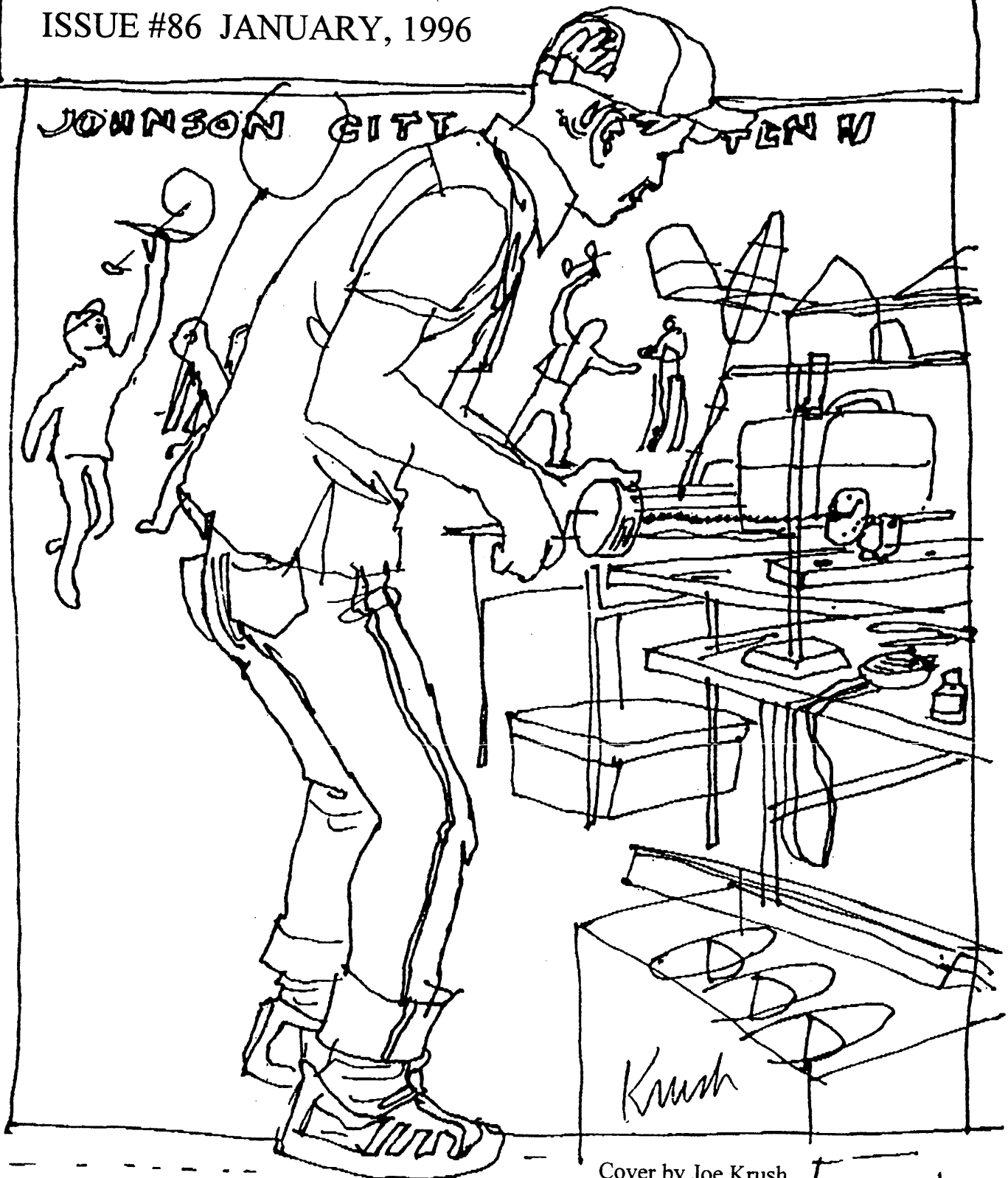


HAPPY NEW YEAR

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Cover by Joe Krush

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H PIET H@AOL.COM

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

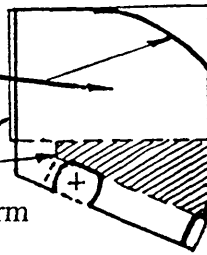
1. Adjusting the pressure on the rubber and holding it in place with the arm can be made easier, modifying the holding screw as a wing nut using a paper clip. Just bend a paper clip with round nose pliers, to look like a wing nut, of a size of about 1/2 inch wide and 1/4 inch high. Remove the screw and 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

Underneath insert even with arm
Slide: 3/4 x 1"



Source - Unknown

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)

TRUE TANDEM F1D by Bernard Hunt

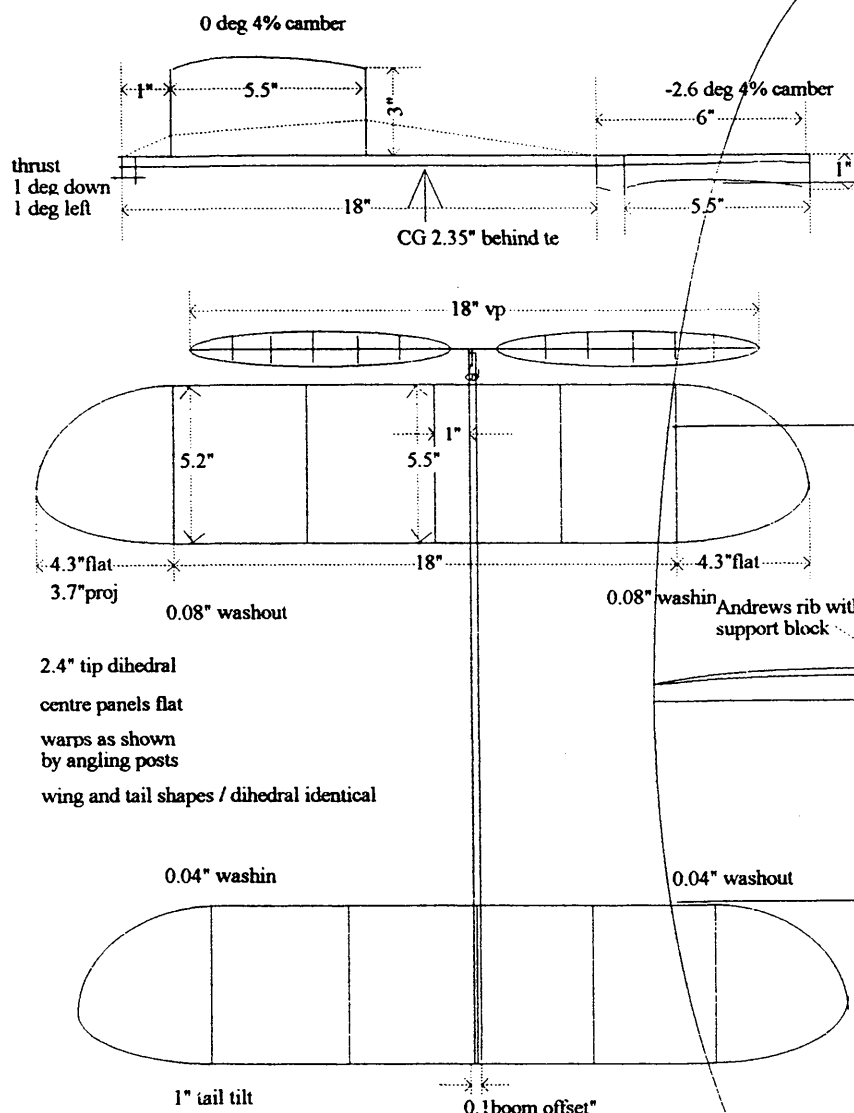
WINNER

(not to scale)

HAND LAUNCH STICK

JOHNSON CITY 1995

TIME 46 MIN 14 SEC



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
avirpm	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

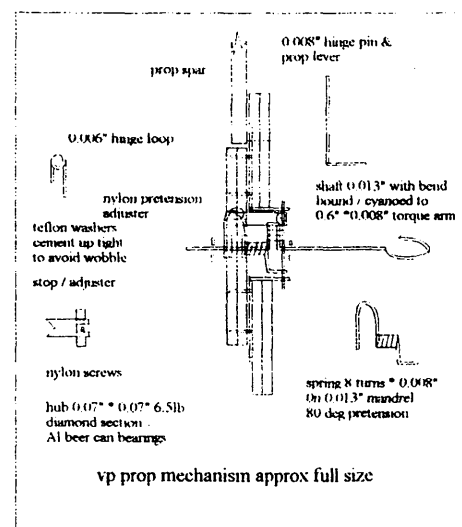
DESIGN and CONSTRUCTION

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.



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!

DOMEDUSTER PUBLICATIONS

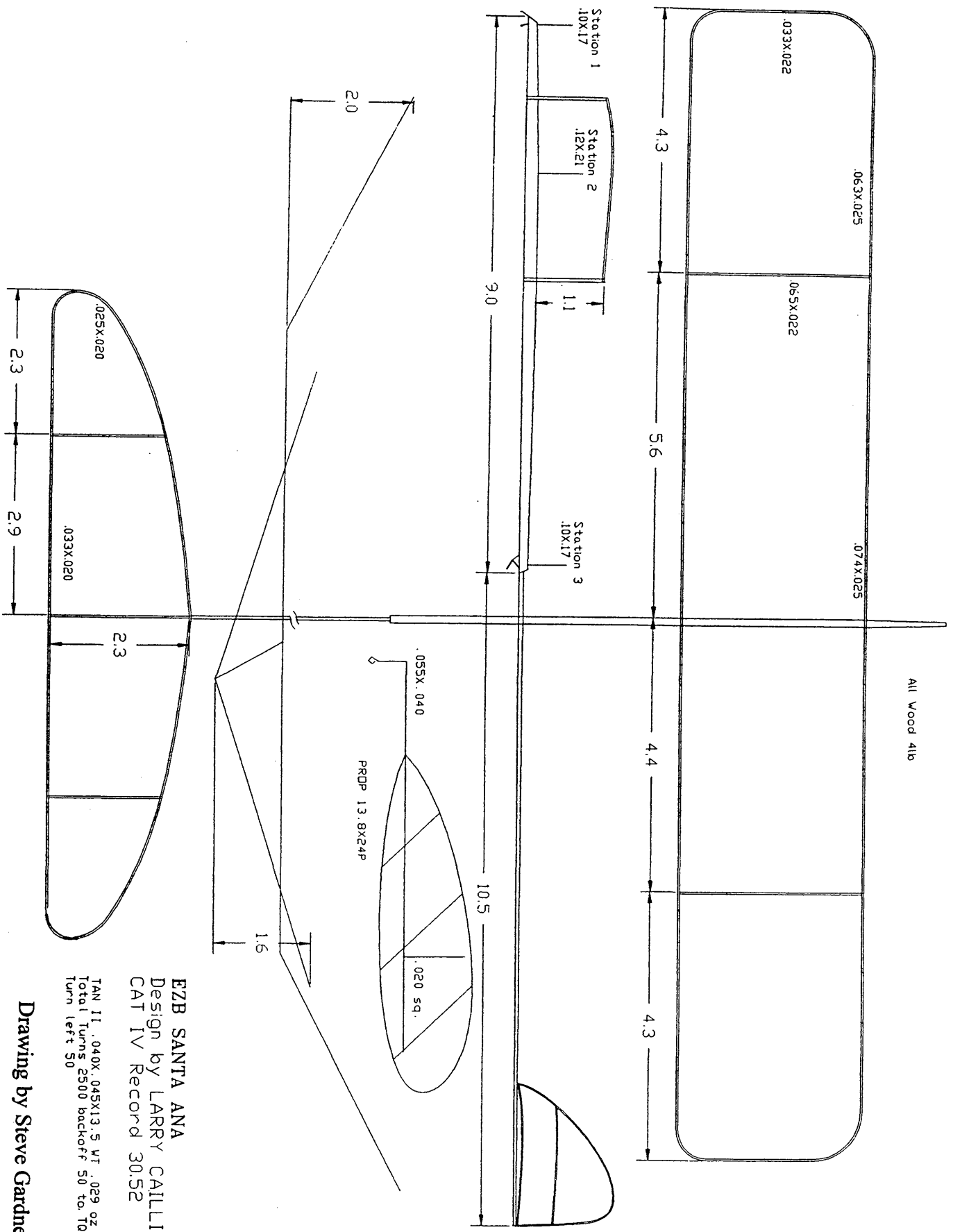
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Ask About Our New Plan Packet #6



EZB SANTA ANA
 Design by LARRY CAILLIALL
 CAT IV Record 30.52
 TAN 11.040X.045X13.5 WT. .029 oz
 Total Turns 2500 backoff 50 to. 10=2.0
 Turn left 50

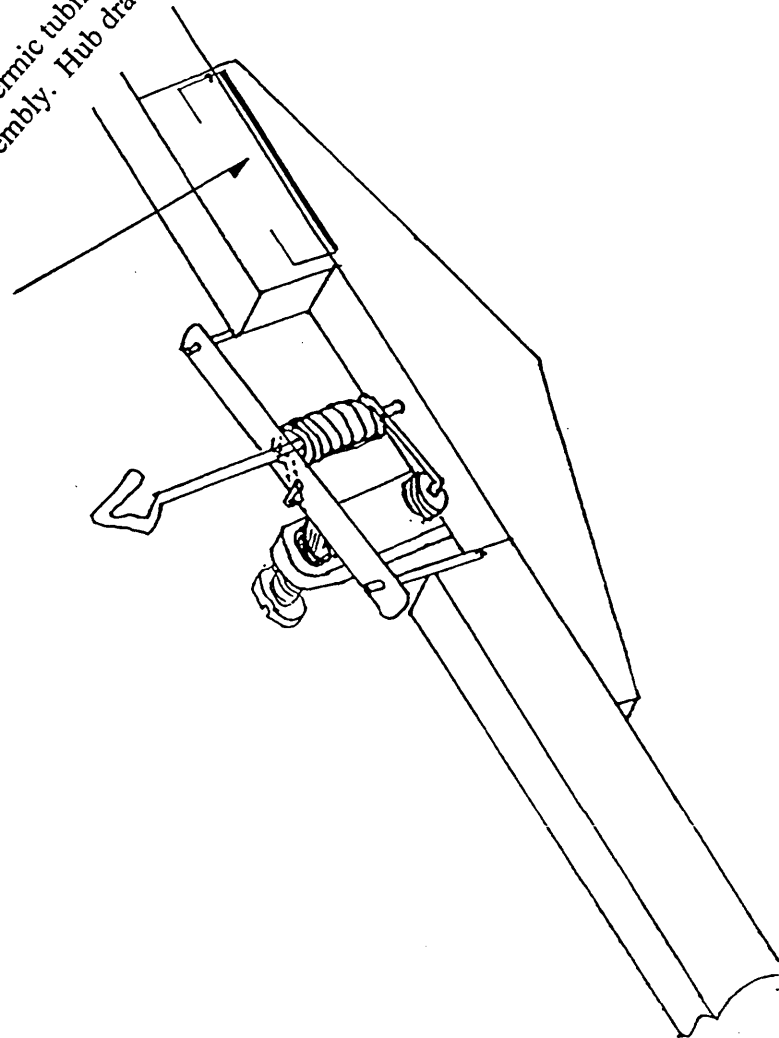
Drawing by Steve Gardner

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 1/4 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.

Hypodermic tubing & wire Hinge Assembly. Hub drawing from Steve Brown.



**SMALL
PARTS
INC.**

13980 N.W. 58th Court, P.O. Box 4650
Miami Lakes, FL 33014-0650
Tel. 1-800-220-4242
Fax: 1-800-423-9009

WEIGHTS (mg)

WING	220	WING DRV	135	WING COVERED	220
STICK	220				
PROB V/P	140				
SLAB	80	SLAB DRV	42	SLAB COVERED	15
TAILBOOM	80	TAILBOOM	10		
TOTAL	800				

MATERIALS & DIMENSIONS

MOTOR STICK
 FRONT WEB .011 3.15" .22 I.D.
 REAR WEB .011 3.15 LG 4.0"
 REAR FLUTE .011 3.15 LG 4.0"
 REAR FLUTE .20 O.D. x .188 LG 3.5"
 POST, Ø .050 7"
 MOUNT Ø .010 WIRE
 REAR FLUTE .011 3.15 LG 4.0"
 BORON Ø 3.6 AL2 O'LOCK
 BRACING .0015 TUNGSTEN

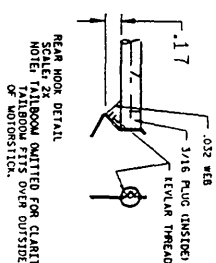
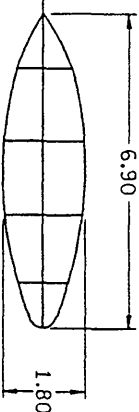
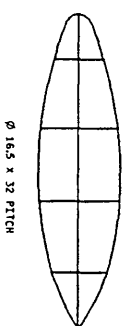
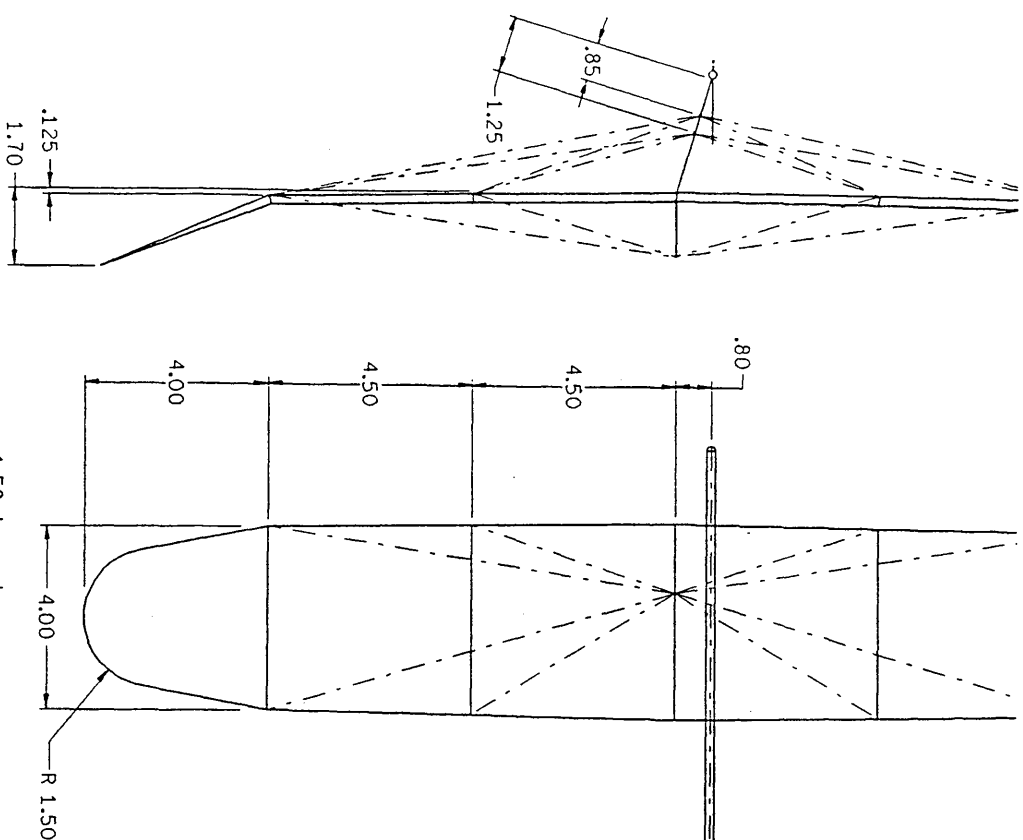
TAILBOOM
 BORON Ø 6.12 O'LOCK
 .007 4.0" .26 O.D. - .15 O.D.

WING
 AIRFOIL 5% ARC
 L/E SPAN .028 x .040 3.5"
 TAPER .0028 x .025 3.5" BOTTOM, & OUTSIDE OF ALL SPANS
 RIBS: .022 x .040 4.5"
 TIPS: .023 x .040 / .023 x .030 6"
 AIRFOIL .030 x .045 / .023 x .030 5"
 BRACING .0005 TUNGSTEN

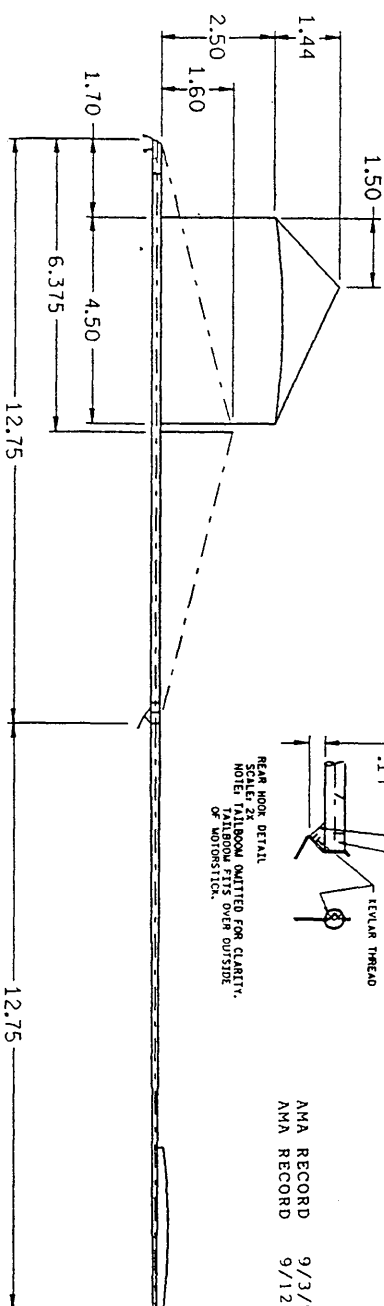
SLAB
 AIRFOIL 2% ARC
 L/E & 1/2 SPAN .021 x .045 / .021 x .030 4.3"

Dimensions:
 Top view: 3.50" (total width), 3.40" (inner width)
 Side view: 3.40" (height), 5.00" (diagonal length)
 Detail view: 1.25" (total width), .85" (inner width), .80" (height)

UNITED STATES	.011	3.5*	22.10.
FRONT MECH	.018	X .75	LC 4.0*
NEAR MECH	.011	X .50	LC 4.0*
REAR MECH	.011	X .50	LC 4.0*
POSTI	Ø .050	7.80	3.5*
MOON	Ø .010	WIRE	
WIRE	Ø .010	WIRE	
BORON Ø	1.6A.12	Ø 0.000	
BRACHING	.0015	TUNOSTEN	
7A1B004			
BORON Ø	.007	4.0*	.28 O.D. - .15 O.D.
Ø 0.12	Ø 0.12		
WING			
AIRFOIL	5% ANC		
L/E SPAN	.028 X .040	1.5*	
1/E SPAN	.028 X .040	1.5*	
WING	BORON Ø .000	Ø 0.010	Ø .0010
CLASIER	.022 X .040	4.0*	Ø .0010
CLASIER	.010 X .040	Ø .023	X .020
POSTI	Ø .050	7.80	3.5*
BRACHING	.0003	TUNOSTEN	
51A8			
AIRFOIL	2% ANC		
L/E SPAN	.018 X .040	4.0*	
RIBS	.018 X .040	4.0*	
AOL POSTI	Ø .035	5*	
PROP			
SPAN	.010 X .040	Ø .020	X .020
OUTLINE	.020 X .020	Ø .020	X .020
RIBS	.018 X .018	4.5*	
CS&R BANKS	V/P PROF	HUB	



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

PHOENIX

PROP BEARING DETAIL
SCALE: 2x

BY: LARRY COSLICH
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 Kazumasa 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,



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 Mzlg	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 Slusarczyk	—	—	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 Slusarczyk	----	----	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 desperate for materials, plans and building articles. Don't be bashful - send them in!

Feather Shooter

Category I Indoor Record Holder

By Bob Blenenstein, 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	<u>0.20</u>
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.

