miller, Richard	Piper	X	O	156	189	207	207
3	MacEntee, Richard			10	141	140	153	163
4 (tie)	Anderson, Ken		X	O	150			150
4 (tie)	Boyd, Michelle	General Aris.	X	O	150	131	51	150
	Lee, Jim	Taylorcraft	X	O	135	144	137	144
	Smith, Jennifer	Lincoln AP	X	O	133	133	139	139
	Brownhill, Chris	Curtiss Robin	X	O	115	128	121	128
	Blair, John	Beech Staggerw	X	15	73	83	90	105
	Koptonak, John	Fairchild	X	O	86	90	104	104
	Nunez, Geo.	Fairchild	X	O	98	96	100	100
	McLellon, Bob		X	10	39	38	40	50
	Lavender, Tim	Verville	X	O				
	McGillivray, Jack	DeHavilland Moth Minor	X	10				

USIC 1999 F1DB - FINAL SCORES

	CONTESTANT	FLIGHT 1	FLIGHT 2	FLIGHT 3	FLIGHT 4	FLIGHT 5	FLIGHT 6	BEST 2 OF 6
1	Hunt, Bernard	17:40	19:39					19:39
2	Kehr, Joe	13:36	14:13	15:58	14:02	14:19		15:58
3	Rash, Fred	12:17	13:39	14:25	13:23			14:25
4	Tellier, Fred	13:37	:20	13:16	12:25			13:37
5	Landrum, Billie	13:23						13:23
6	Vallee, Thomas	9:54	10:47	1:26	11:34	12:25		12:25
7	Raymond-Jones, D.	4:01	7:29					7:29
	Clem, Jim							DNF
	Diebolt, John							DNF
	Downs, Sandy							DNF
	Kirby, Noel							DNF
	O'Grady, Dan							DNF
	Olshefsky, Peter							DNF
	Van Dover, Abram							DNF
	Wrzos, Chester							DNF
		Scoring: Total of best 2 of 6 flts.						
		1 delayed flt of less than 60 seconds						
		allowed for each of 6 official flights.						

USIC 1999 F.R.O.G. - FINAL SCORES

PLACE	CONTESTANT	AMA NO.	Flt 1	Flt 2	Flt 3	Flt 4	Flt 5	Best Flight
1	Diebolt, John		7:21	6:06	6:24	8:02		8:02
2	Sova, Tom	473169	7:18	7:50				7:50
3	Rash, Fred	63458	6:37	6:29	5:55	7:27		7:27
4	Clem, Jim	L-55	4:59	6:19				6:19
5	Champine, R.		3:32	4:06				4:06
	Smith, Phillip	345800						DNF
	Whittles, John							DNF

USIC 1999 FAC PEANUT SCALE - SCORING: BEST SINGLE FLIGHT OF 3 FLTS

PLACE	CONTESTANT	PLANE	SCALE POINTS	BONUS	FLT 1	FLT 2	FLT 3
1	Buxton, Jim	P51A	56	10	122		
2	Miller, Richard	Volks Plane	49.5	10	117	113	
3	Lee, Jim	Lacy	56	O	113	112	104
4	MacEntee, Richard	Portier 100 T5	54	O			
5	Munez, George	P51A	53.5	10	40	41	65
6	O'Dell, Bill	Davis	46	10	34	17	39
7	Anderson, Patrick		45	10	31	24	27
	MacEntee, Richard	Linberger	52	15	80	67	
	Schutzel, Emil						
	Thomas, Mike						
	Brownhill, Chris						

USIC 1999 PRO 20 FINAL SCORES

PLACE	CONTESTANT	FLIGHT 1	FLIGHT 2	FLIGHT 3	FLIGHT 4	FLIGHT 5	BEST FLIGHT
1	LOUCKA, LARRY	26:00	30:27				30:27
2	SOVA, TOM	22:43	25:15	26:39	23:02	11:04	26:39
3	WHITTLES, JOHN	ATTEMPT	ATTEMPT	14:21	14:33	16:35	16:35
	WRZOS, CHESTER						DNF

USIC 1999 UNLIMITED RUBBER SPEED

Scoring: Shortest time for 2 laps. Unlimited attempts.