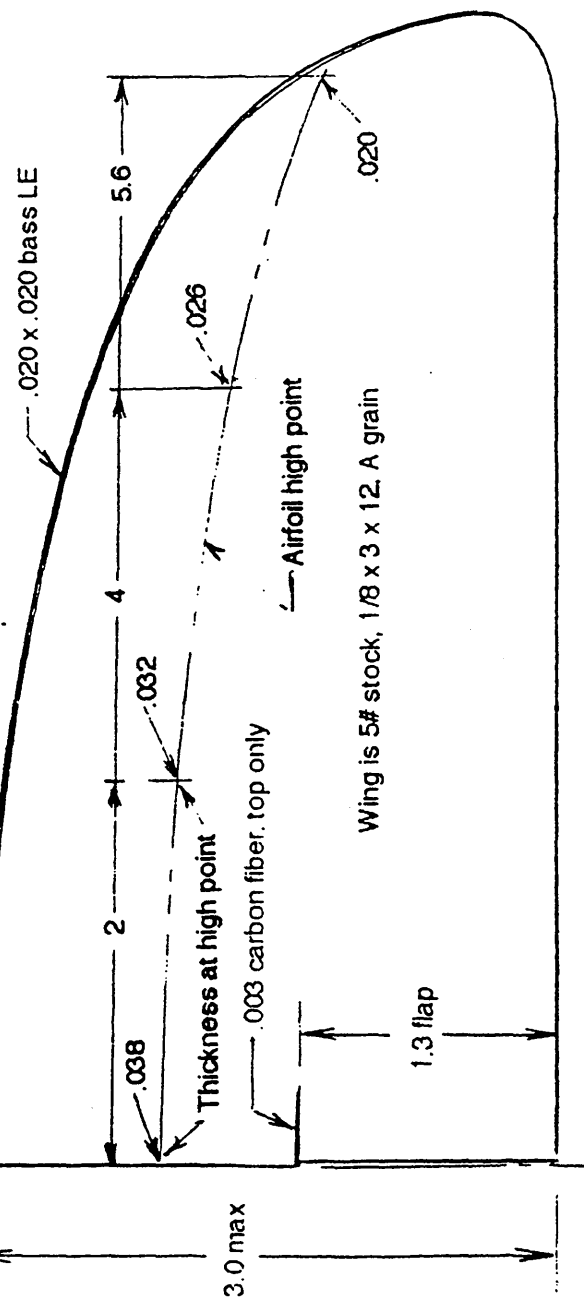
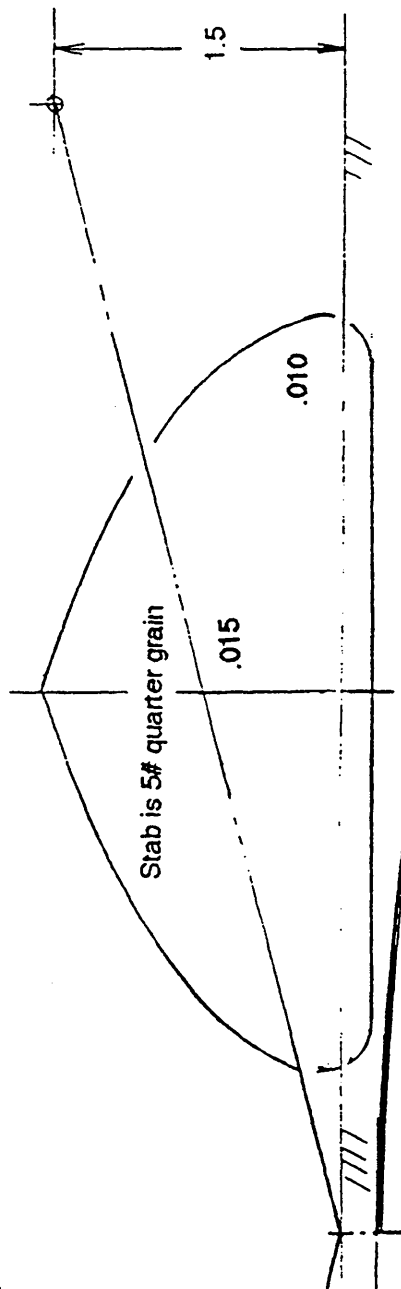
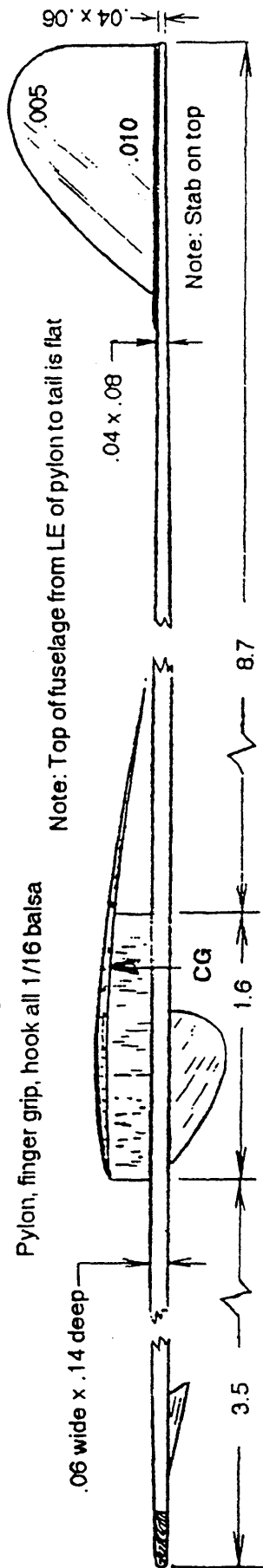
Final tweaking should produce a left launch and a left glide with a near-vertical launch.

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!

Fuselage is 10# 1/16 A grain

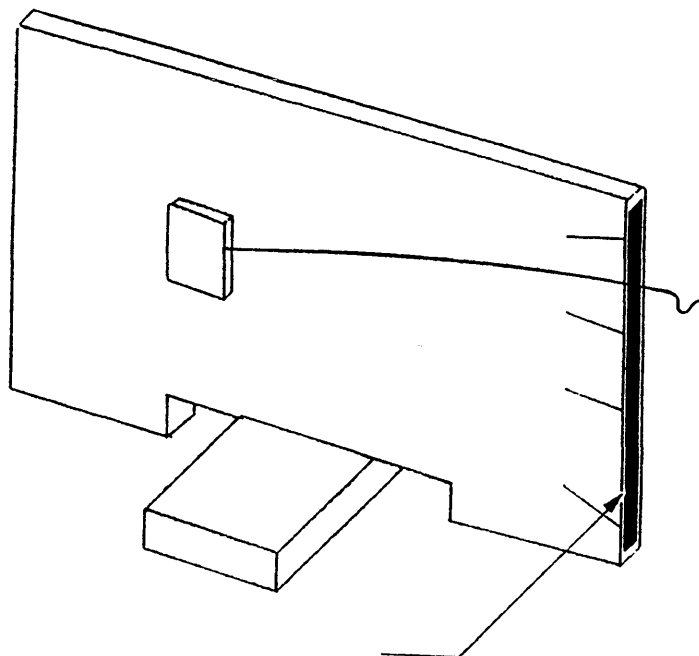
Pylon, finger grip, hook all 1/16 balsa



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	
010/01/95		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

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 Mississauga, 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 ducocement 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.

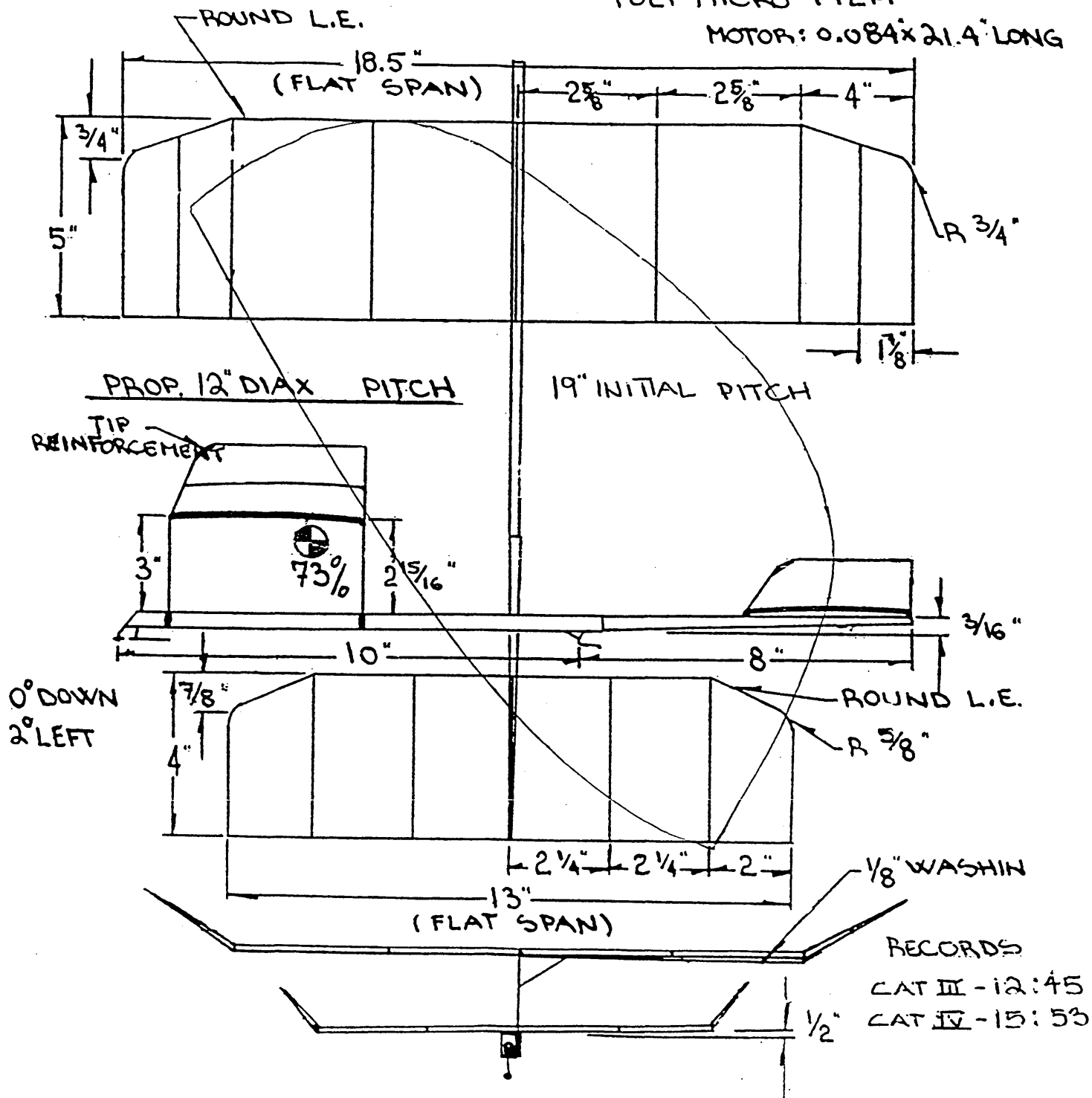
If you have any questions, don't hesitate to contact me:

Vladimir N. Linardic
3620 Kaneff Cres. #704
Mississauga, Ontario
L5A 3X1 Canada

DIHEDRAL RAISE TIPS TO GIVE
18" SPAN ON WING & 12" ON STAB

COVER MODEL WITH
POLY-MICRO FILM

MOTOR: 0.084" x 21.4" LONG



"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. <u>NO</u> 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*

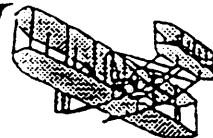
*Special rules for very small rooms only!
(Living Room flying.)

KIBBIE DOME

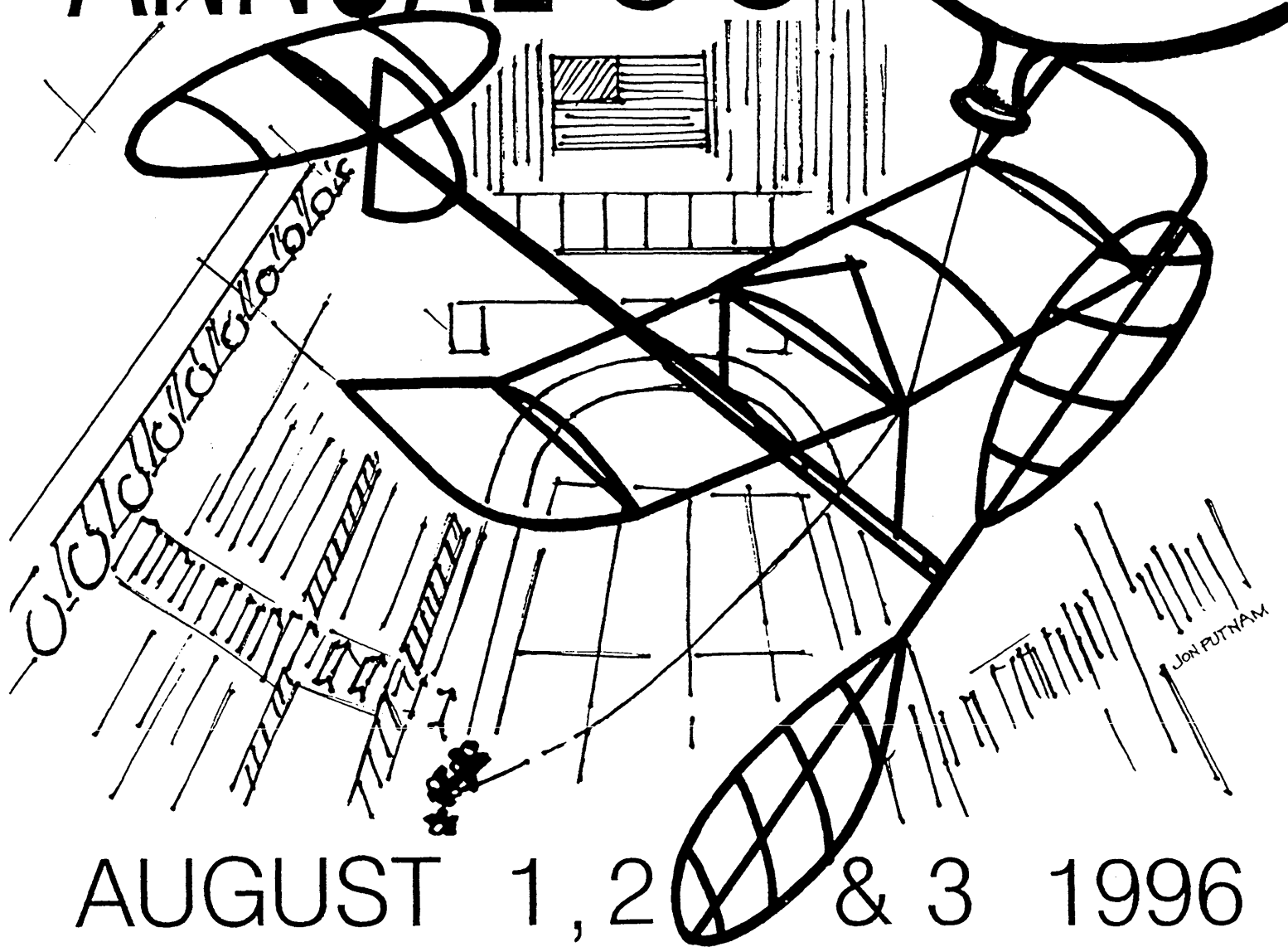
ISSUE #87 MAY, 1996

INAV

Indoor News
and Views



ANNUAL '96



AUGUST 1, 2 & 3 1996
UNIVERSITY OF IDAHO
MOSCOW, IDAHO

SPONSORED BY
INDOOR MODELERS NORTHWEST
INDOOR FLYING AT IT'S BEST

INDOOR NEWS AND VIEWS (INAV) IS
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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:

HPIETH@AOL.COM

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 1/4 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 1/4" 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 3 1/2" 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 3/4" x 3/8 and 1"x1"x3/4. 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 1 1/8" 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 through the fiberglass rod components at a fishing equipment shop.

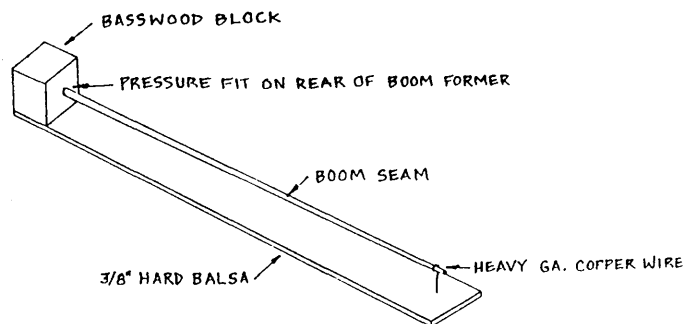
I usually use the traditional method of cutting an exact size tapered blank. Assuming that you are using a .250" i.d. motorstick, locate the .235" o.d. point on the boom form. Wrap a piece of .125" wide masking tape around the .235" diameter. Measure 13" down the form and wrap a second .125" piece of 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.

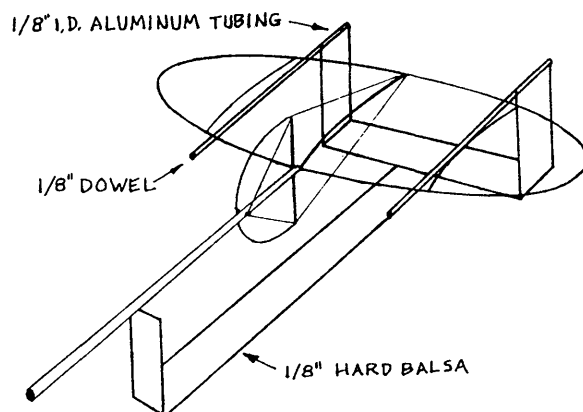
Position the outline on the building board and adhere the balsa to the board with water. Do not get water on the inside of the outline. Using a 3/16 round sable brush adhere the ribs to the balsa sub-ribs with water. This will keep the ribs straight. Make one pass around the outside of the stab leaving 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 to 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 explicitly 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

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.
2. The rubber bunches up next to the prop hook and stops the prop intermittently or completely.
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.
4. The rubber "climbs" the prop shaft, throws the thrust line off center and causes the prop to wobble.
5. The rubber "spits" out the noseblock toward the end of the flight, causing the model to dive into the floor.
6. The motor peg slides out on one side in a cabin model during the flight.
7. A fully wound lubed motor cannot be handled and valuable turns are lost when the motor is attached on a stick model.
8. A fully wound motor breaks inside a cabin model destroying most of the fuselage and the tail feathers.
9. You wonder why you are not getting as many turns in your motor as your buddies.
10. You're totally fed up with the craziness of rubber motors, but you don't want to give up flying indoors.

SOLUTIONS

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. 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. Discard any motor which grapevines during winding. The motor has been wound too many times, or is improperly lubed.
4. The prop shaft is a loose fit inside the bearing. Change to a tighter bearing.
5. Noseblock is loose. Use card stock (not balsa) shims to refit noseblock.
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. 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. 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. 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. 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

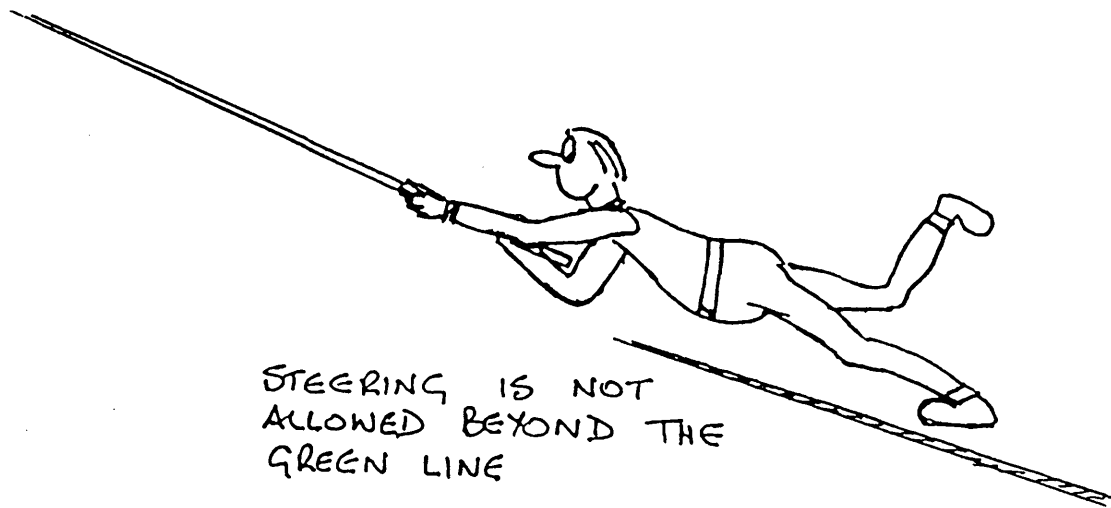
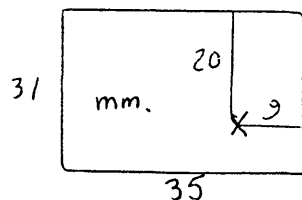
Rubber stripper-a follow-up:

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, although 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-~~n~~ 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



By: Phil Alvirez

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 Oppgaard (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 length (10 to 20 ft.) and place in a shallow 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, then 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. Mark 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 times during the day.

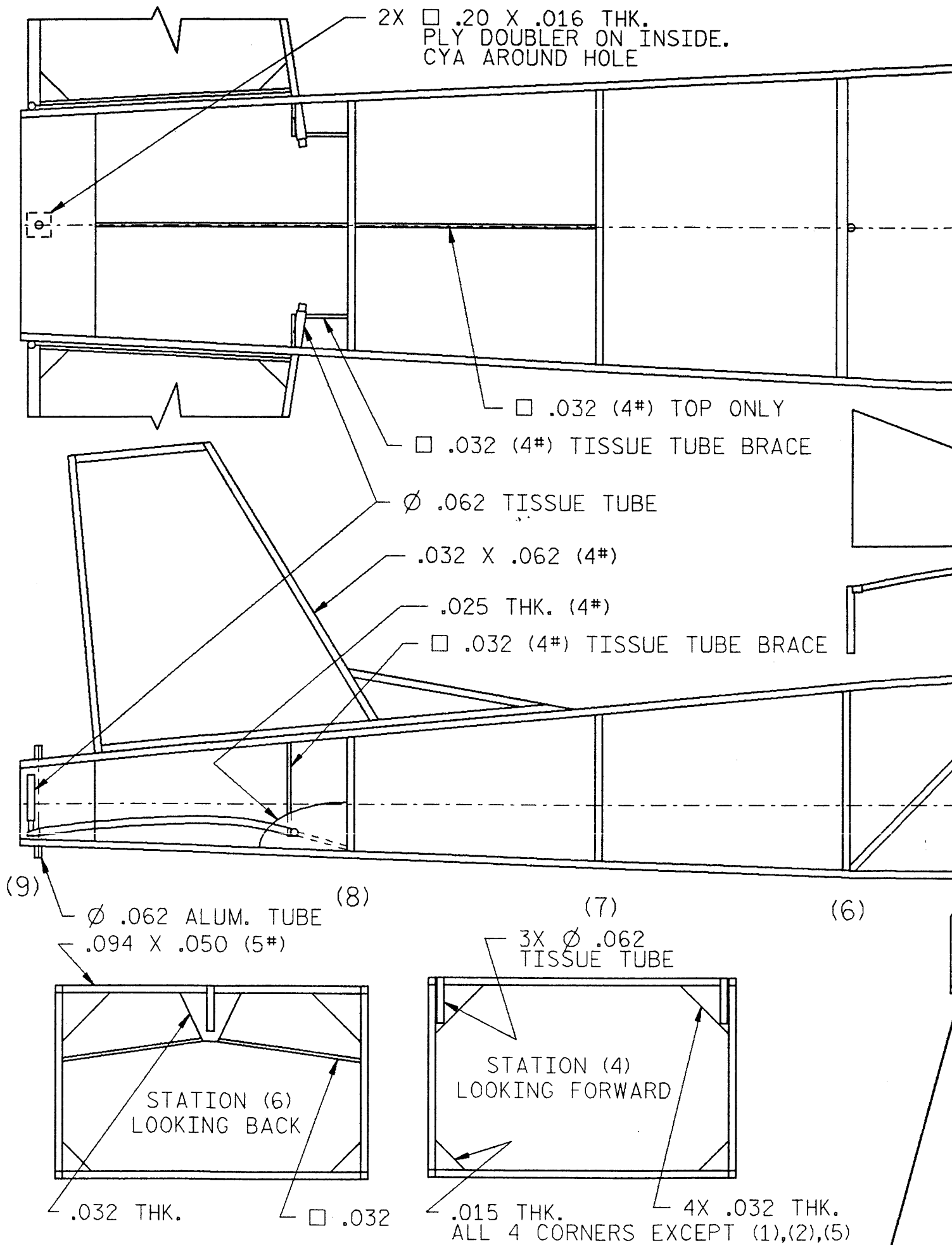
Contestant	10:30 am	1:35 PM	4:30 PM
A	20:38	21:01	22:59
B	21:47	22:07	23:03
C	19:45	22:51	23:10

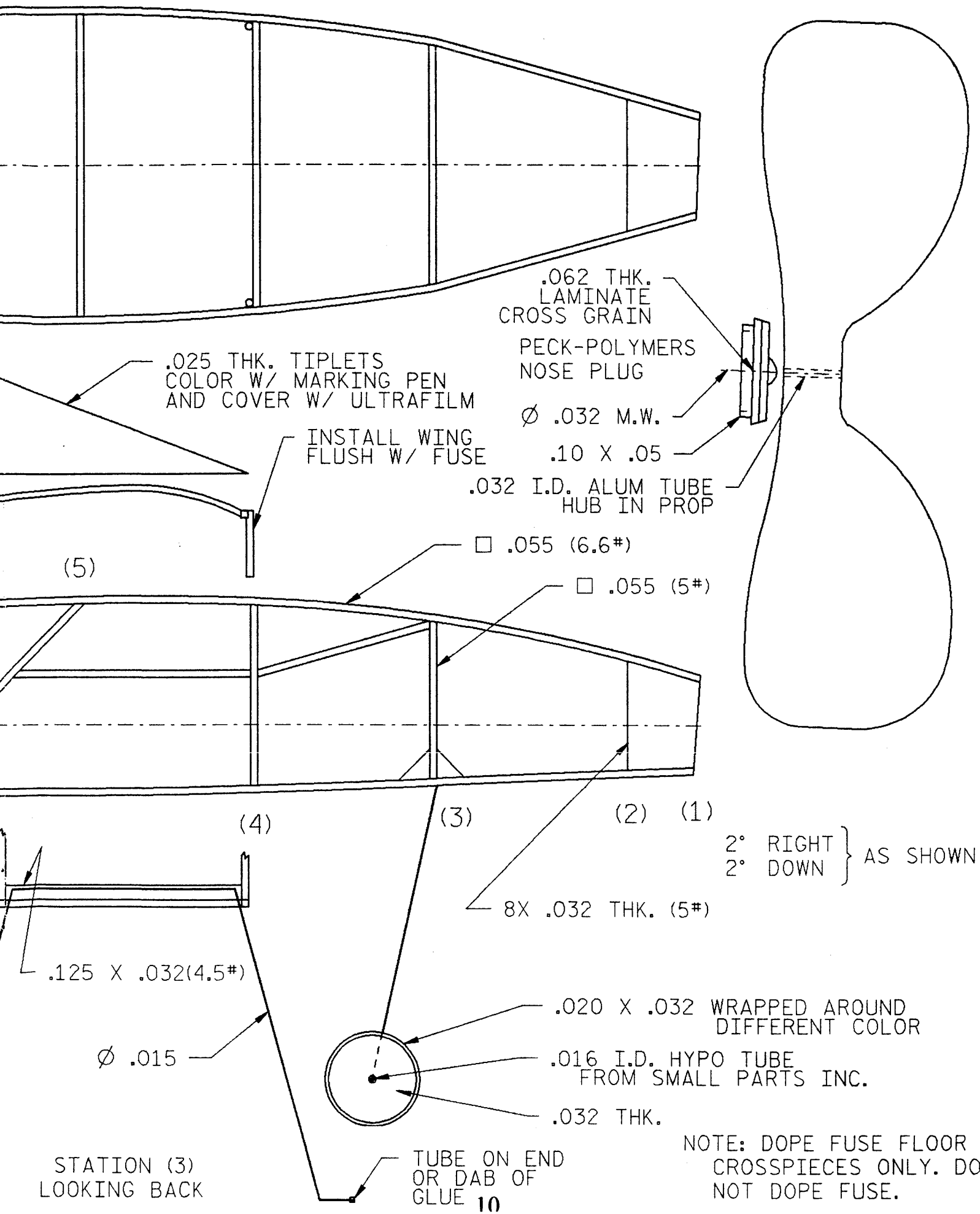
Contestant C wins the contest, with B second and A third. All nine flights broke the record. If the CD did his work properly each flight qualifies for a record, in that no time is actually a record until it is homologated. The issue involved in this : should the AMA HQ be involved in issuing as many 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.

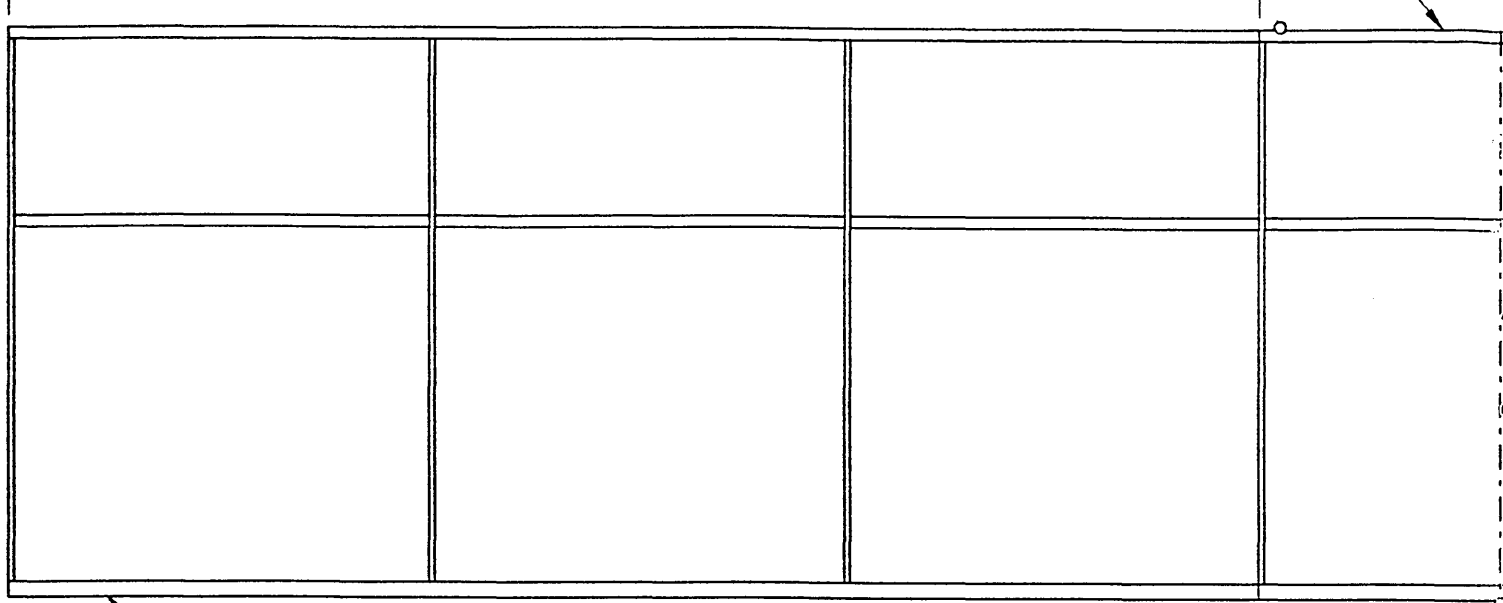
On the postcard (letters are OK) state: one record/day OR unlimited records/day.

Thanks for your help!





.60 DIHEDRAL
EACH TIP
TIPLETS GLUED TO OUTSIDE OF RIB, MAKE SURE SPAN IS 16"

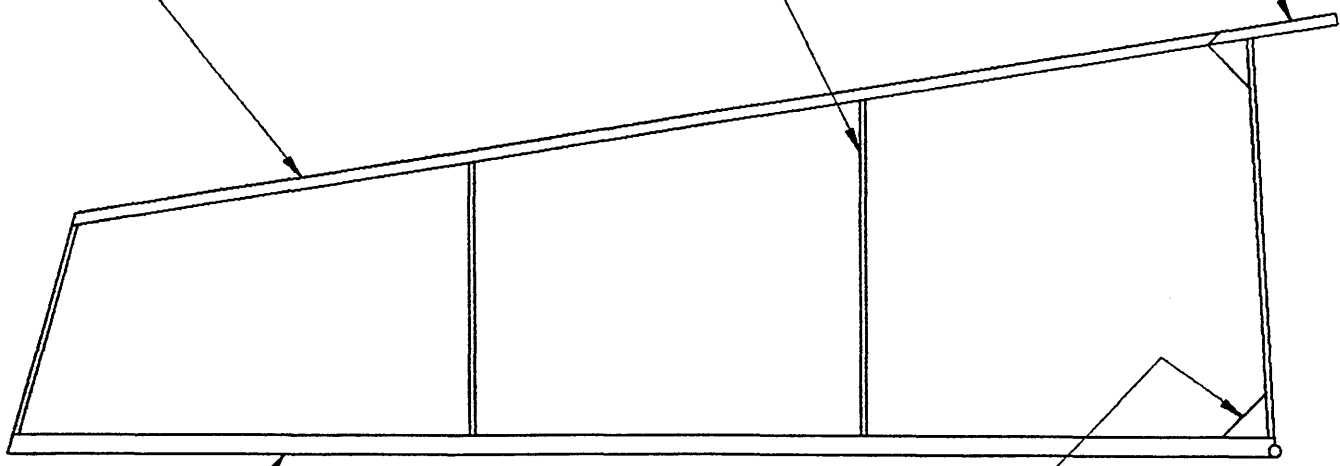


.070 WIDE X .062 (6#)
TAPER TO .050 AT REAR

□ .062 (5#)
SLIGHTLY ROUND FRONT

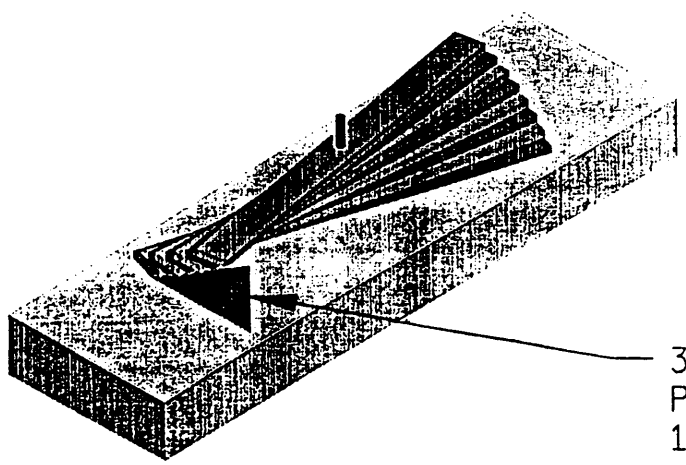
.032 X .062 (4.5#)

(8#) POS



.100 X .062 (4.5#)
TAPER TO .032 AT REAR

.020 THK. (4#)

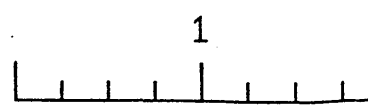


30° ANGLE AT TIP
PROVIDES
10.86 PITCH

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 .1
PROP W/ NOSE

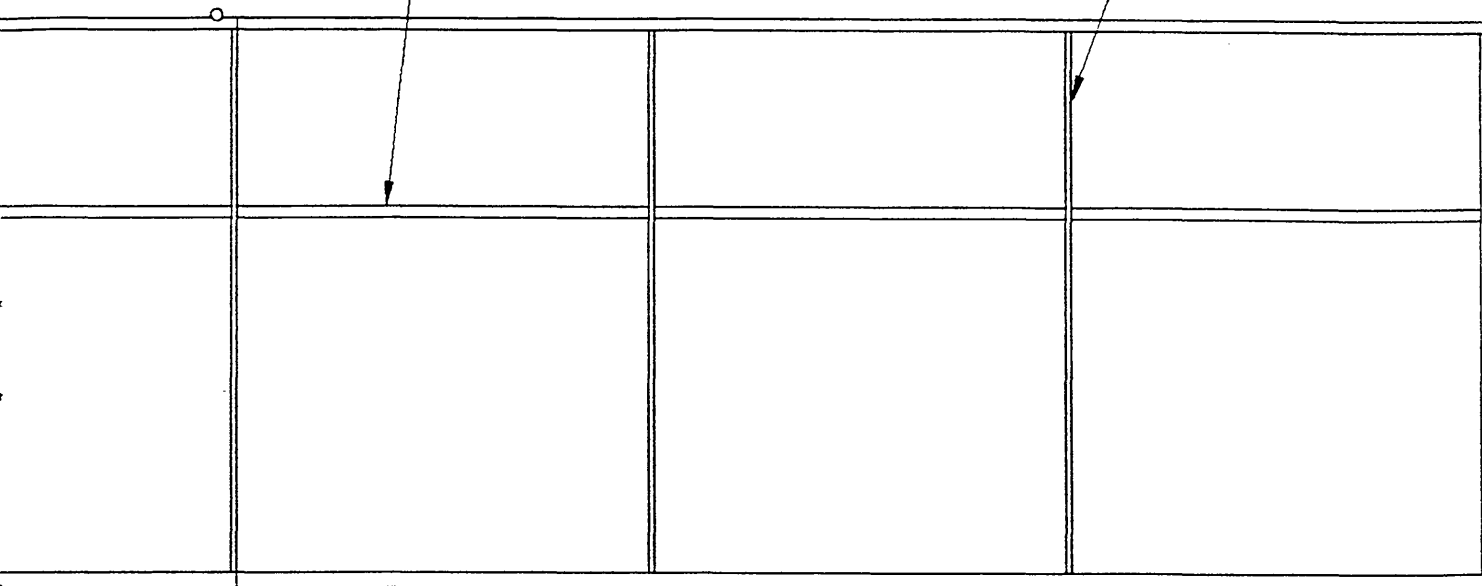
NOTE: BUILD WING FIRST
FUSELAGE PLACE TOP
FRONT PAPER TUBES A



0.062 (7.5#)
SLIGHTLY ROUNDED

□ .062 (6#)
GLUED BETWEEN EACH RIB

.032 X .062 (4.5#)

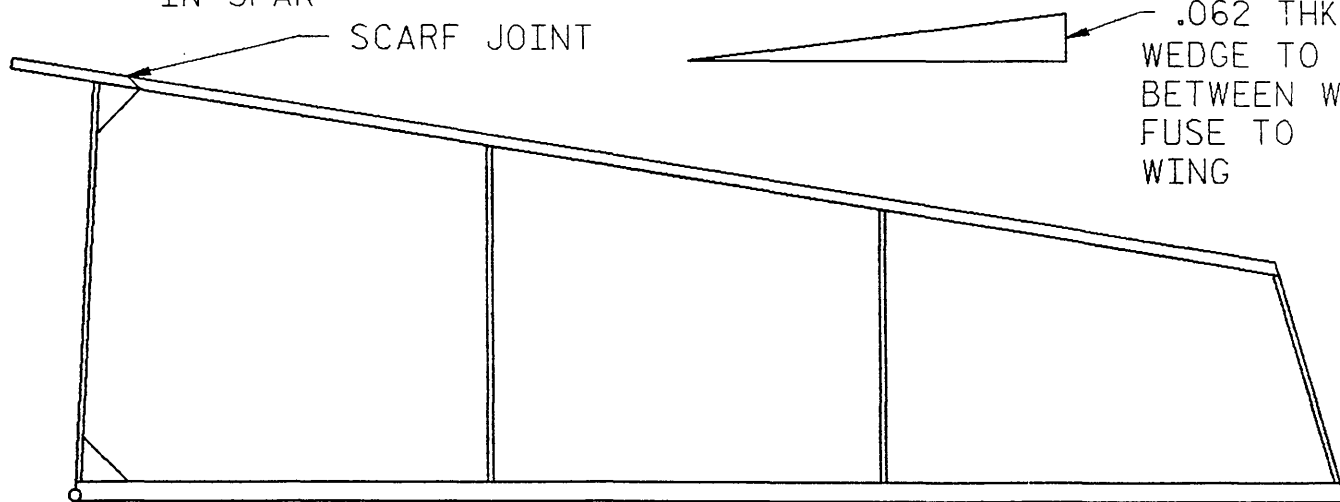


TS

Ø .062 X .50 (8#)
WING POSTS ARE
SLIGHTLY RECESSED
IN SPAR

.032 WASH-IN ON RIGHT WING PANEL
MODEL FLIES TO RIGHT

SCARF JOINT

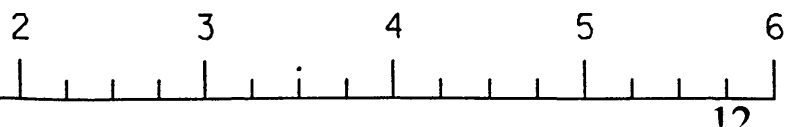


.062 THK. (10#)
WEDGE TO SLIDE
BETWEEN WING &
FUSE TO REMOVE
WING

WEIGHTS

GRAM
1.0 GRAM-COVERED W/ GEAR 2.3 GRAM
GRAM
0.45 GRAM- COVERED .15 GRAM
E BLOCK 1.85 GRAM

, COVER AND PLACE POSTS. WHEN BUILDING
CROSS BRACE (6) LAST. MOUNT WING IN
AND THEN MOUNT REAR WING TUBE ASSEMBLY.

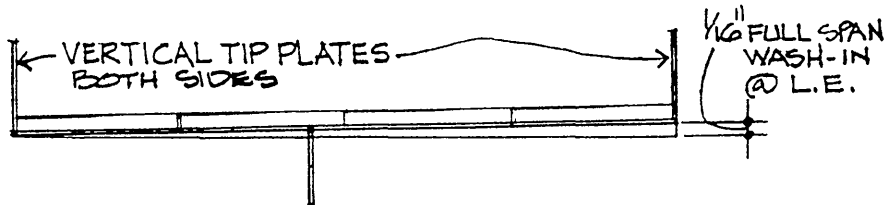


BEST FLIGHT 5:32 @ '94 U.S.I.C.
RUBBER .075 X 38" LOOP TAN II
5000 TURNS

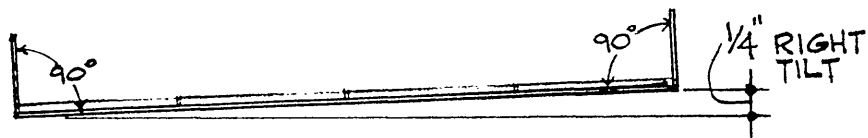
BOSTONIAN "PATRIOT"

DESIGNED BY: L.COSLICK
DRAWN BY: M.PALRANG

GRAIN O-WARP



WING FRONT VIEW = HALF SCALE



STAB. FRONT VIEW = HALF SCALE

7" DIA. x 15" TO 18" PITCH PROPS

.008" TO .010" C-GRAIN BLADES

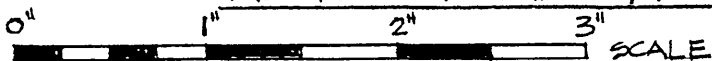
POWER WITH FAI-TAN II

.028" P. 0.030" x 13" ± LONG LOOP

MIN. MODEL WT. = .015 OZ.

MINI-QUARK

MINI-STICK DESIGNED BY
ANDREW TAGLIAFICO, 1995



.025" x .030"
5# A-GRAIN
2-RIDDERS REQ'D.
COVERING ON
OUTSIDE FACES

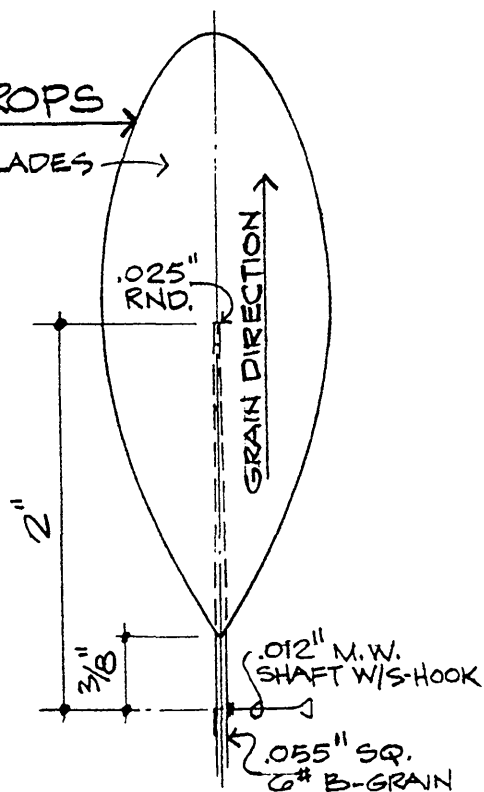
.080" x 5#

GRAIN
W. HOOK

.035" SQ. BOOM END

.012" x C-GRAIN GUSSET

5"



.035" I.D. RND. PAPER
TUBE FOR ADJ. STAB
W/ 6# RND. POST

BOOM END .045" ± VERTICAL
WITH NO SIDE OFF-SET

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	
Sauderisen, 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	
Thurthu, 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	
Alvarez, Phil	CANADA	478	48.3	1.288	615.803	
Skusarczyk, 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	
Tornita, 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
Yuiichi, 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, Mauro	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
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ROG Stick

CAT I	2/11/96	14:08	Larry Coslick
CAT II	4/11/96	14:32	Larry Coslick *

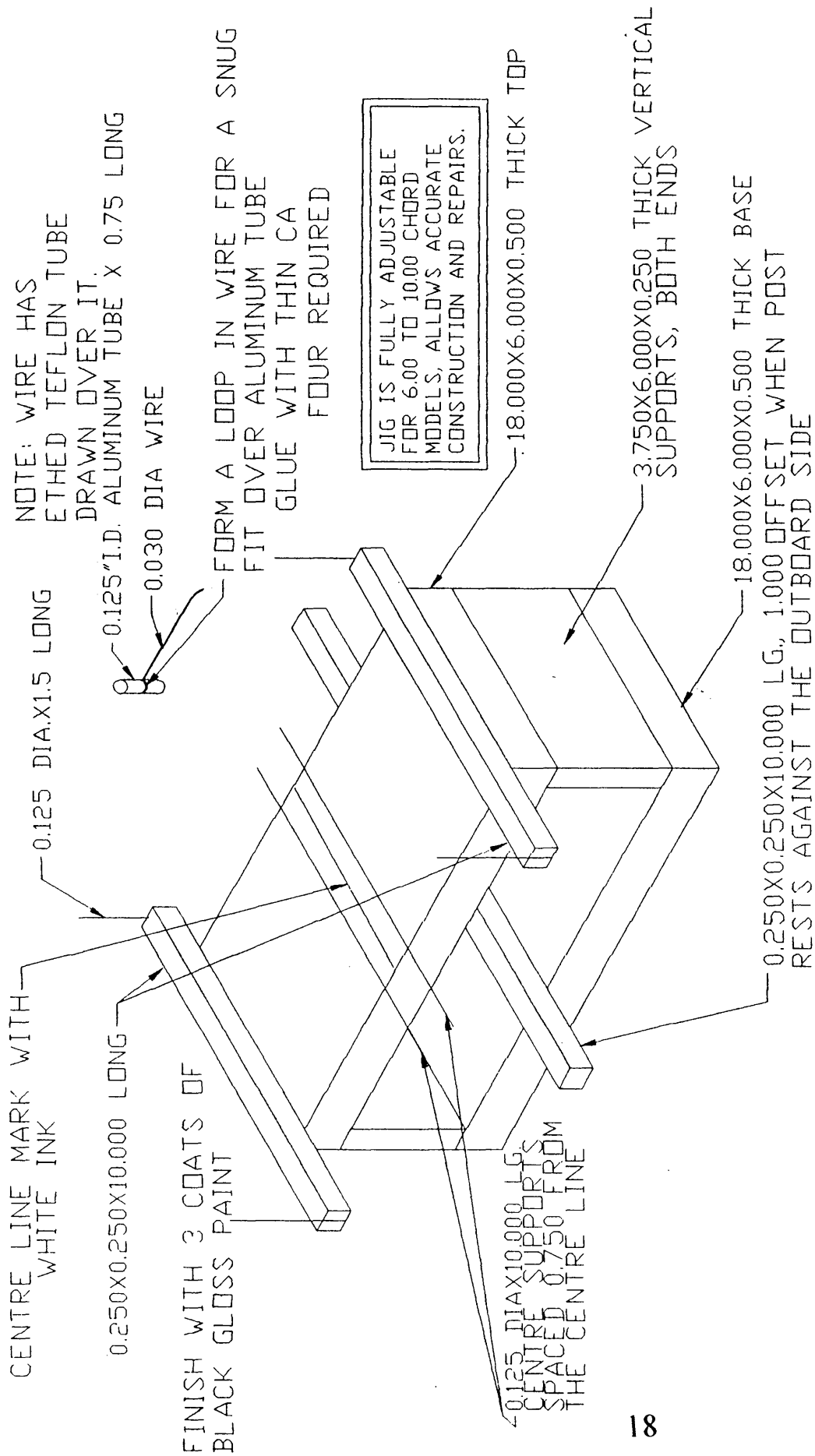
Pending *

F.A.I. MODEL SUPPLY

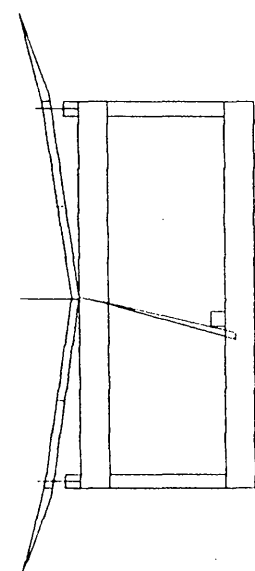
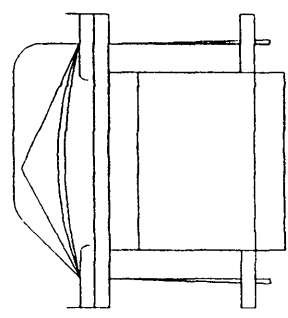
I.N.A.V. has recently talked to the new owner of F.A.I. Model Supply, John Capp. John has flown both indoor and outdoor rubber and understands and is interested in our needs. He will supply the same great quality rubber and in the same sizes as before.

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.

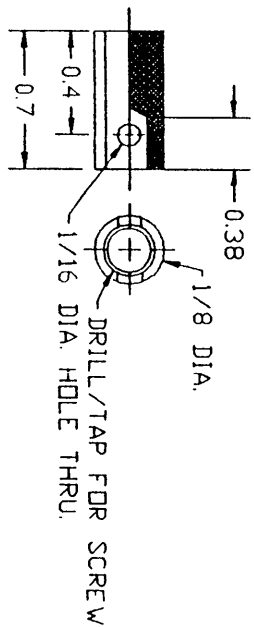
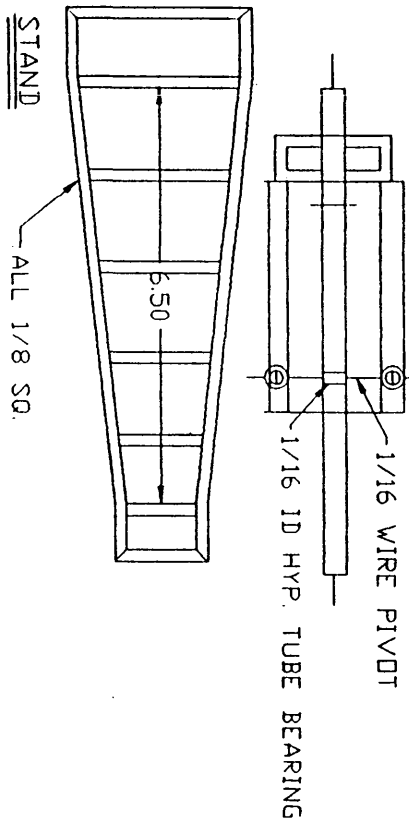
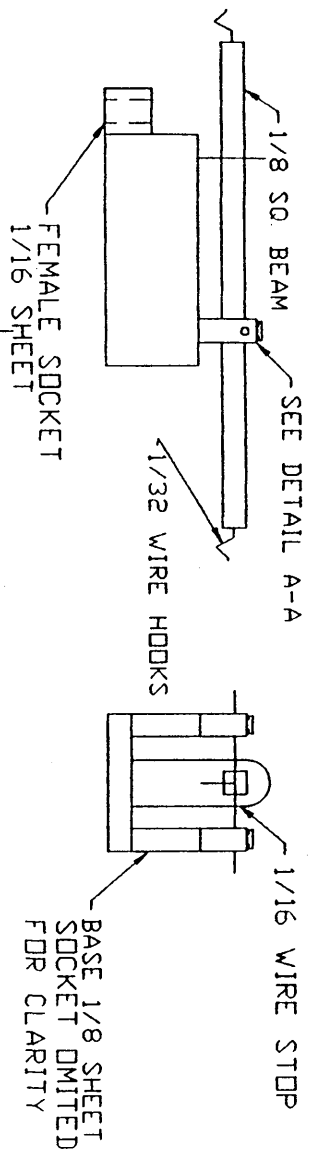
John said that he plans on attending the Indoor Championships at Johnson City this spring.