PLACE	CONTESTANT	AMA NO.	FLT 1	FLT 2	FLT 3	FLT 4	FLT 5	BEST FLIGHT
1	COSLICK, LARRY	7:10	9:80	7:33	7:34	6:67	7:49	6:67
2	DIEBOLT, JOHN	10:10	10:60	9:50	9:10			9:10
3	ITALIANO, ANTHONY	16:62	12:94	11:20				11:20
	BIGGE, WILLIAM							DNF
	BLAIR, JOHN							PIERCED BALLOON
	HACKER, VERNON							DNF
	KELLY, JIM							DNF
	RAYMOND-JONES, D.C.							DNF
	ANDERSON, KEN							DNF

USIC 1999 LEGAL EAGLE

Scoring: Total of 3 highest flights of 9

	CONTESTANT	FLT.	FLT.	FLT.	SCORE
1	Schutzel, Emil	7:00	7:08	7:11	21:19
2	Obarski, Richard	6:02	6:15	6:05	18:22
3	Aronstein, David	5:28	5:44	5:50	17:02
4	Linstrum, David	2:39	3:10	3:20	9:09
	Bigge, William				DNF
	Diebolt, John				DNF
	MacEntee, Rich				DNF

USIC 1999 35 CM - FINAL SCORES

PLACE	CONTESTANT	AMA NO.	FLIGHT 1	FLIGHT 2	FLIGHT 3	FLIGHT 4	FLIGHT 5	BEST FLIGHT
1	SOVA, TOM	20:54	21:09					21:09
2	ROMASH, ROBERT	20:20	21:00	5:49				21:00
3	VALLEE, THOMAS	15:24	18:30	17:24	19:41	20:58		20:58
	GRANT, JAMES	17:35	19:31					19:31
	O'GRADY, DAN	13:55	14:58	18:22				18:22
	OLSHEFSKY, PETER	17:19						17:19
	WHITTLES, JOHN	11:59	9:35	13:22	16:17			16:17
	RAYMOND-JONES D.C.	9:58	11:45					11:45
	ZUFELT, JAMES	4:04						4:04
	BIGGE, WILLIAM							DNF
	FELLIN, JOHN							DNF
	LANDRUM, BILLIE							DNF
	NUSZER, JOSEPH							DNF
	Van Dover, Abram							DNF

USIC 1999 NO CAL - FINAL SCORES

PLACE	CONTESTANT	FLT 1	FLT 2	FLT 3	FLT 4	FLT 5	BEST FLIGHT
1	Thomas, Mike	6:50	7:20	6:40			7:20
2	Slusarczyk, C.	6:52	6:59	6:11	6:37	7:06	7:06
3	Loucka, Larry	6:49	5:59	7:01			7:01
4	Slusarczyk, D.	6:20	6:42	2:17			6:42
5	Obarski, Richard	6:21	6:27	2:26	5:16		6:27
6	Brownhill, Chris	4:46	3:46	4:33	4:51	4:28	4:51
	Rash, Fred	4:03					4:03
	Kehr, Joe	3:35	3:42	4:02			4:02
	Nuszer, Joseph	3:18					3:18
	Fellin, John	2:34	3:01	2:41			3:01
	Van Dover, Abram	2:12	2:28	2:56	ATT	2:45	2:56
	Person, Lee	2:22	1:44	2:24	2:40	2:20	2:40
	Anderson, Patrick	1:07	1:50	1:26	1:24	0:47	1:50
	Boone, Jack	1:40	1:28				1:40
	Diebolt, John	1:25					1:25
	Linstrum, David	0:34					0:34

USIC 1999 FAC SCALE - FINAL SCORES

PLACE	CONTESTANT	PLANE	SC PT.	BONUS	FLT 1	FLT 2	FLT 3	TOTAL OF BEST TIME + SC + BONUS
1	McGillivray, Jack	SE5	59	15	111	91	121	156.5
2	Miller, Richard	Currie WOT	59	20	98			151
3	Lee, Jim	Lacey	60	0	140	129	132	142.5
4	Brownhill, Chris	Lacey	59.5	0	119	114	118	142
5	Anderson, Ken	Blohm & Voss BV141B	52	20	68	75	71	139.5
6	Linstrum, David	Stout 2-AT	55.5	0	96	92	100	133
7	MacEntee, Richard	Farman 352	55.5	10	54			119.5
8	Nunez, George	NakaJimm A5 M2-N	53	15	26	36	37	105
9	O'Dell, Bill	Douglas Skyrader	53.5	10	25			88.5
10	Anderson, Wayne	ME109E	58.5	10				
12	O'Dell, Bill	Cessna Bird Dog	47	0				

USIC 1999 HIGH WING MONOPLANE- SCORING: BEST SINGLE FLT OF 3 FLTS.

PLACE	CONTESTANT	PLANE	SC PT.	BONUS	FLT 1	FLT 2	FLT 3	TOTAL OF BEST TIME + SC + BONUS
1	Koptonak, John	Lacy	x	O	130	136	150	150
2	Brownhill, Chris				149	143	133	149
3	Lee, Jim				107	106	108	108
4	Blair, John	Air Sport	x	O	59	48	0	59
5	MacEntee, Richard	Poitier	x	O		76	55	76
6	Nunez, George	Zippy	x	O	65	61		65

1999 USIC INDOOR MASS LAUNCH WINNERS

* WWI & WWII	JACK MC GILLIVRAY
COCONUT	DAVID ARONSTEIN
MINI STICK	BERNARD HUNT
* P-24	JIM CLEM
BOSTONIAN	JOHN MARETT

(*) Trophy Awarded