F1D
WING BRACING
JIG
DESIGNED AND DRAWN BY:
VLADIMIR N. LINARDIC

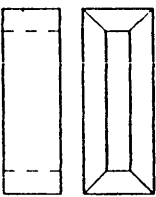


ASSEMBLY / WING MOUNTING DETAIL

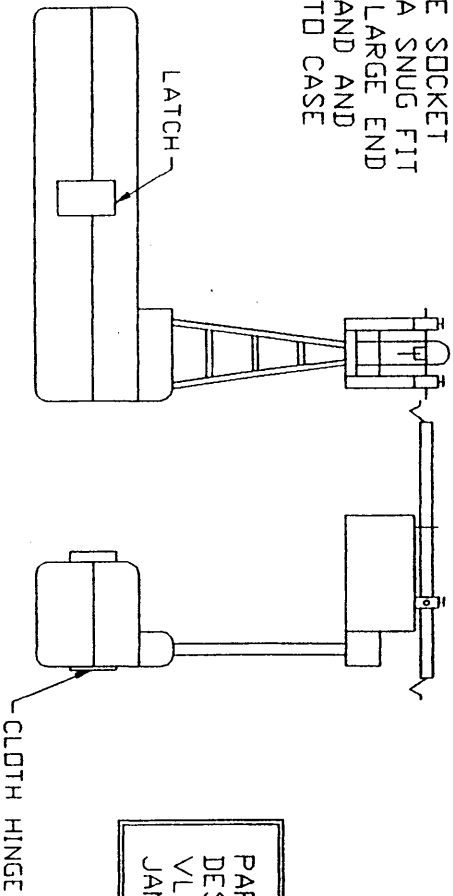


MATL.-BRASS
SIDE SHOWN IN 1/2 SECTION
DETAIL A-A

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.



FEMALE SOCKET
MAKE A SNUG FIT
OVER LARGE END
OF STAND AND
GLUE TO CASE



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 _____



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.
☐ 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:

- | | |
|--|--|
| <input type="checkbox"/> Double check and verify correct fees are enclosed | <input type="checkbox"/> All events are indicated |
| <input type="checkbox"/> Check(s) signed and payable to AMA | <input type="checkbox"/> No conflict exists in "one only" events, if applicable |
| <input type="checkbox"/> Name, AMA number, and complete address shown | <input type="checkbox"/> Team entry is in compliance with AMA rule book, if applicable |
| <input type="checkbox"/> Emergency contact information (above) | <input type="checkbox"/> Frequency information, if applicable, is complete and correct |
| <input type="checkbox"/> Have read all schedule and processing information | <input type="checkbox"/> Signature above |
| <input type="checkbox"/> All credit card information is given (expiration date, card number, card company) | |

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 UNIVERSITY 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 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	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 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
 [] 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

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:

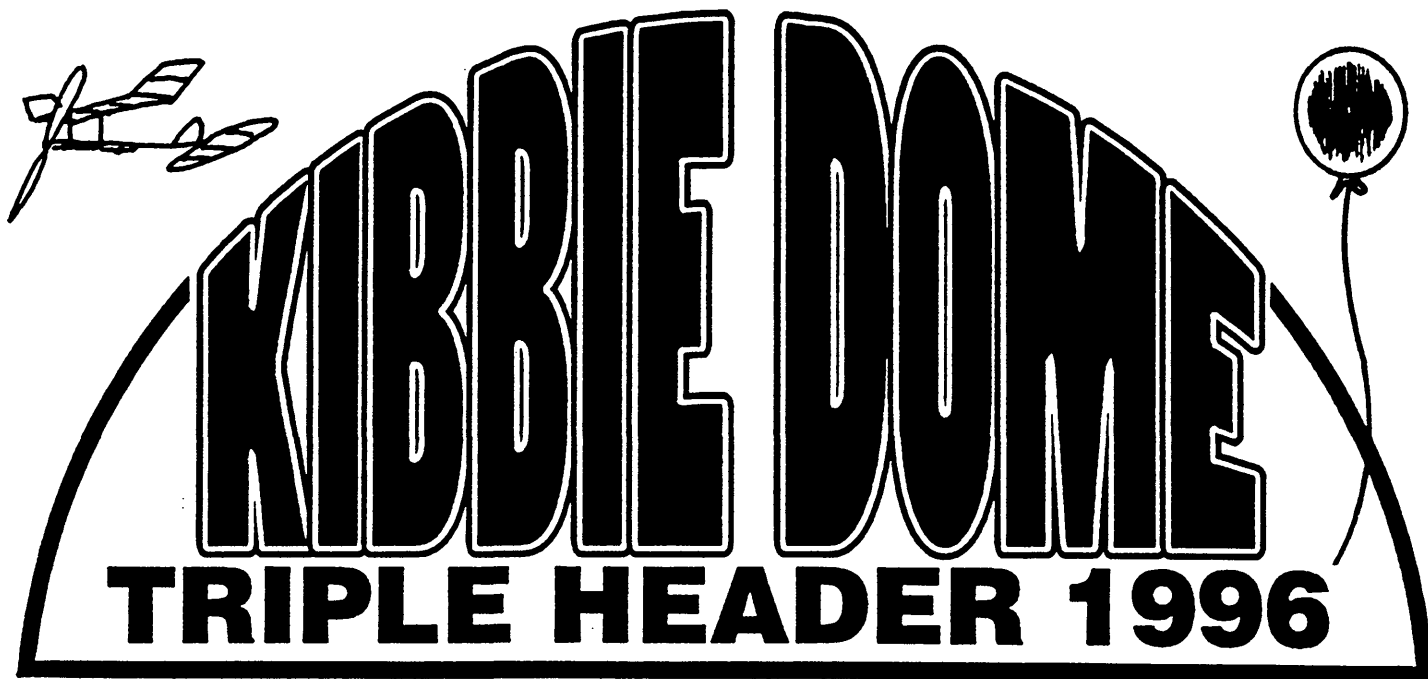
Name _____

Street _____

City _____

State _____ Zip _____ Phone: _____

USIC 96
 5432 HAFT ROAD
 CINCINNATI, OHIO 45247



KIBBIE DOME

TRIPLE HEADER 1996

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

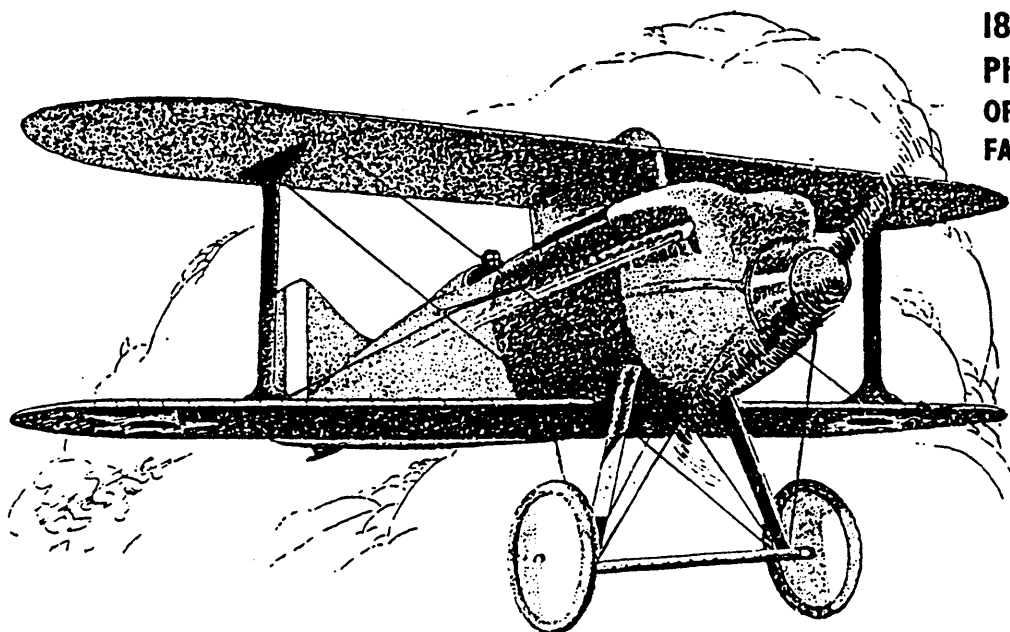
DOMEDUSTER

Plan Packet

6

A Baker's Dozen Full Size Plans

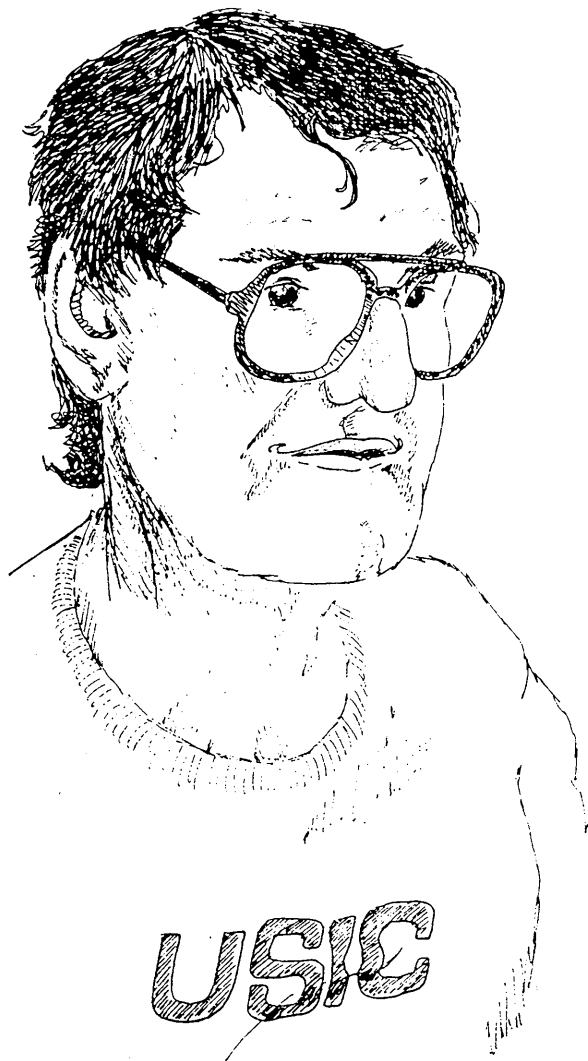
To:
Stanley Fink
 1810 Pine Street
 Philadelphia, PA 19103
 OFFICE: (215) 732-5014
 FAX: (215) 236-9598



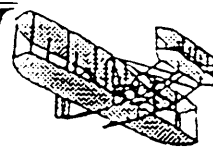
CONTRIBUTORS

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

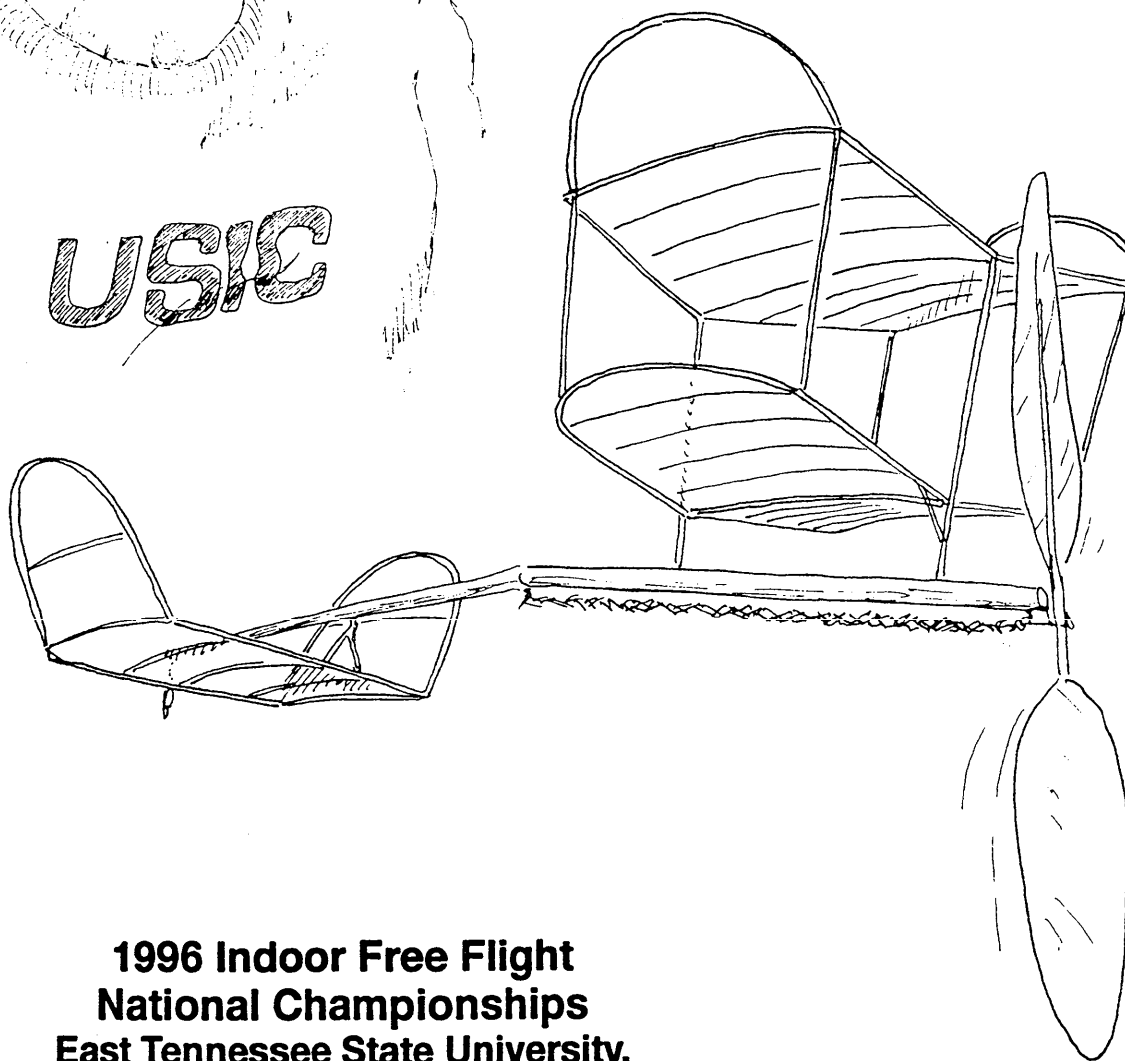
\$12.00 (incl. p/h)



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
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LARRY COSLICK, MARY JANE REILLY
HOWARD HENDERSON AND BILL
MARTIN.

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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~~ 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	
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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

								BEST	
PLACE	CONTESTANT	AMA NO.	1	2	3	4	5	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	1127	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	
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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	78.1	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	68.8	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	80.4	81.4		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	
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17			COMPLETE							
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1996 USIC PENNY PLANE # 207								
								BEST
PLACE	CONTESTANT	AMA NO.	1	2	3	4	5	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, MOCHAEAL	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	478
11	11	KROL, GREGORY	514743	2.5	3.46	2.29	2.22		2.5	3.46	3.96	1.15	455
12	12	SEAVAR, 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

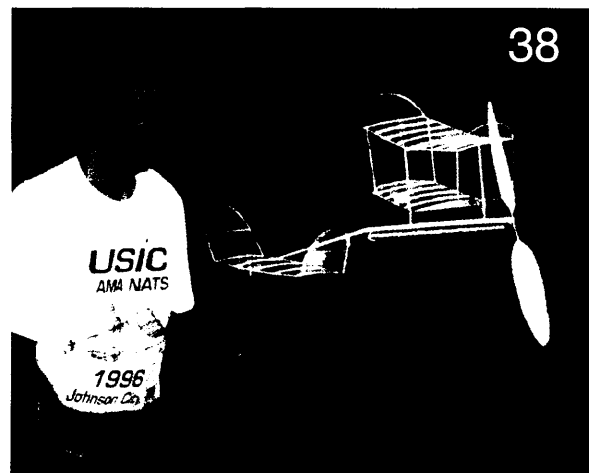
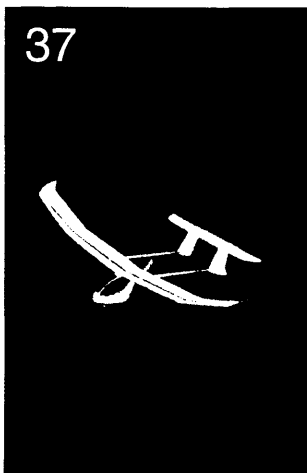
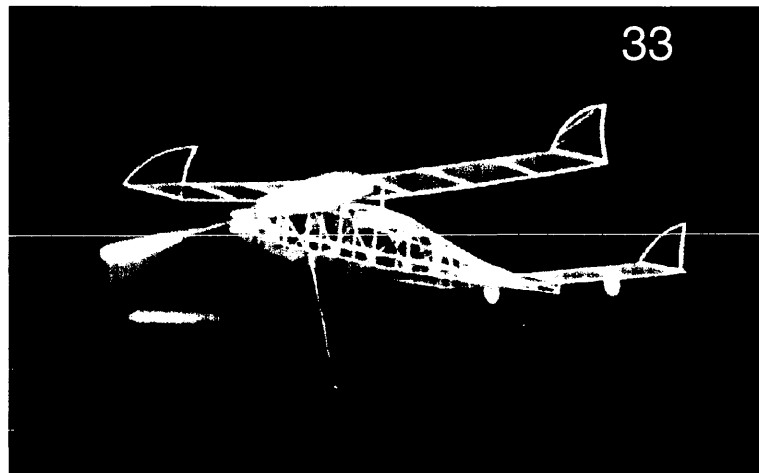
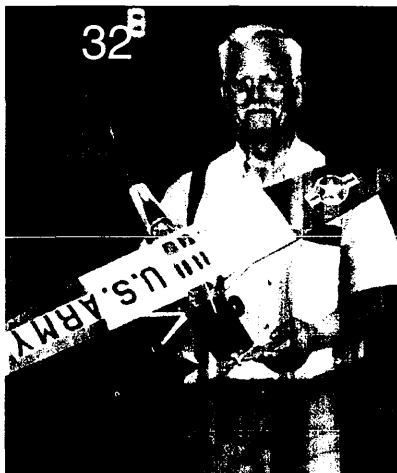
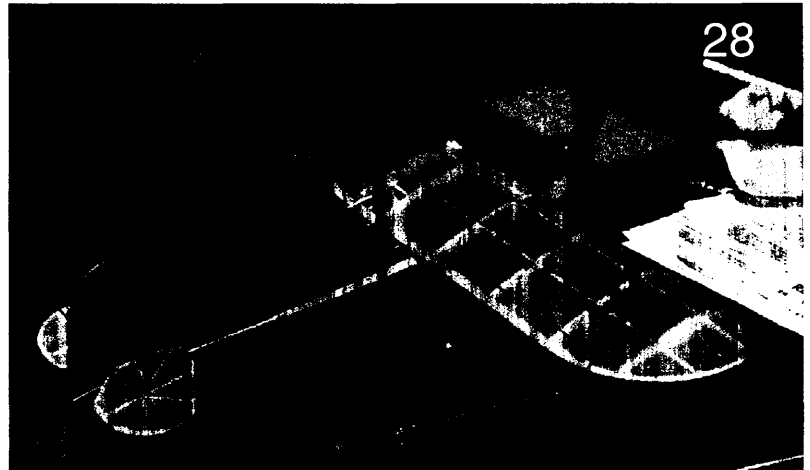
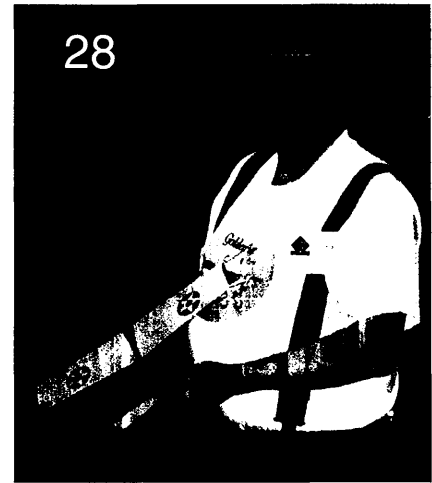
	PL.	CONTESTANT	AMA NO.	1	2	3	4	5	FLIGHT	FLIGHT 2	BEST 2	CHARISMA	TOTAL
15	15	GILBERT, S.	1803	2.26	2.38	2.24			2.26	2.38	3.04	1.1	334
16	16	RASH, FRED	63458	2.17	1.46				2.17	1.46	2.43	1.09	264
17		OLESON, DOUGLAS	480646										DNF
18		MAC ENTEE, R.	102085										DNF

1996 USIC 35 CM

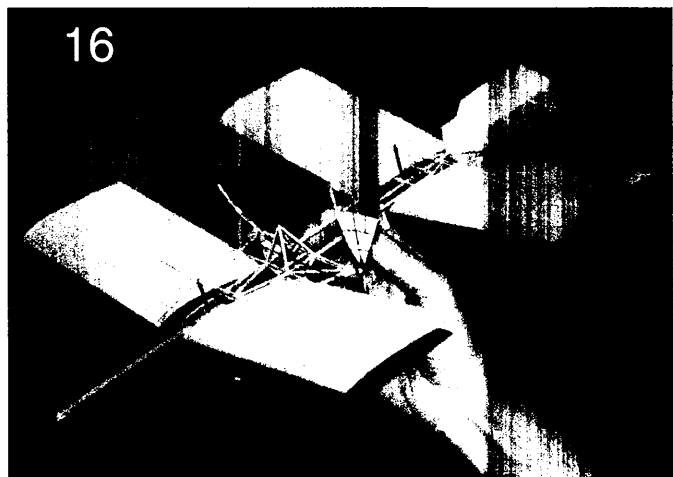
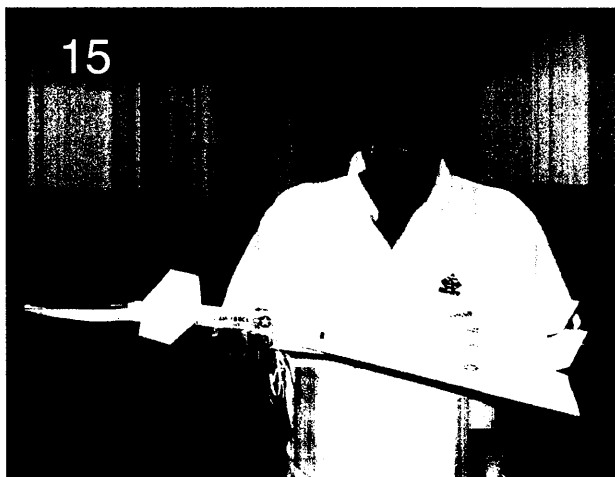
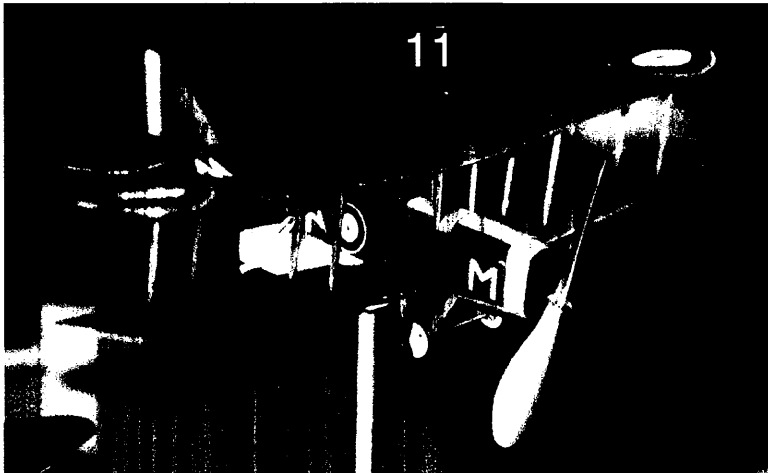
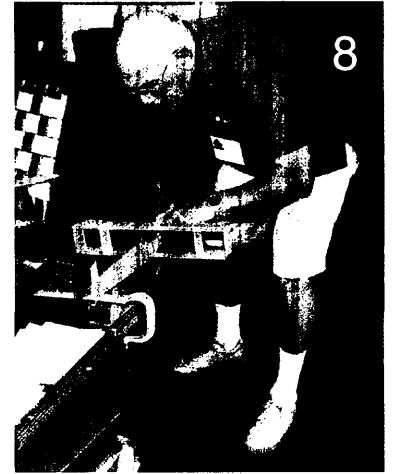
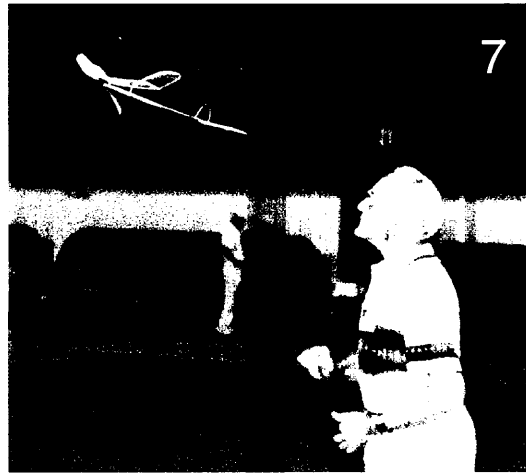
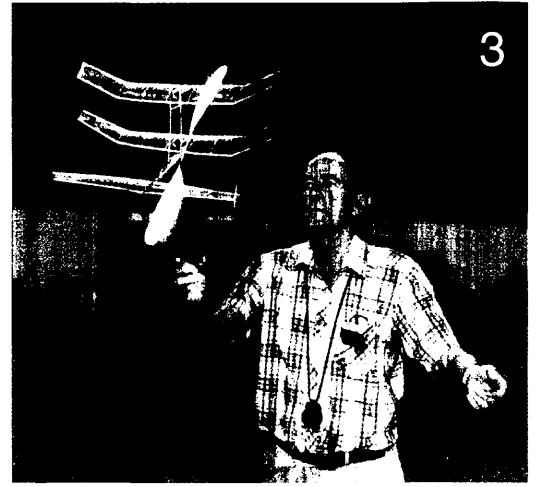
	PLACE	CONTESTANT	AMA NO.	1	2	3	4	5	BEST FLIGHT	GR. CH. PTS
1	1	SOVA, TOM	473169	18.37	18.47	21.18	23.06		23.06	
2	2	O'GRADY, DAN	F57	20.59					20.59	
3	3	ROMASH, ROB	130061	15.52	16.44	19.35	19.42		19.42	
4	4	FELLIN, JOHN	95353	4.58	10.1	14.29	15.16	17.21	17.21	
5	5	MAREK, DAN	2350	16.53	8.02	15.4	13.57		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

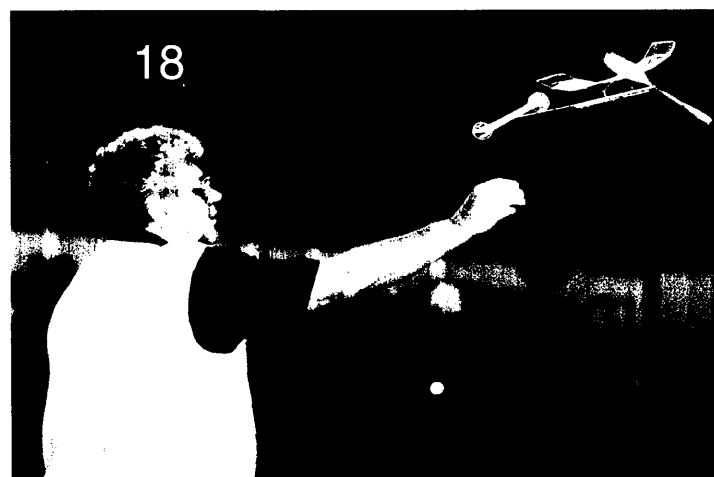
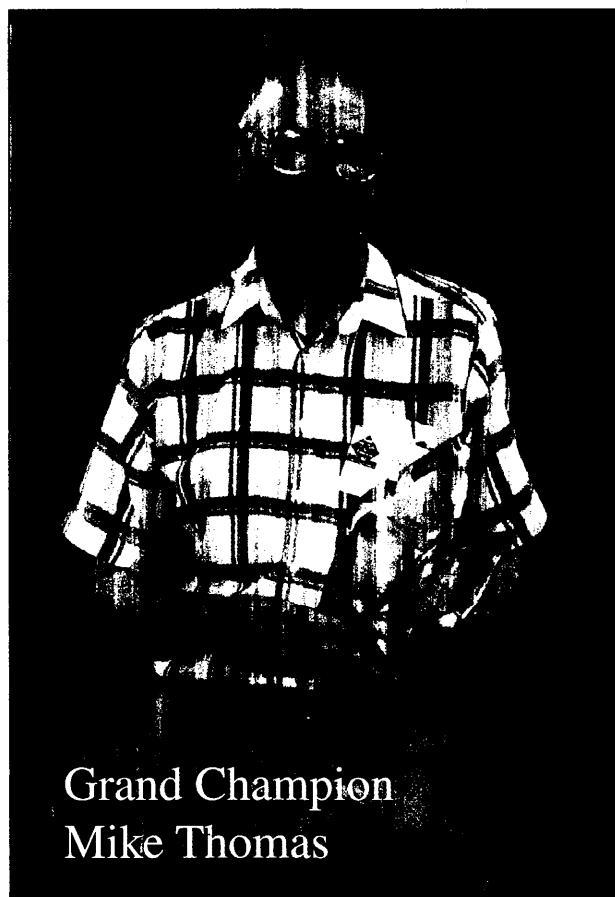
1. John Kagan and his lucky F1D. This model survived over thirty ceiling bumps on a single flight without damage or getting hung up.
2. Ted Seaver launching his twin finned mini stick. Mini sticks are very quick to build and quite popular.
3. Dan O'Grady launching his winning Pennyplane for a new site 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 Maret 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 McGillivray 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



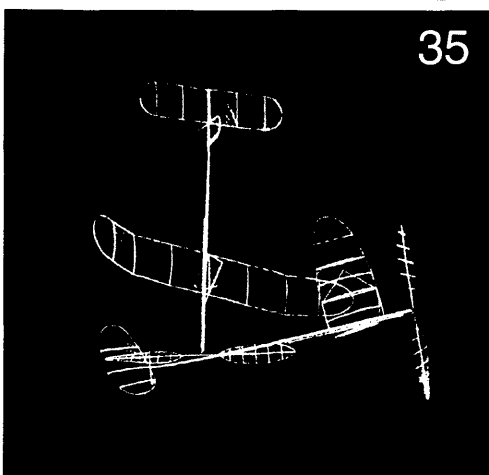
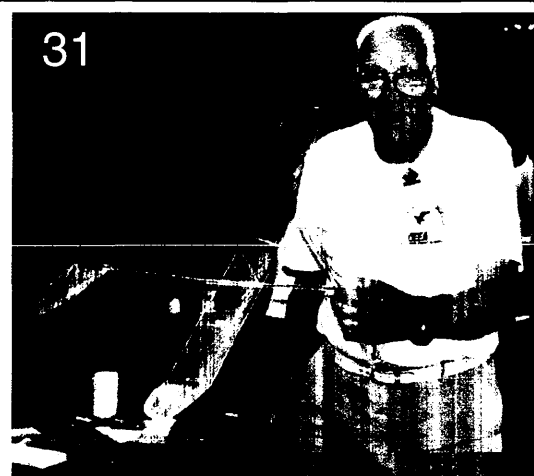
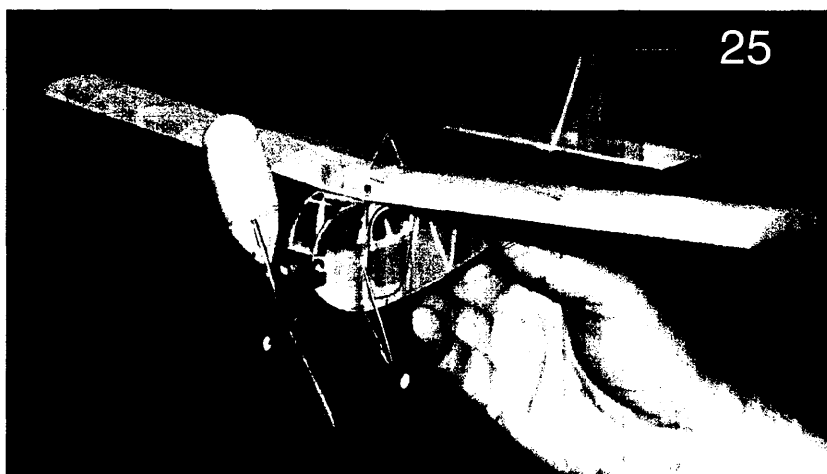
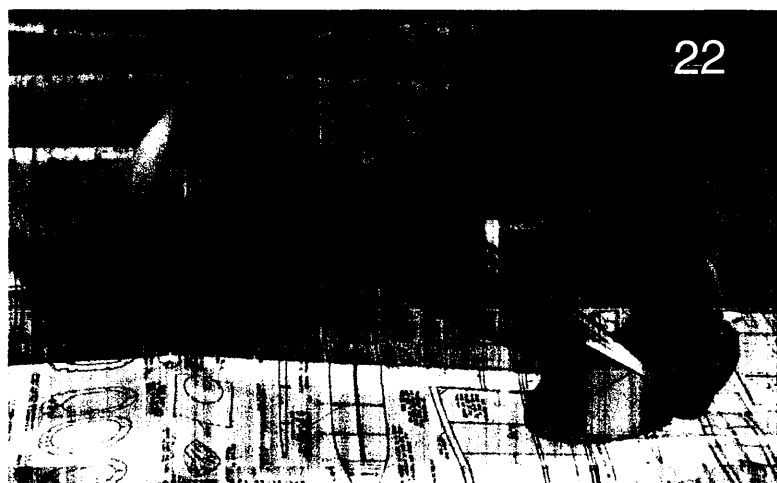
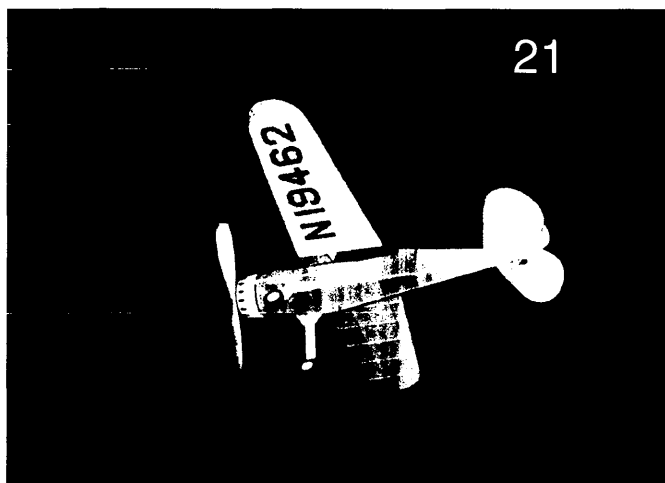
1996 USIC and AMA NATS // 1996 USIC and AMA NATS //



1996 USIC and AMA NATS // 1996 USIC and AMA NATS



1996 USIC and AMA NATS // 1996 USIC and AMA NATS



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	27	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	SEAUER, 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	118	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 PT	BEST 2 FLT	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	164	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	88	79	76	81	76		76	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			60		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		GANSER, RONALD	7532	1911 CESSNA	1:49	2:00			2:00	1:49	0:90	90	97	187
2		MCGILLIVRAY, JACK	F65	SE-5	1:04	1:13	0:90	0:90	0:90	0:90	0:90	90	93	183
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		GRANT, JAMES B.	159477	CLA-3	1:16	1:08			0:76	0:88	0:72	72	81	153
5		PASSARELLI, W.	15623	COUGAR	2:09	1:43			0:90	0:90	0:90	90	62	152
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

								BEST
PLACE	CONTESTANT	AMA NO.	1	2	3	4	5	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, LAWRENCE	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, MICHAEL	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	SEEVER, 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		SEEVER, 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		SEAYER, E.	397871	5.25	5.34	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

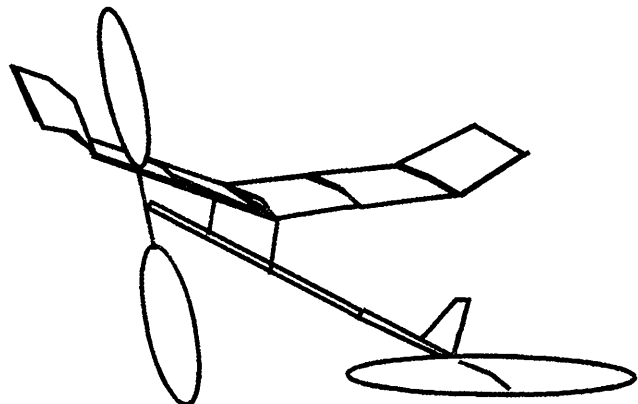
* Junior Entrant

** Father/Son team

Limited Pennyplane

I	16:14	Warren Williams	5/10	Original
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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 _____

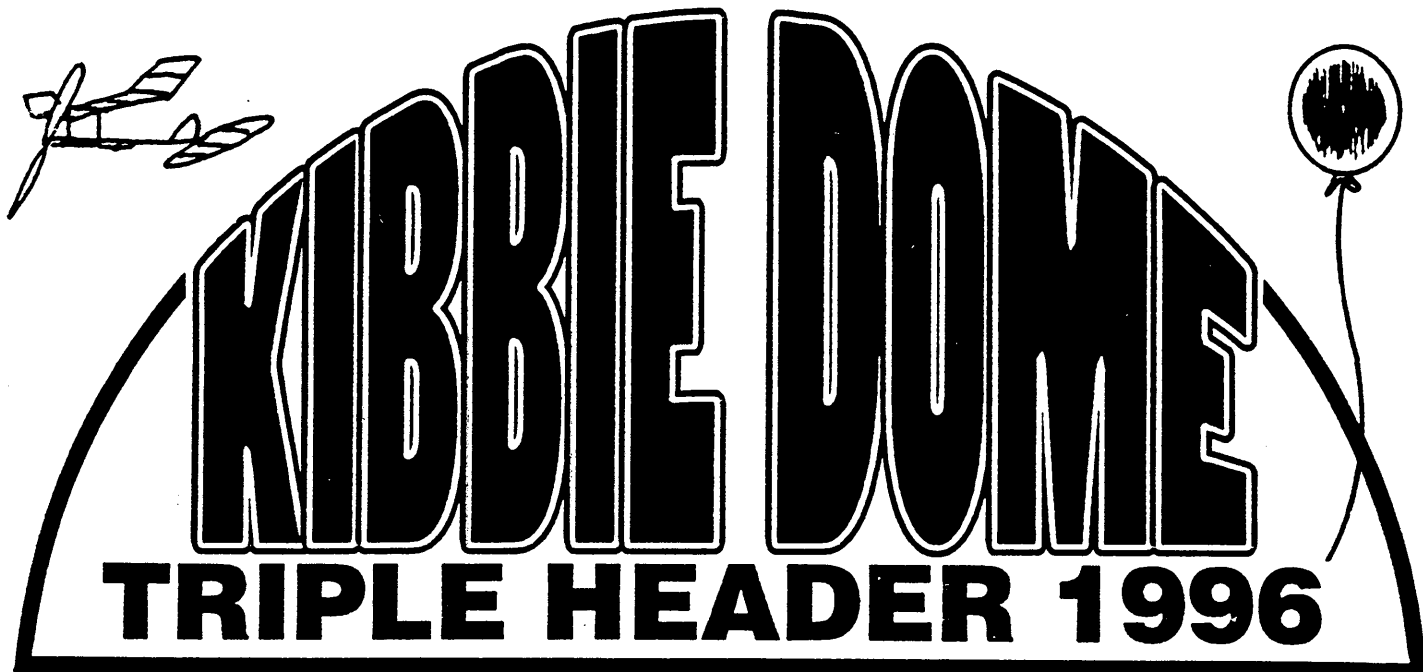
Ceiling _____

Contestant Name	1	2	3	4	5	Best	Rank
TEAM TOTAL							

I certify contest flow
correctly by rules

Notes

Contest Director



KIBBIE DOME

TRIPLE HEADER 1996

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.

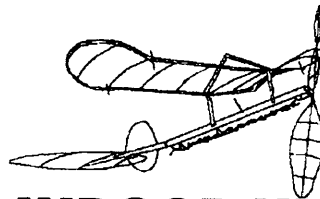
Meet Organizer/Patron: Andrew Tagliafico, 10039 S. W. Quail Post Road, Portland

OR 97219. 503/452-0546. *NOTE- Timer Volunteers are Needed.*

WORLD CHAMPIONSHIP CONTEST DIRECTOR: Bob Stalick

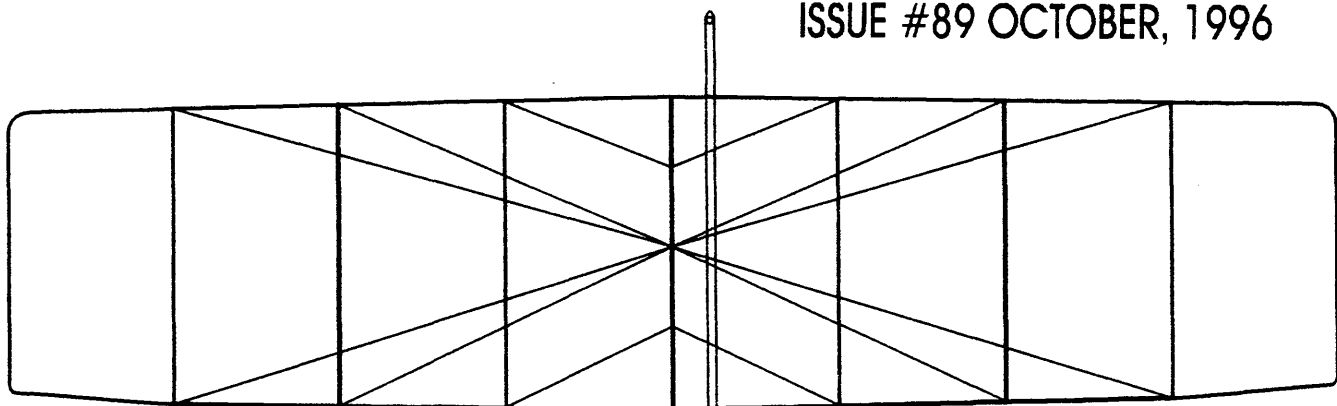
63:54!!!

INAV



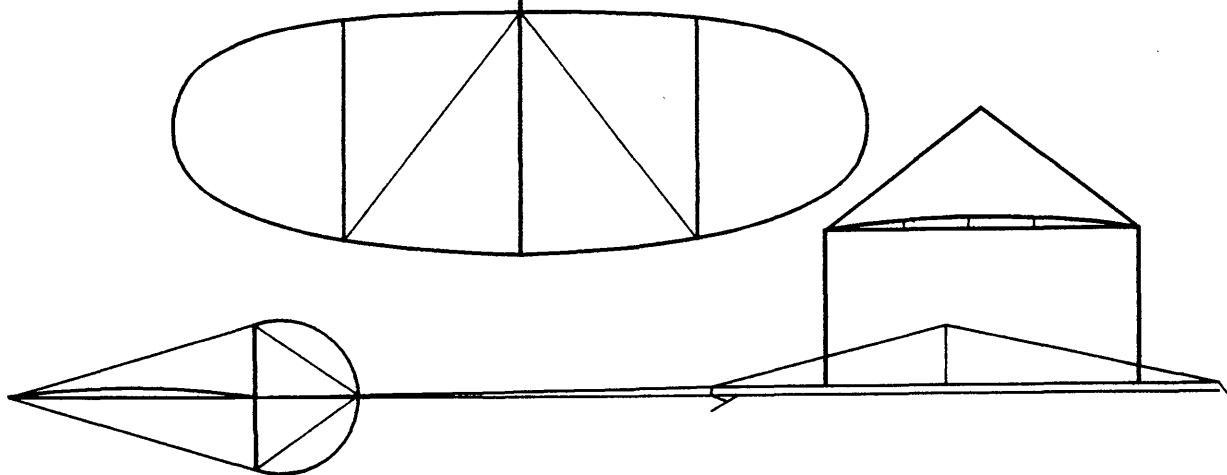
**INDOOR NEWS
AND VIEWS**

ISSUE #89 OCTOBER, 1996



TIME TRAVELER

by Steve Brown



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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 hangar 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 hangar. 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:
Gary Underwood
24 Kinnebec Ct.
Bordentown, NJ
08505

Akron:
Bill Hulbert
174 Castle Blvd.
Akron, OH
44313

Sana Ana:
Bob Randolph
25145 Lauton Ave.
Loma Linda, CA
92354

Tillamook:
Andrew Tagliafico
10039 SW Quail Post Rd.
Portland, OR
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.

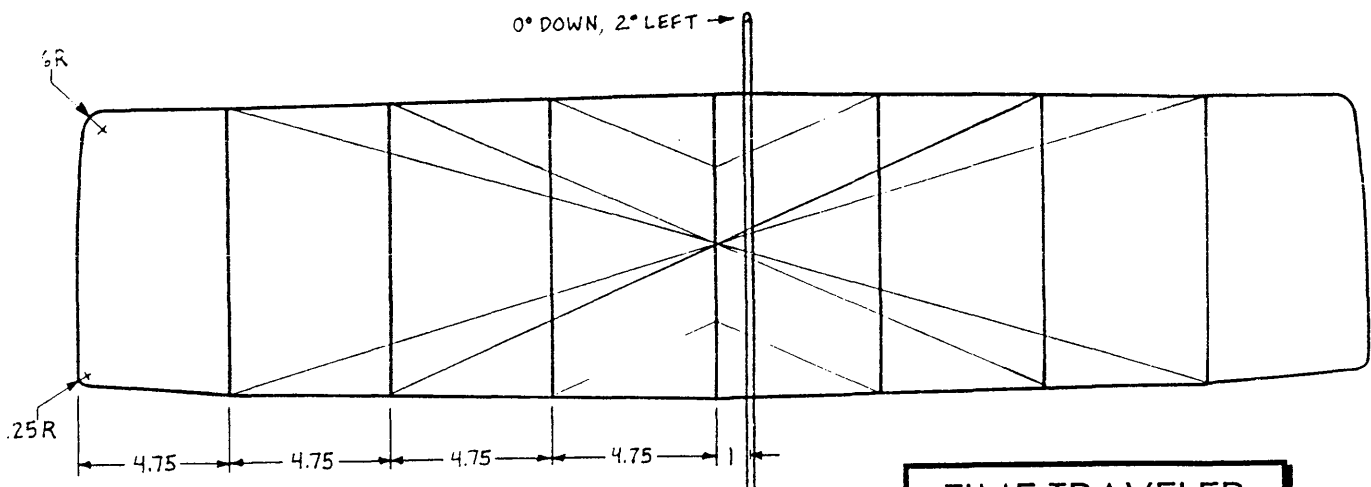
September 1 was warm, 85 degrees and humid at 55%. At Santa Ana, if outside winds don't cause excessive drift, this promised to be excellent flying weather. I expected to spend the day adjusting the new model and testing prop/power combinations. After three 1/4 motor flights to size the rubber, I was 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'.

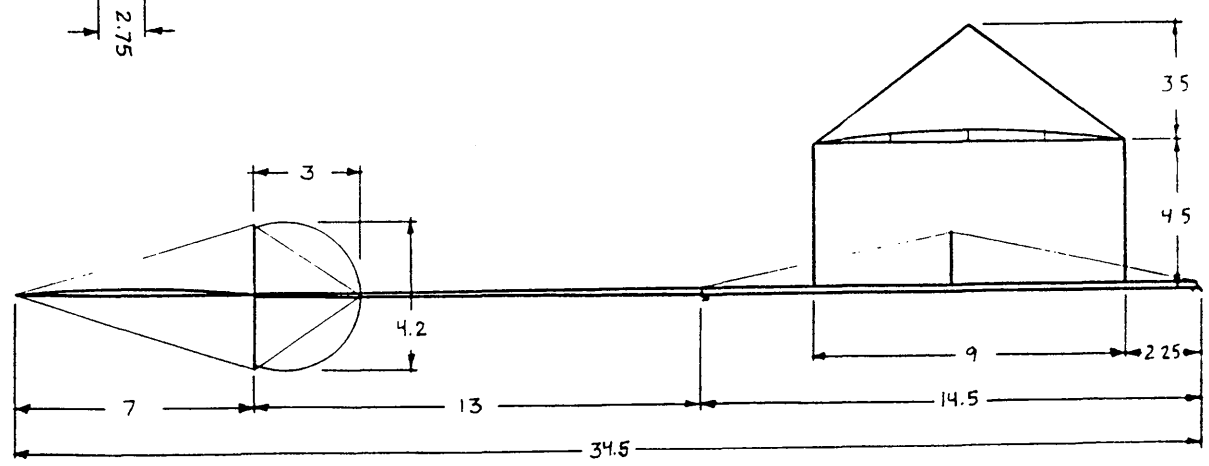
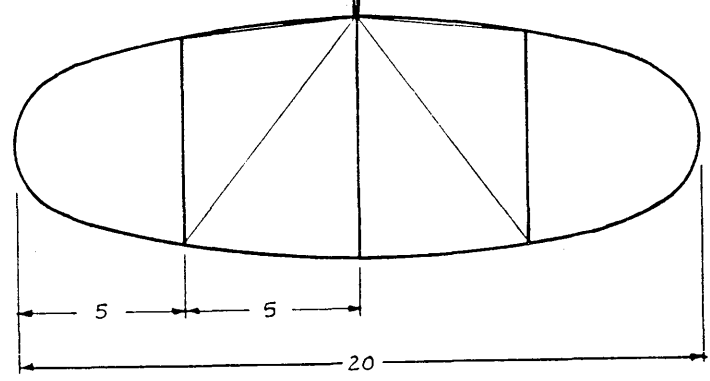
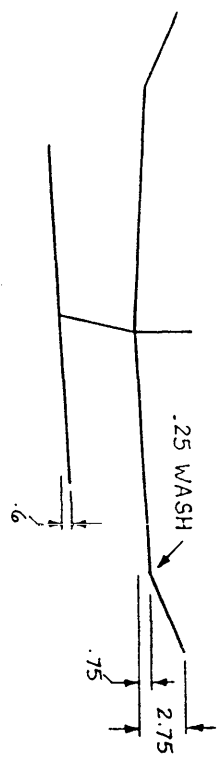
At about 45 minutes the model was cruising above the catwalks (137') and was drifting toward the side of the building. A short steer returned the model to the center, after which it began drifting to the opposite

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

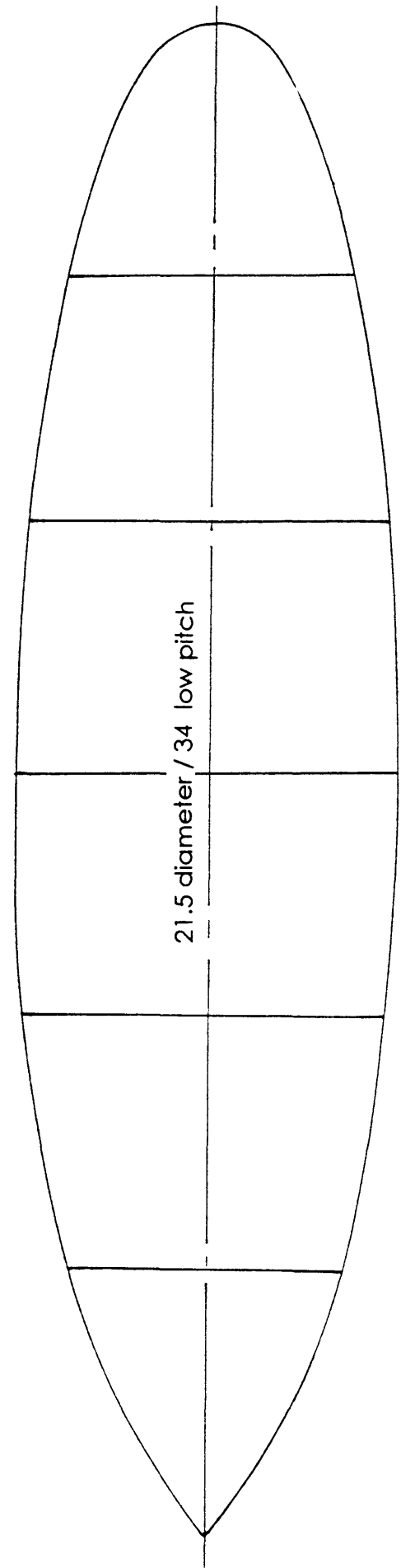
tube		.008	3.9 lb.	.230 i.d. → .130 i.d.
		(2) .003	boron	6, 12 o'clock

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.I.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 FID Championships. On the good side, a high point of the Opening Ceremonies was the introduction of the many FID 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 FID 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 without 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 become 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 F1D 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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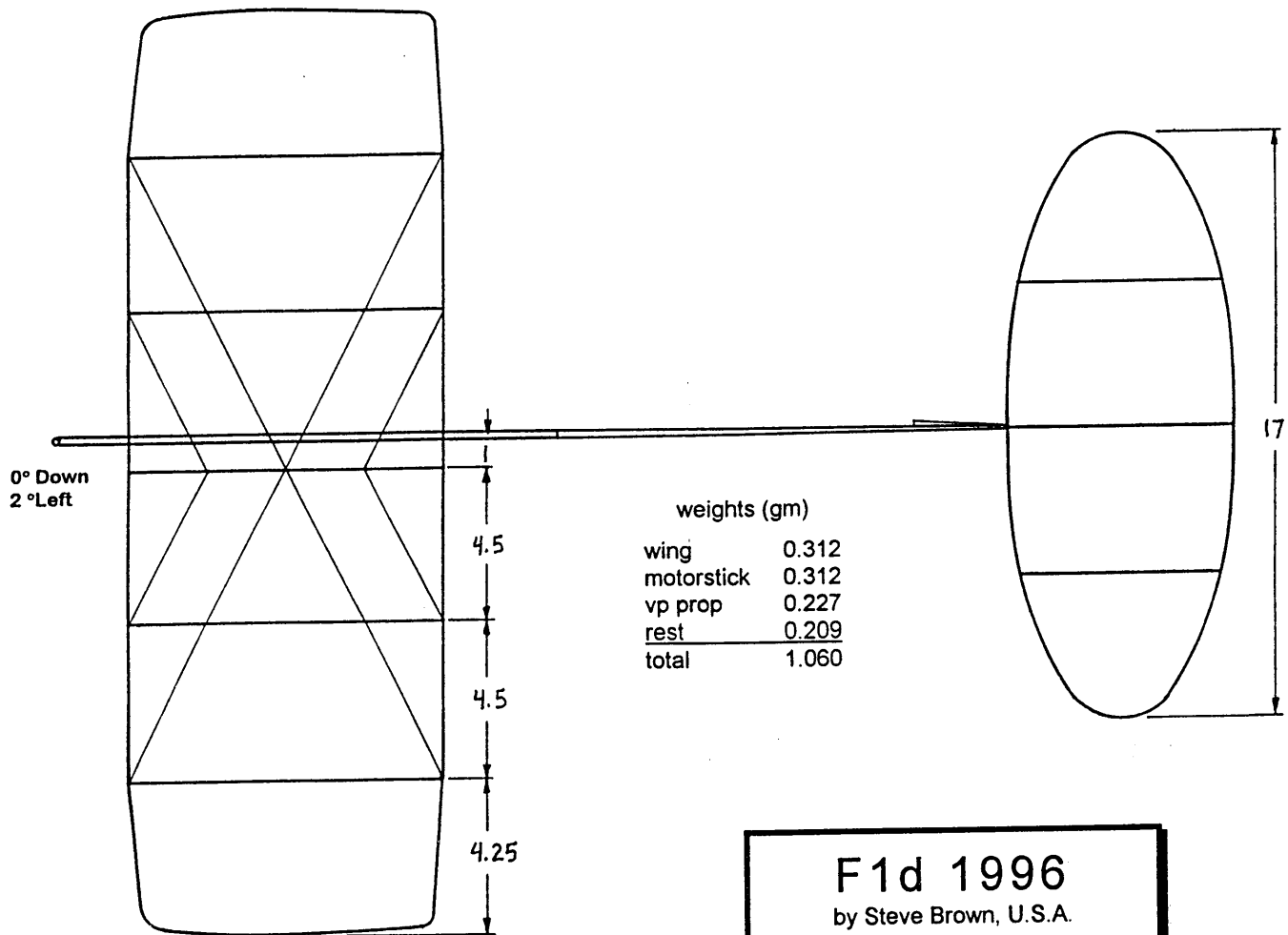
1996 Indoor WC - Individual

#	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

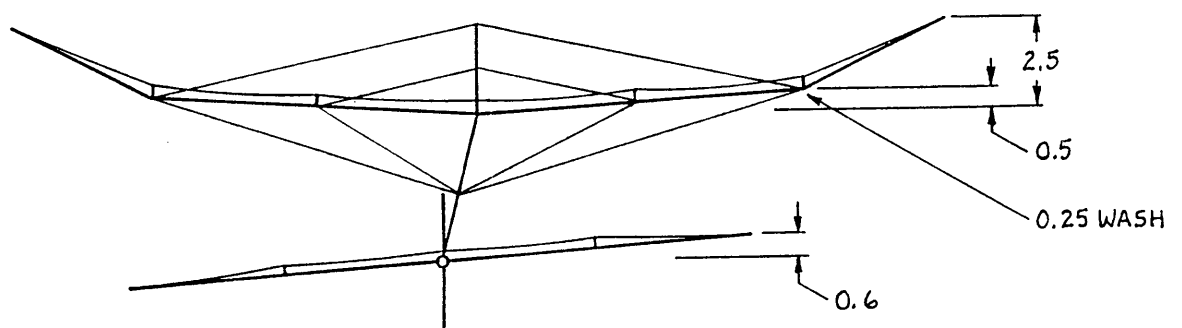
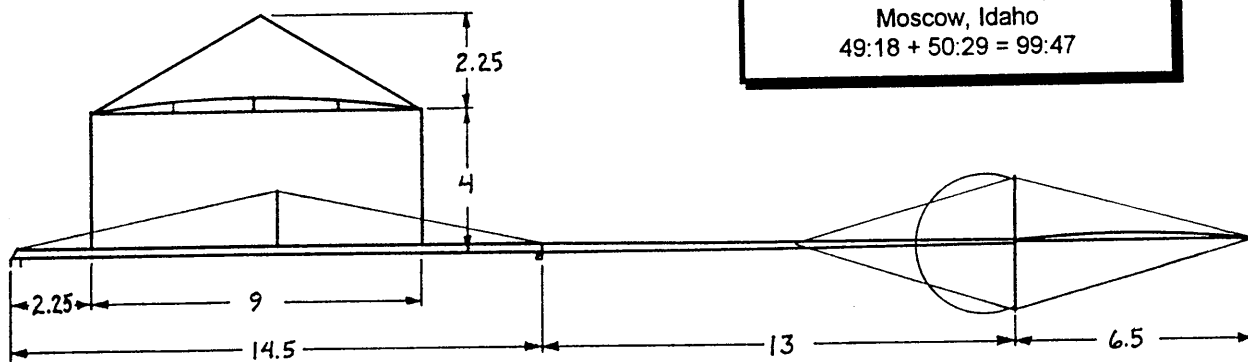
1996 Indoor WC - Team

#	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



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

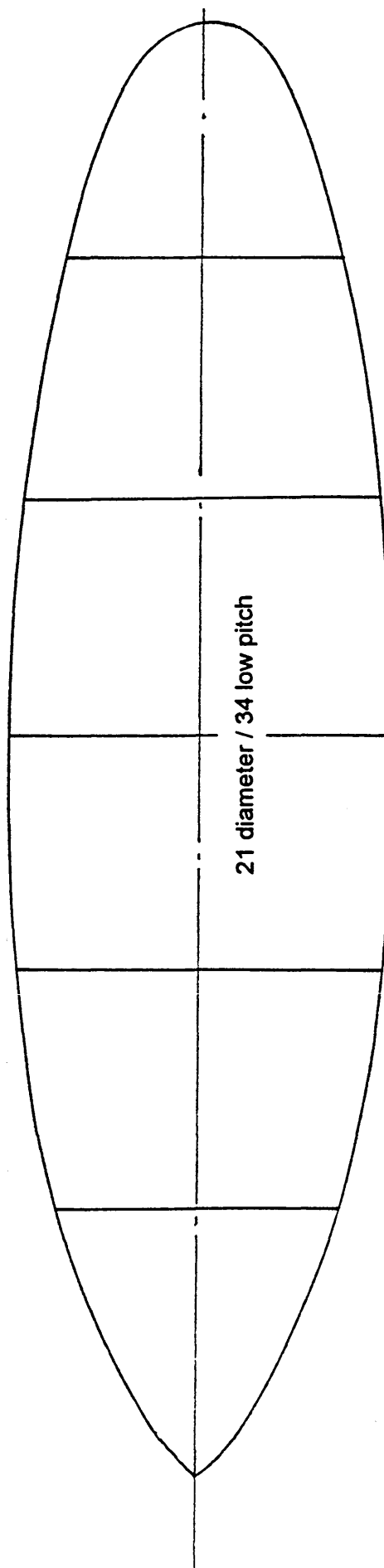
tube	.008	3.9 lb.	.230 i.d. → .160 i.d.
------	------	---------	-----------------------

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



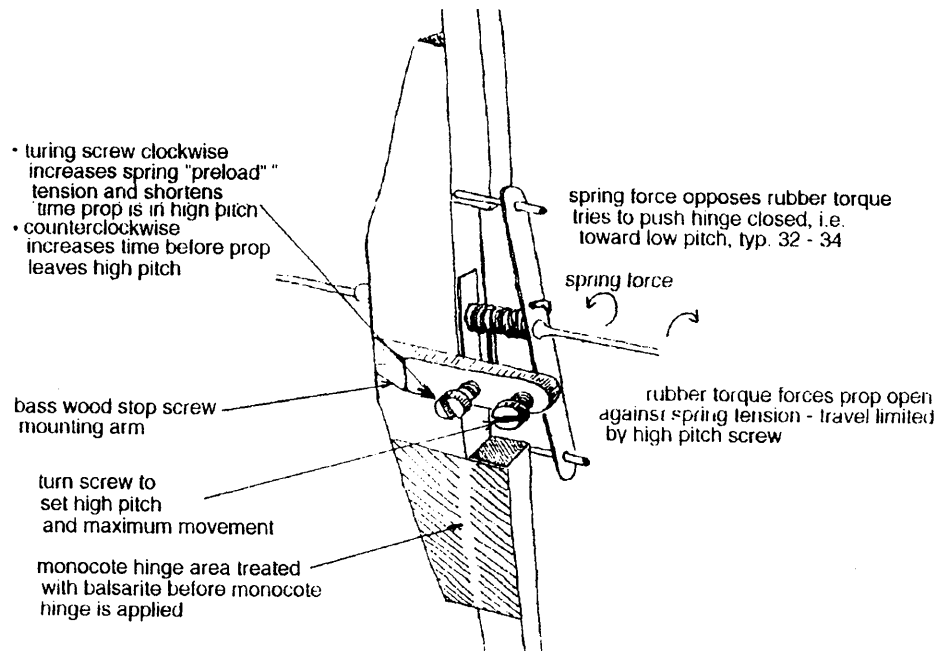
CONSTRUCTION OF VARIABLE PITCH PROPS FOR INDOOR MODELS

Construction by Steve Brown

Illustrations by Steve Gardner

CURRENT F1d VP PROP CONSTRUCTION

low pitch built into prop when hinge is
fully closed. adjustments are
high pitch position and
torque load at high pitch



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.

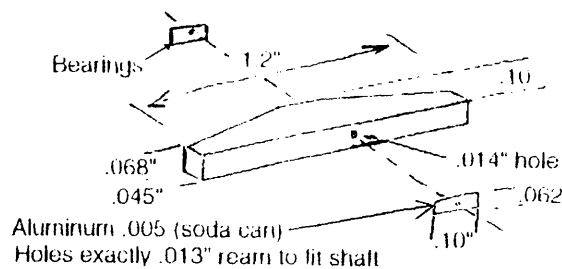


FIG.1

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.

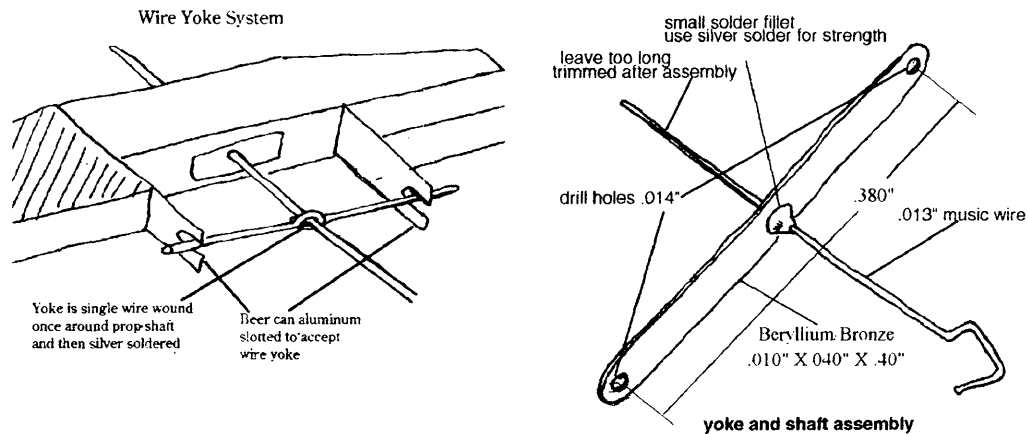


FIG. 2

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.

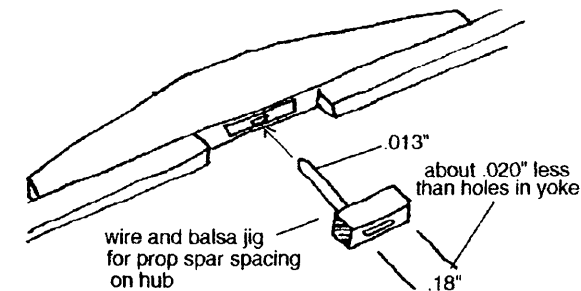


FIG.3

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

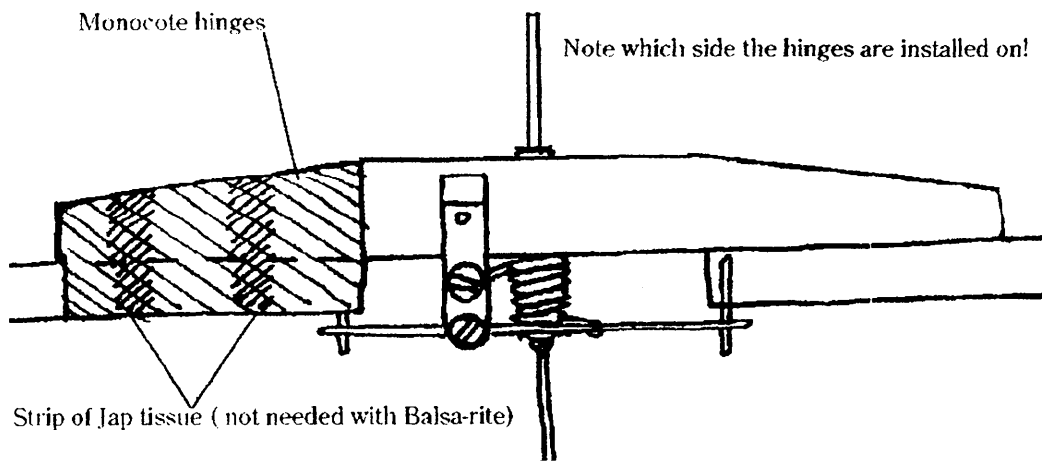


FIG. 4

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.

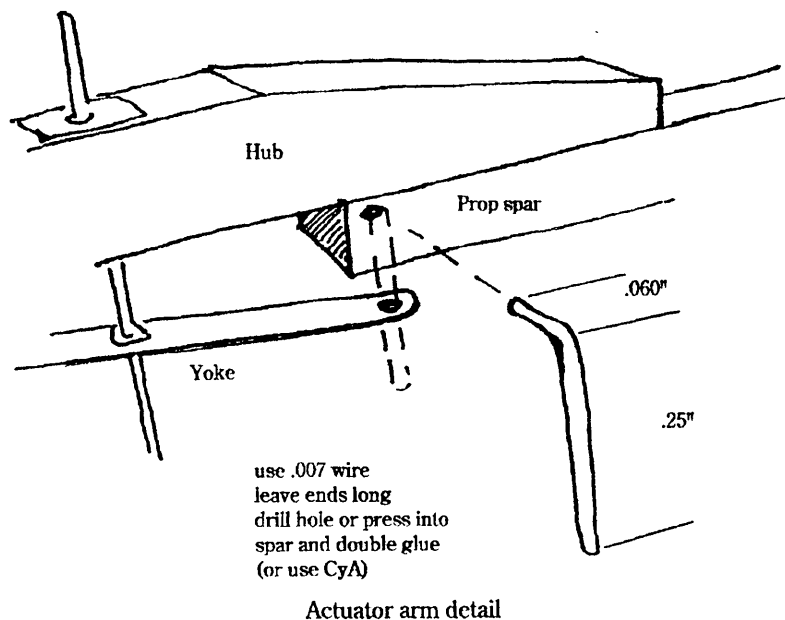


FIG. 5

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 holes 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.

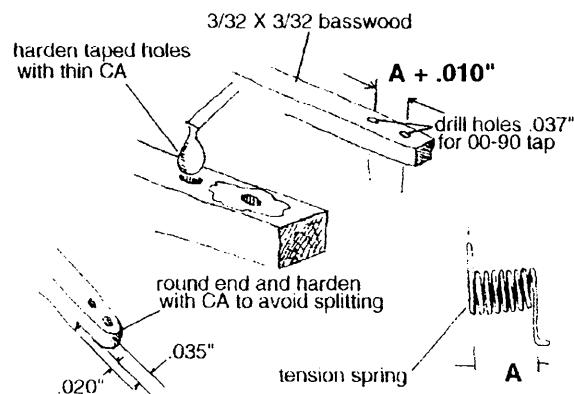


FIG. 6

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

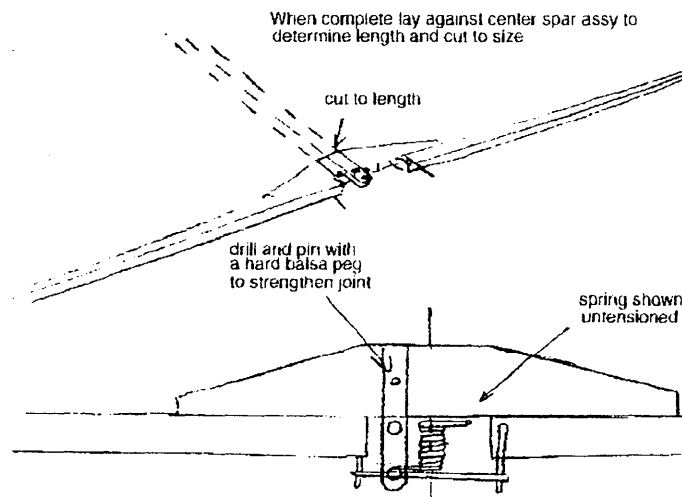


FIG. 7

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.

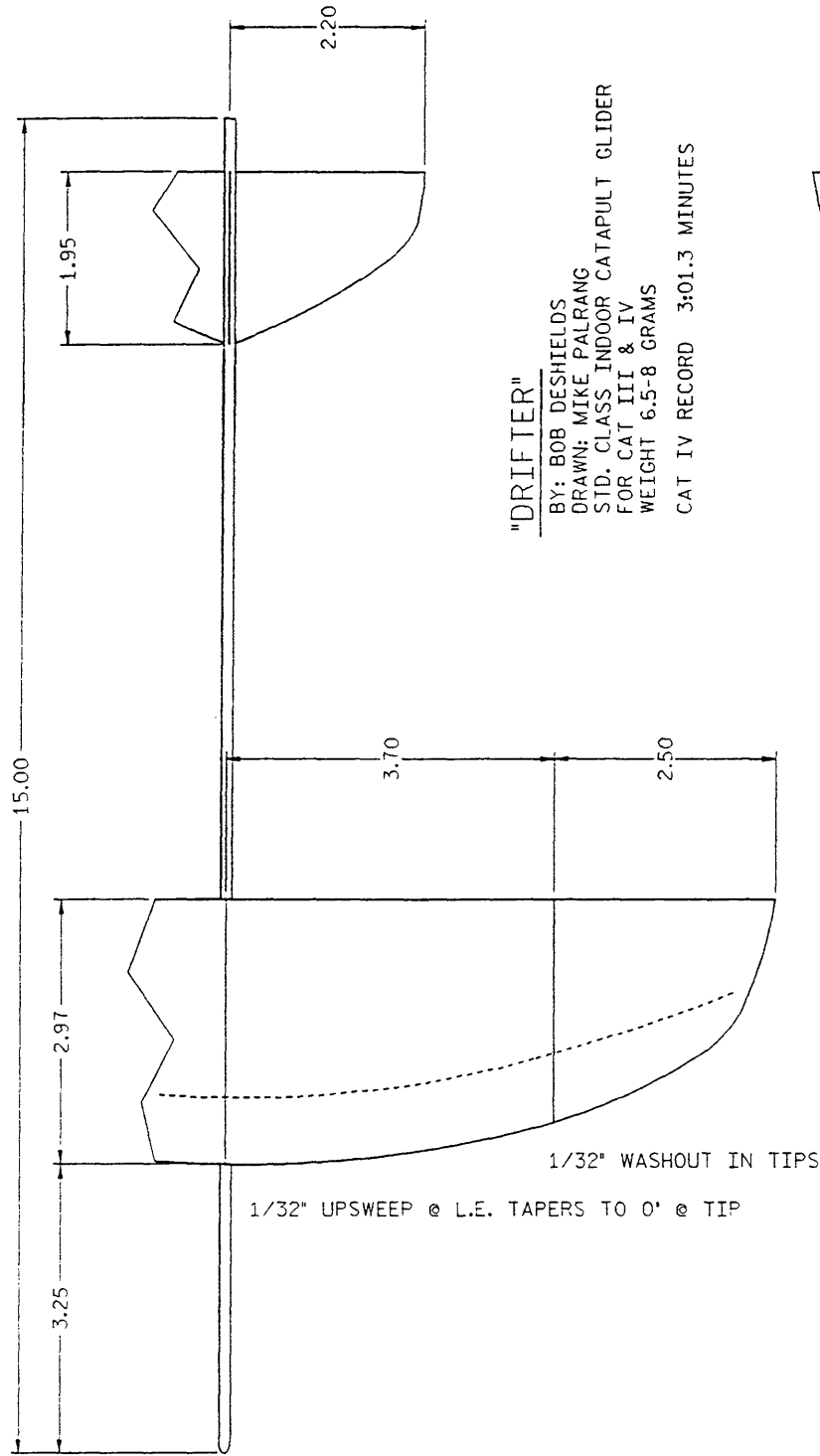
9.

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

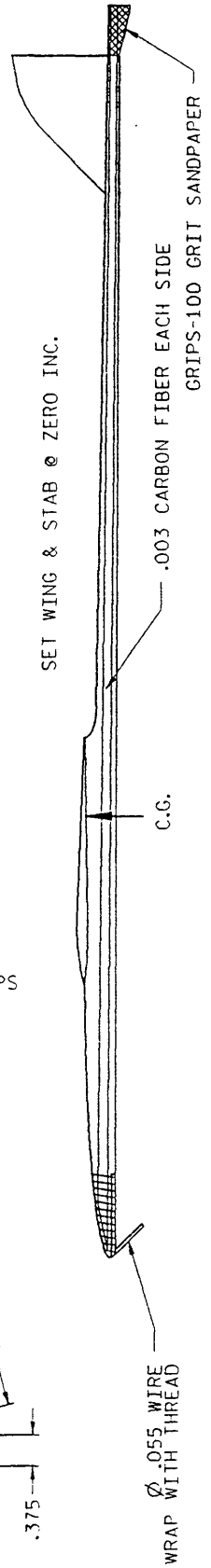
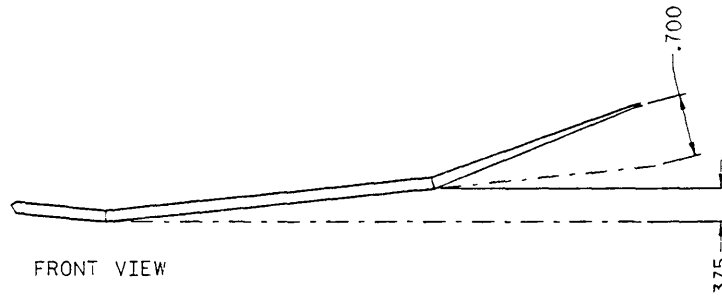
WING 4.0 # 1/8 THK. C-GRAIN
 FUSE 6-8 # 1/8 X 7/16 A-GRAIN
 STAB 4.0 # 1/32 THK. C-GRAIN (SAND THIN)
 RUDDER 4.0 # .025 THK. C-GRAIN

WING FINISHED WITH 2 COATS
 SANDING SEALER FOLLOWED
 WITH 2 APPLICATIONS OF
 "VISTA" CAR WAX (FOR OTHER
 MILD ABRASIVE CAR WAX)



"DRIFTER"

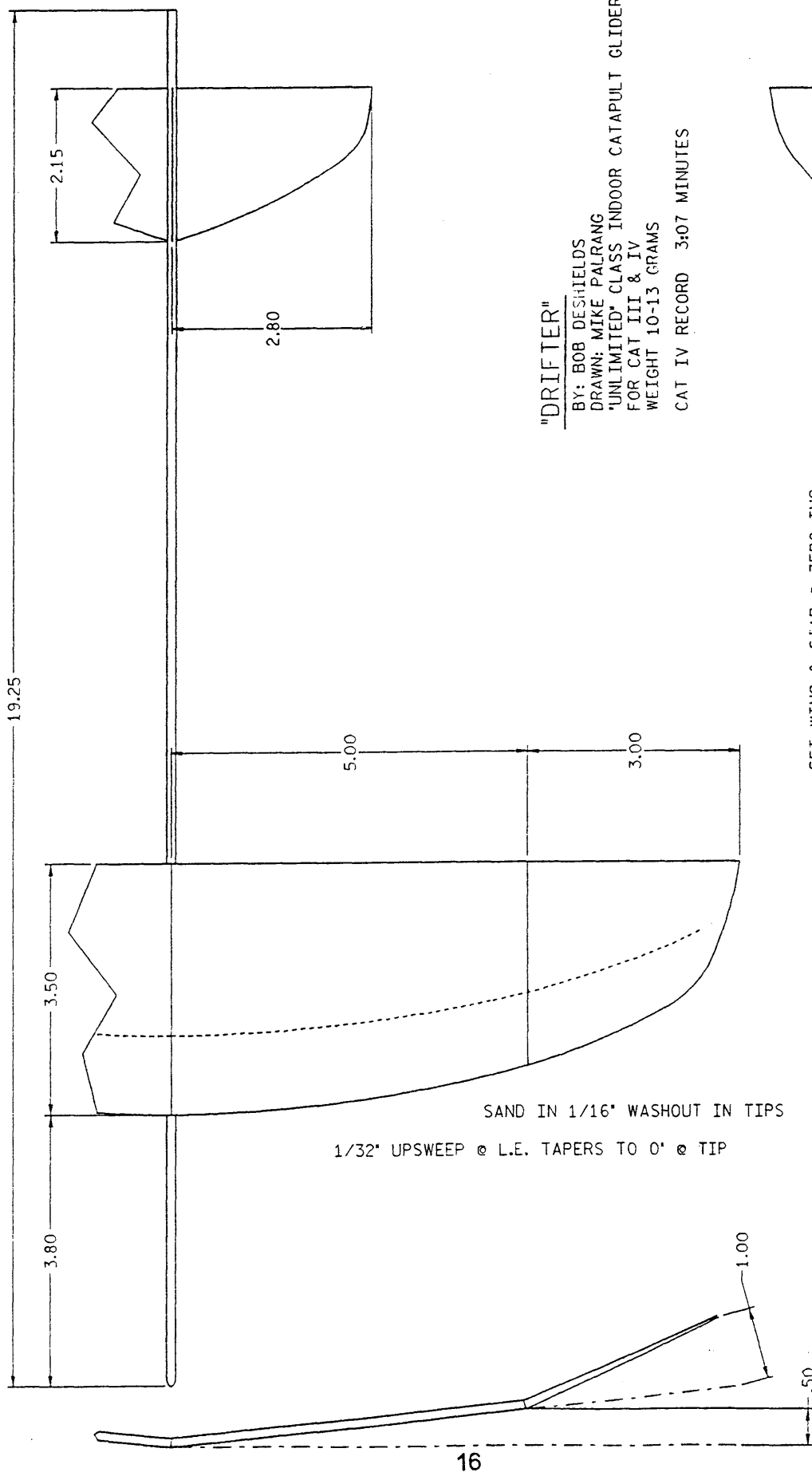
BY: BOB DESHIELDS
 DRAWN: MIKE PALRANG
 STD. CLASS INDOOR CATAPULT GLIDER
 FOR CAT III & IV
 WEIGHT 6.5-8 GRAMS
 CAT IV RECORD 3:01.3 MINUTES



WOOD

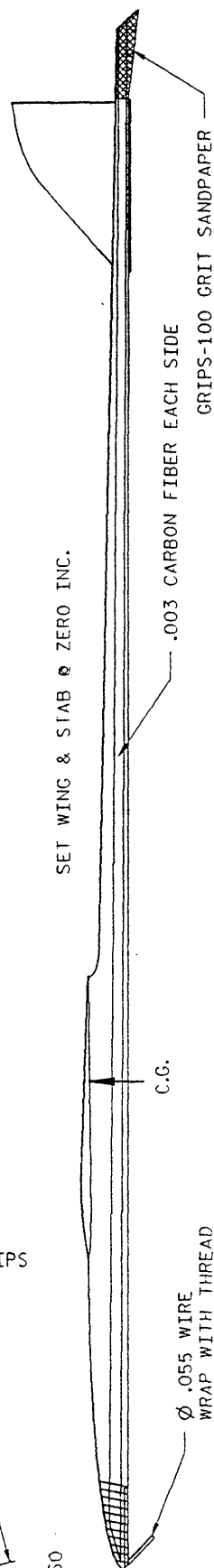
WING 4-6 # 1/8 THK. C-GRAIN
 FUSE 6-8 # 1/8 X 1/2 A-GRAIN
 STAB 4.0 # 1/32 THK. C-GRAIN
 RUDDER 4.0 # 1/32 THK. C-GRAIN

WING FINISHED WITH 2 COATS
 SANDING SEALER FOLLOWED
 WITH 2 APPLICATIONS OF
 "VISTA" CAR WAX FOR OTHER
 MILD ABRASIVE CAR WAX)



"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



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.

screws turned into tapped holes in 1/16 or 3/32 plexiglass or metal until just the very end protrudes

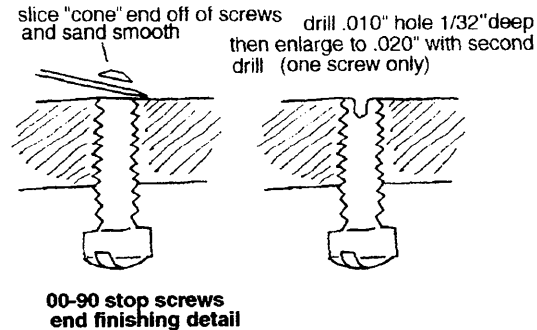


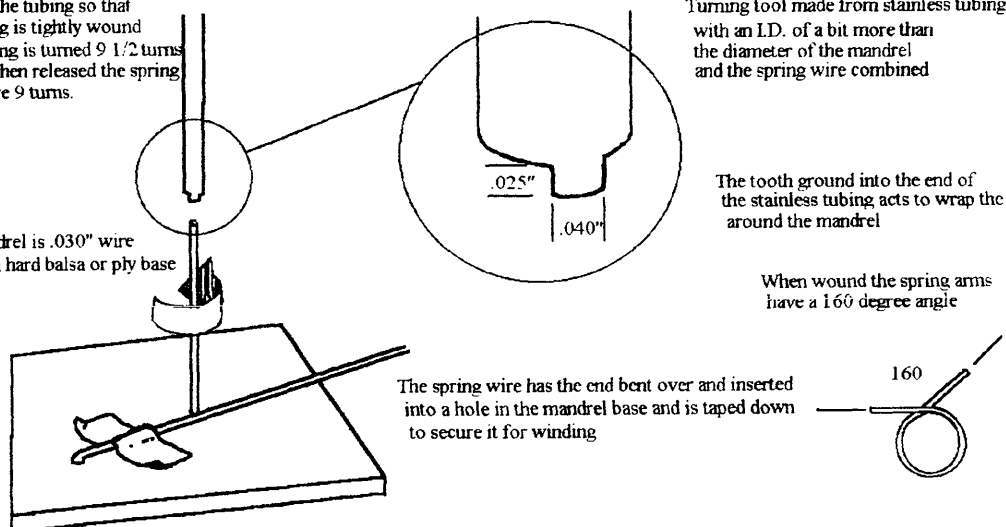
FIG 8

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.

To turn the spring push down while turning the tubing so that the spring is tightly wound. The tubing is turned 9 1/2 turns so that when released the spring will have 9 turns.

The mandrel is .030" wire set into a hard balsa or ply base



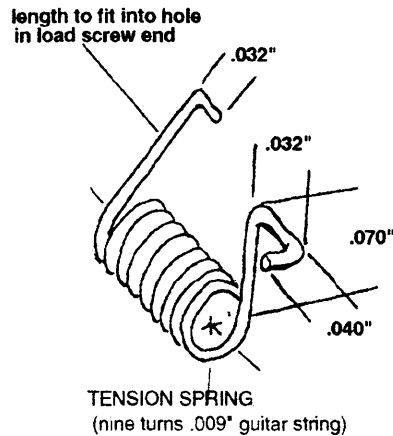


FIG. 9A

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

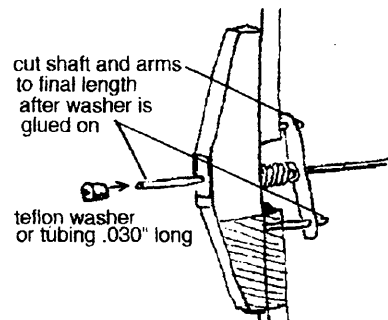


FIG. 10

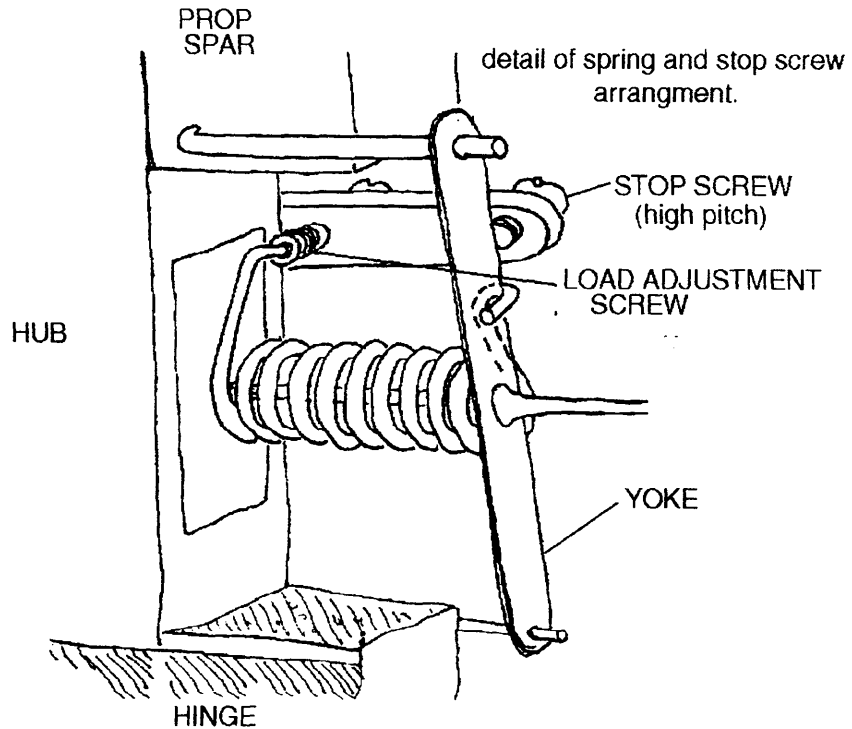
12.

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 hingeline 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 BERRY	: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 BARRY	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									22:11	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											

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*

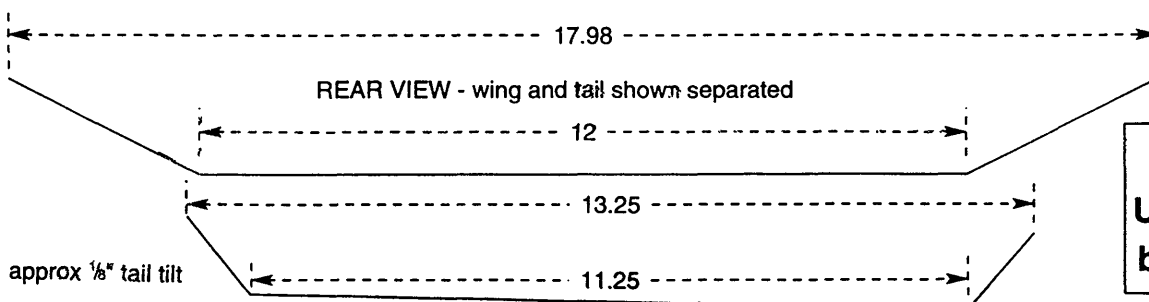
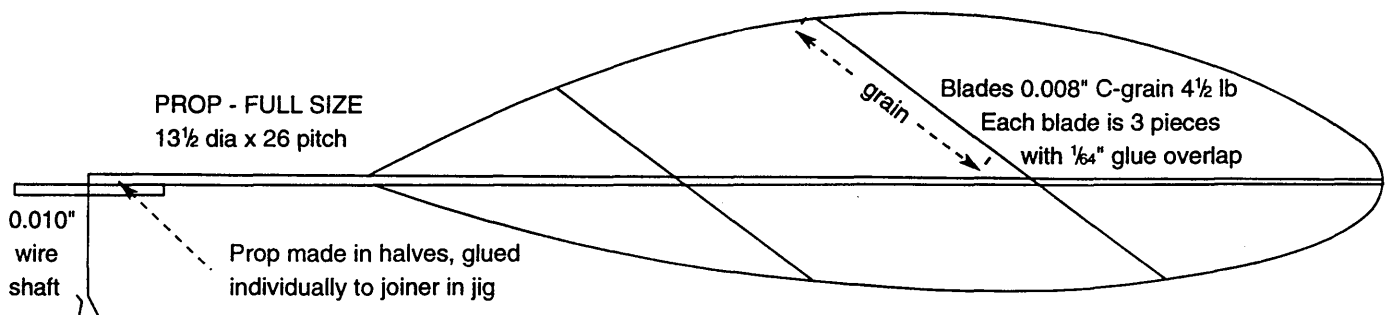
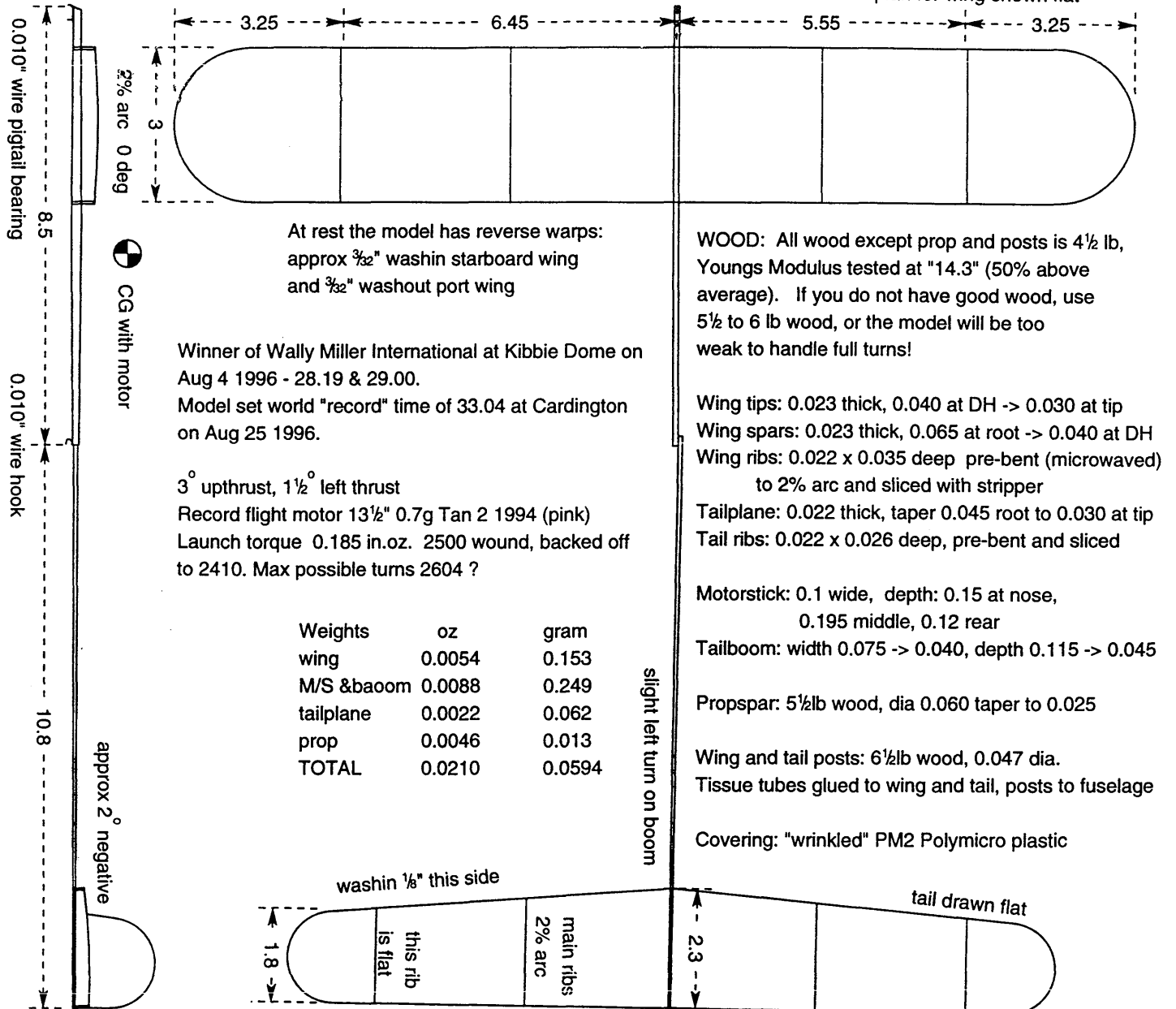
RESULTS

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

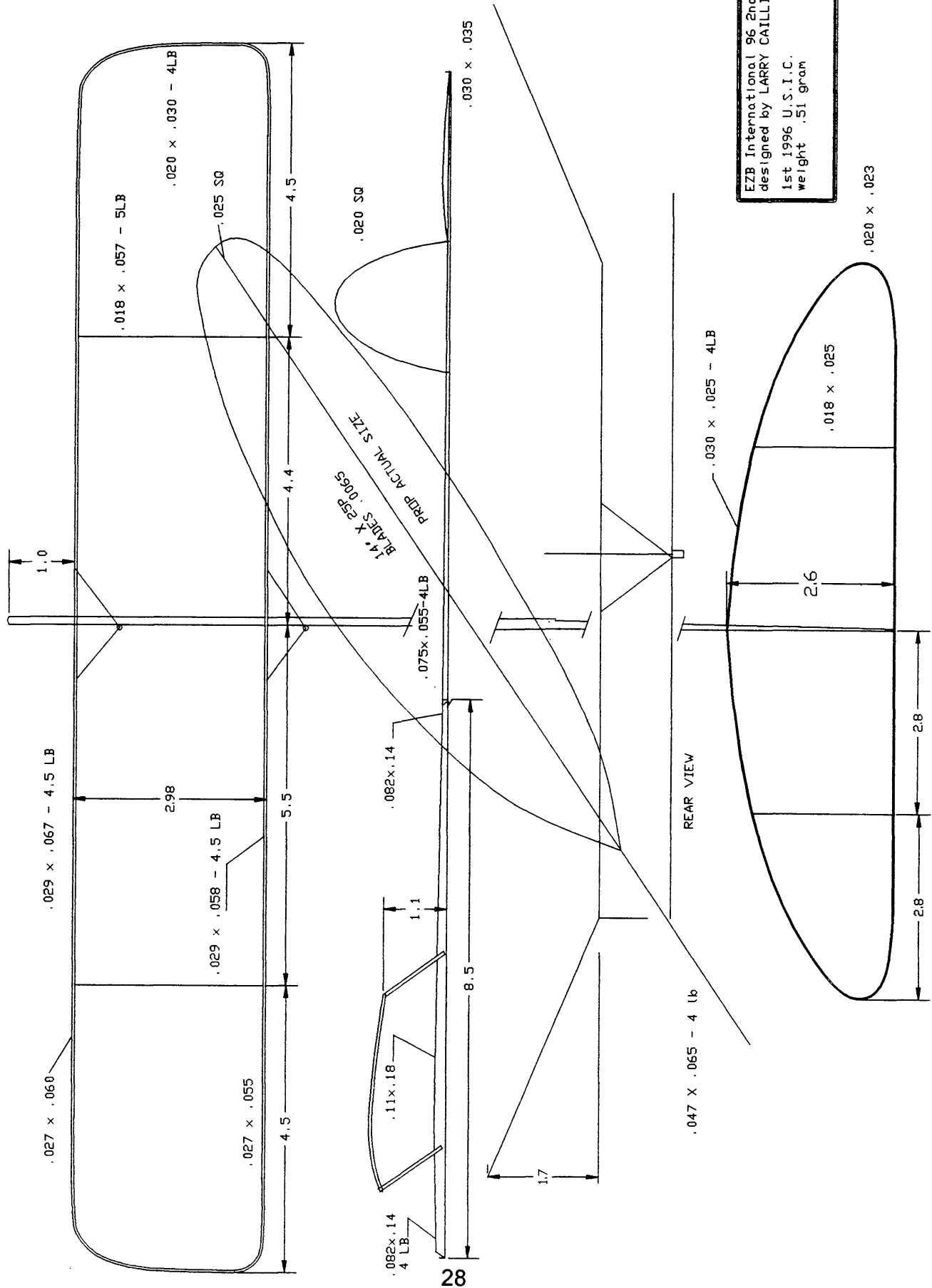
BERRY, ED	17:22	17:23	5:37	13:44	20:38	20:26	20:38	20:26	41:04	19
STEVENS, DARRYL		14:43	16:52	20:44	19:29	19:24	20:44	19:29	40:13	20
YATES, DAVE	17:21	18:00	19:24	18:47	17:26	20:27	20:27	19:24	39:51	21
HOFFMAN, EARL	18:48	06		18:47	20:32	15:28	20:32	18:48	39:20	22
WILLIAM, WARREN	16:13	00:06	04:50	02:42	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

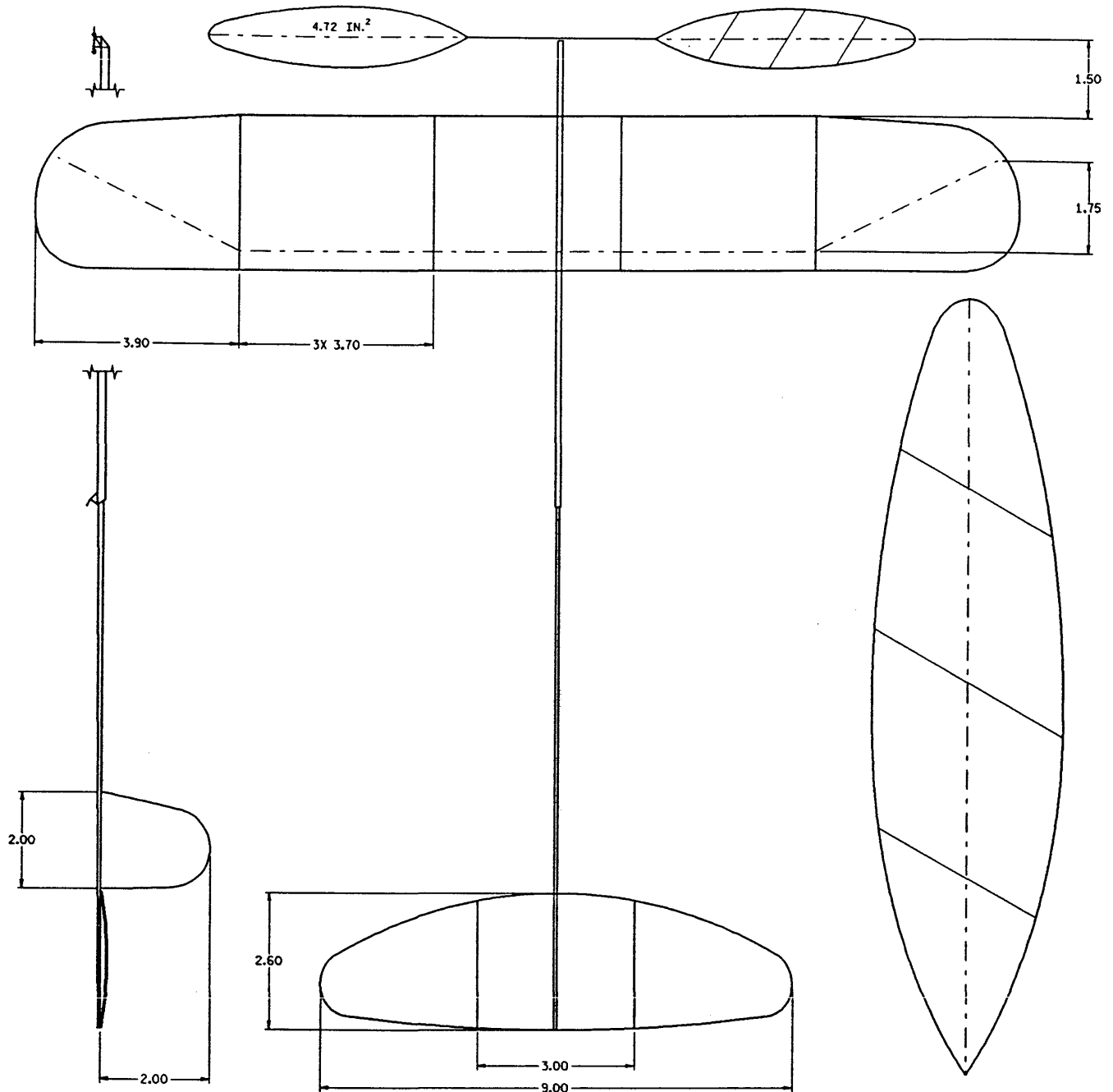
dimensions and plan for wing shown flat



**Miller Lite
USA rules EZB
by Laurie Barr**



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 7/16 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



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
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EZB

CAT I	2/11/96	21:44	Larry Coslick
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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
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Helicopter

CAT IV	8/2/96	12:00	Larry Coslick
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JUNIOR CLASS

Helicopter

Cat IV	8/2/96	5:47	Nick Leonard Jr.
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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

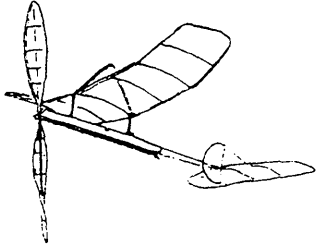
Propeller Wood Prop, 7" dia. max.
Minimum Weight (0.43 gms)0.015 ounces

Flying

Steering 4 Ten Second Steers*
Attempt 15 Seconds or more*

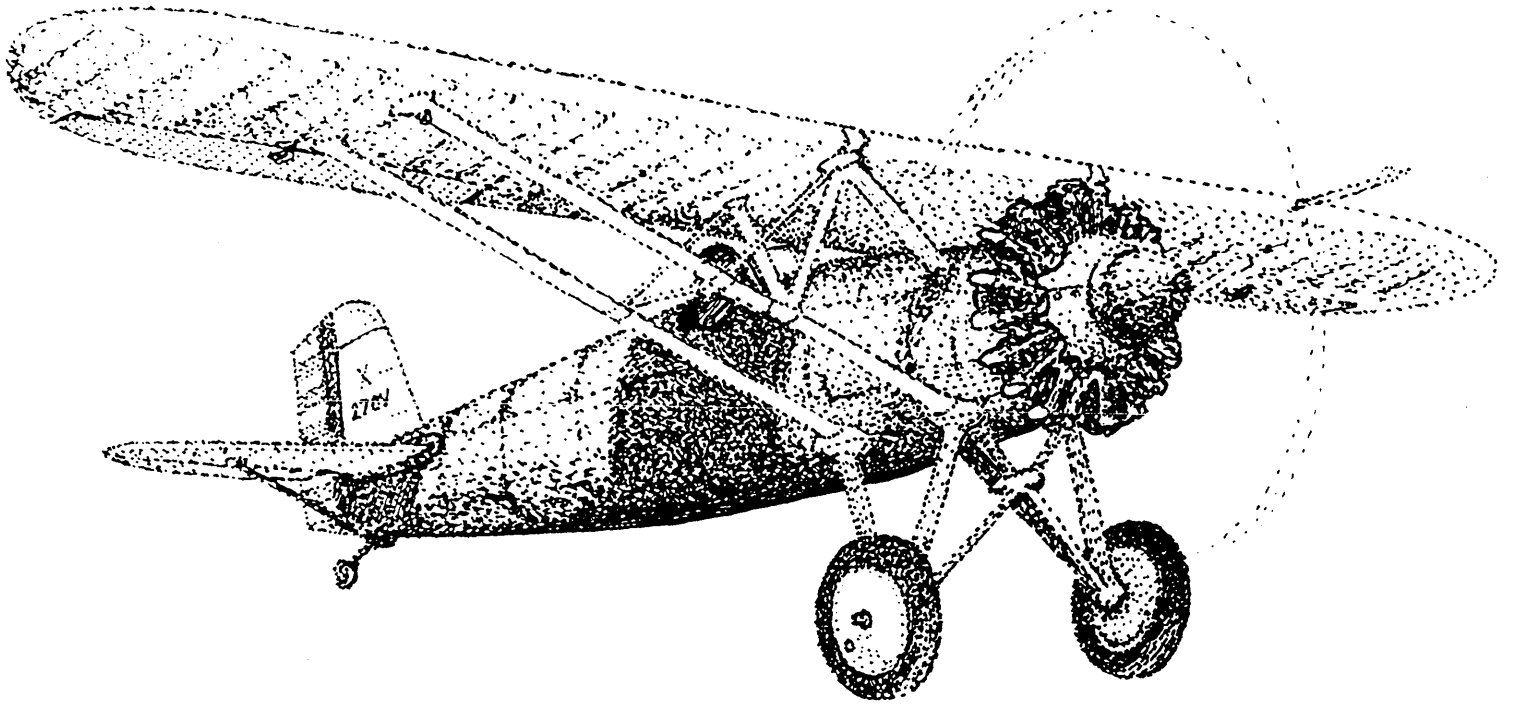
*Special rules for very small rooms only!
(Living Room flying.)

INVA



Indoor News and Views

ISSUE #90 Feb 1997



STEVE
GARDNER

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

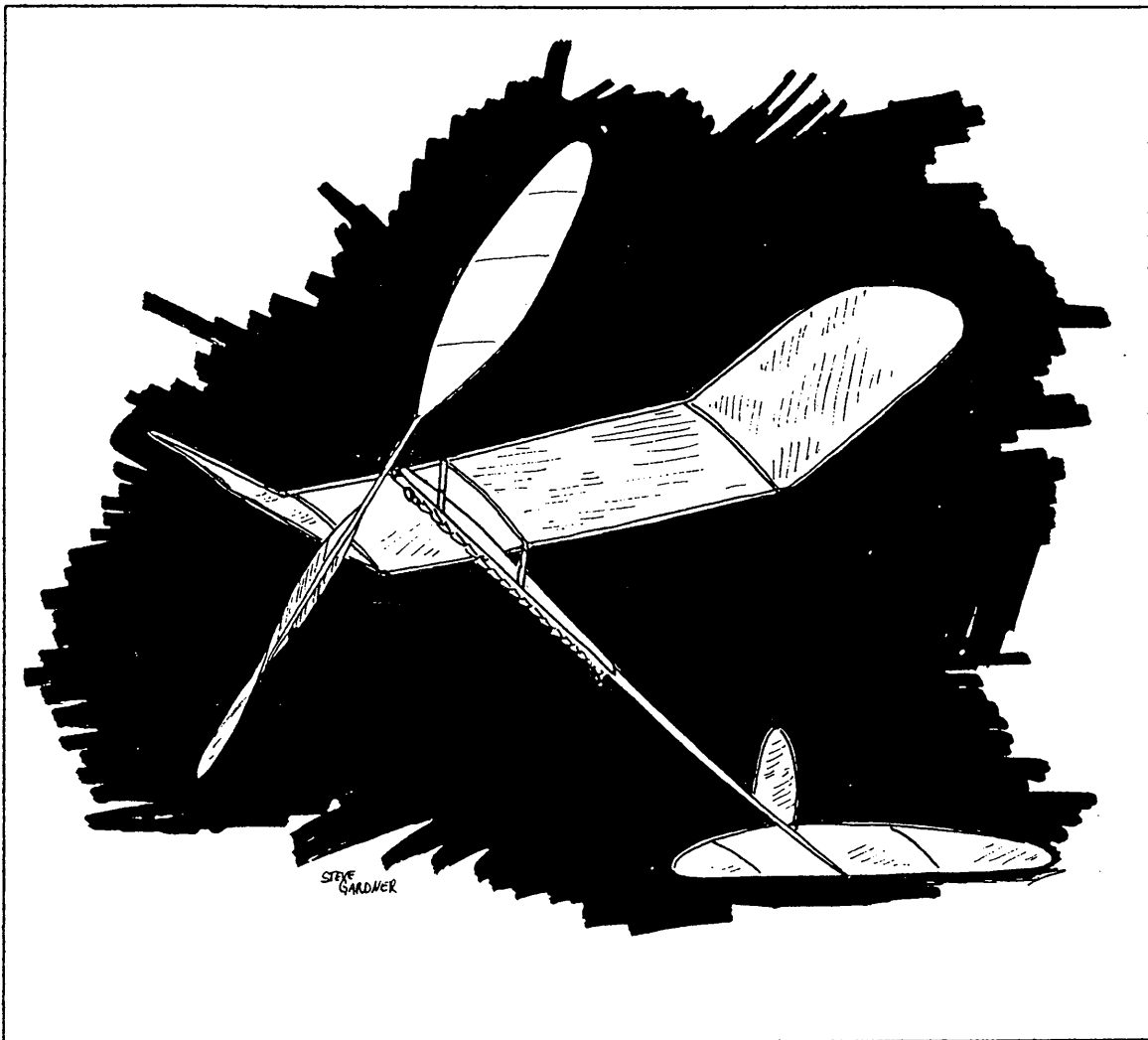
We are asking our subscribers to join and support the NFFS. The NFFS is instrumental in obtaining the Johnson City site for the Indoor National Championships. The NFFS also supports indoor free flight with coverage in their magazine. In recent months the NFFS has had increasing costs which need to be covered so that they can continue to champion our cause. If you are not a subscriber to the NFFS magazine, we encourage you to subscribe. If you are already a subscriber, consider making a donation to help this worthwhile organization. Clubs can get involved and really make a difference.

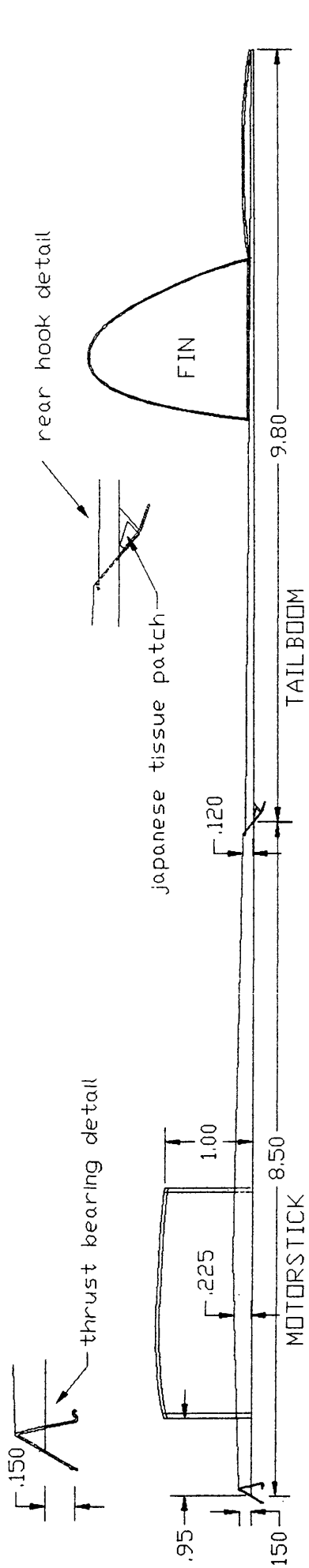
NFFS MEMBERSHIP AND RENEWAL APPLICATION	
 <div style="float: right; border: 1px solid black; padding: 2px;"> Make checks payable to: National Free Flight Society </div> <div style="clear: both;"></div>	
NFFS Mail to: NFFS 3317 Pine Timbers Drive Johnson City, TN 37604-1404	
Dues include an annual fee of \$.50 for membership in the National Free Flight Society. The balance of the dues is for subscription to <i>Free Flight</i> , 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 \$450.00 Non-US Residents \$500.00	
Include payment in US dollars and this form: New Member <input type="checkbox"/> Renewal <input type="checkbox"/> Address change <input type="checkbox"/> Current expiration date: Mo. Yr.	
Name	AMA # (US only)
Address	Telephone # (US only)
City, State	Zip
Send <i>all</i> renewals, changes-of-address, new applications, and membership questions to the Membership Office.	

Hobby Shop EZB

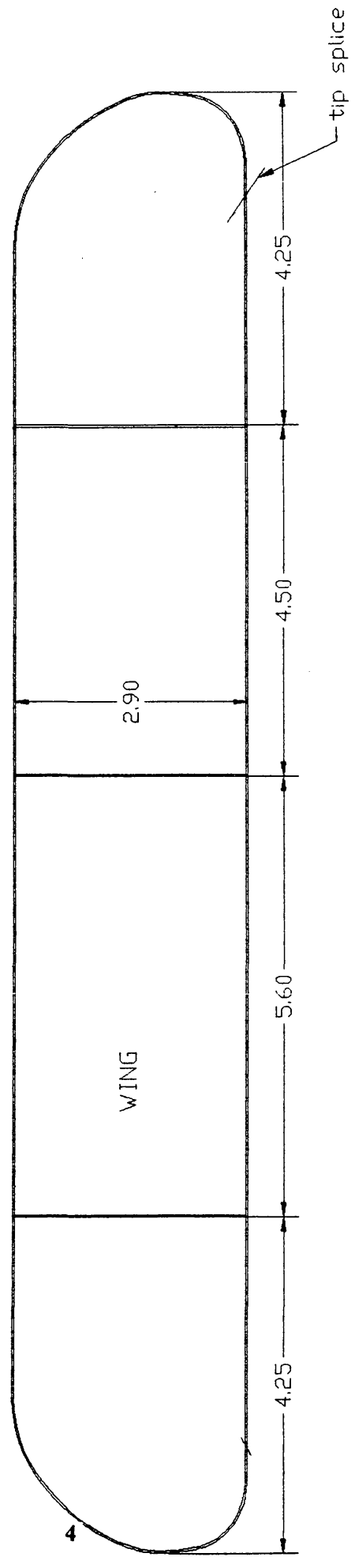
by Larry Coslick
Illustrated by Steve Gardner

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.



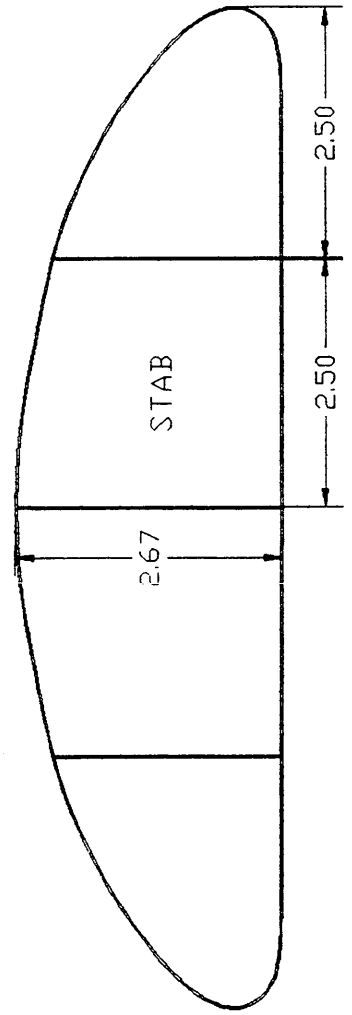


covering is polymicro

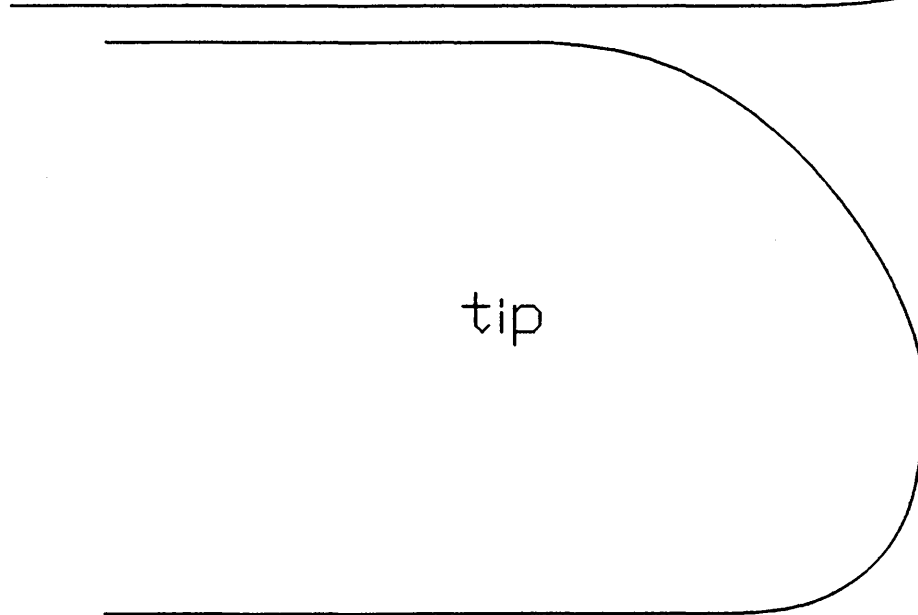
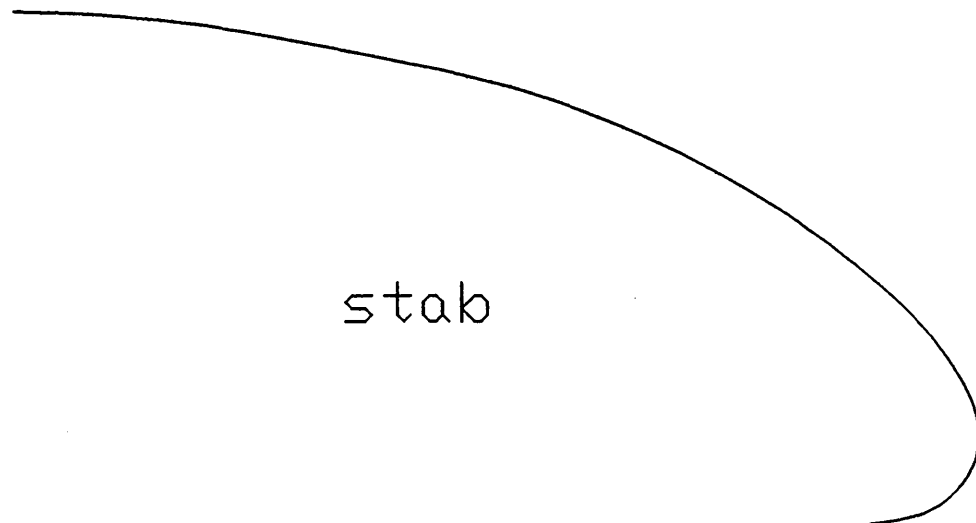
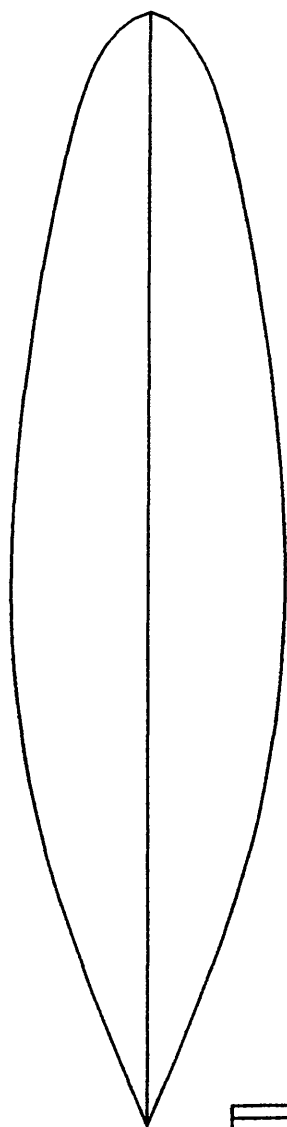


Hobbyshopper

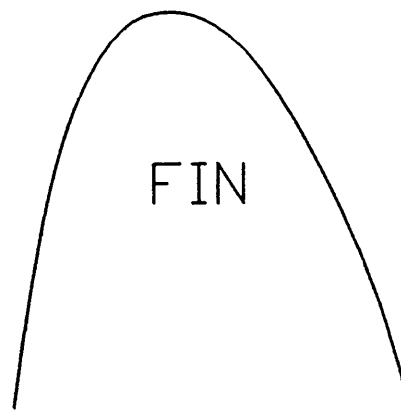
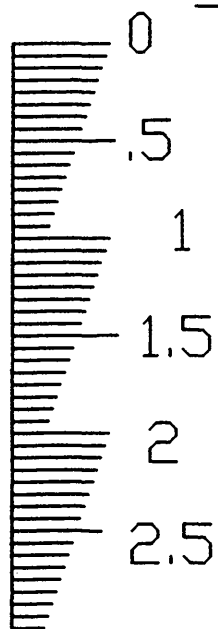
Designed by:
Larry Coslick
Drawn by:
Steve Gardner
1-18-97



HOBBY SHOP EZB



deflection
scale

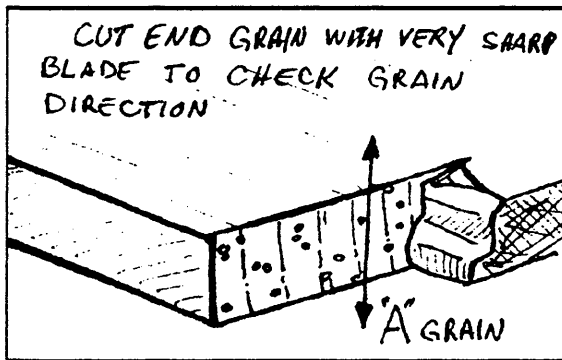


5 Full Size Outlines

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

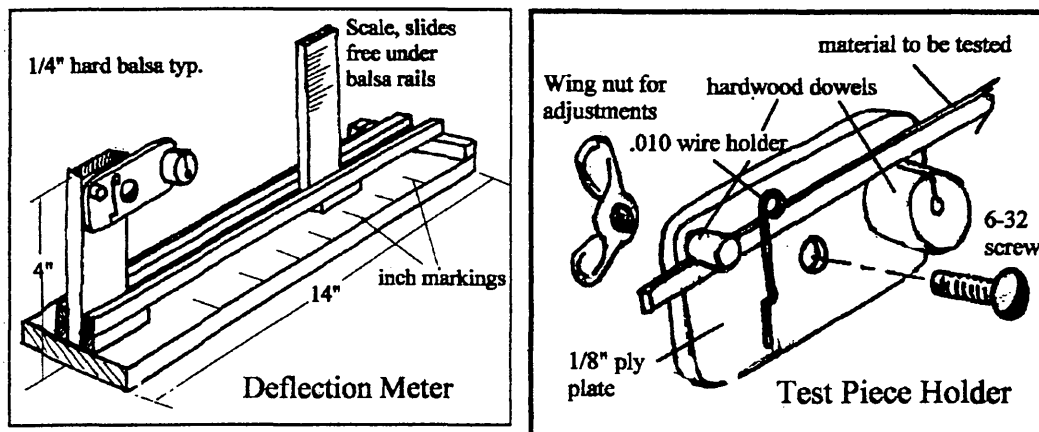


piece before you buy it. To check the density of a piece of wood first weight the piece to find its weight in grams. Then find its volume by multiplying its thickness by its width, and then multiplying that number by its length, in inches. We are mixing units here, but grams (metric) are easier to use 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.



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

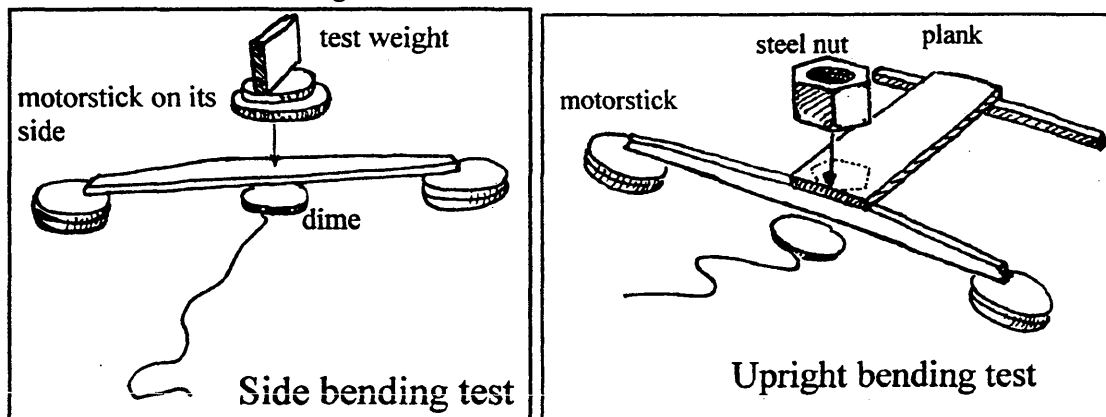
MOTOR STICK ————— 8.5" ————— 4.5# — AB GRAIN ————— .185 GR.

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 model's 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.

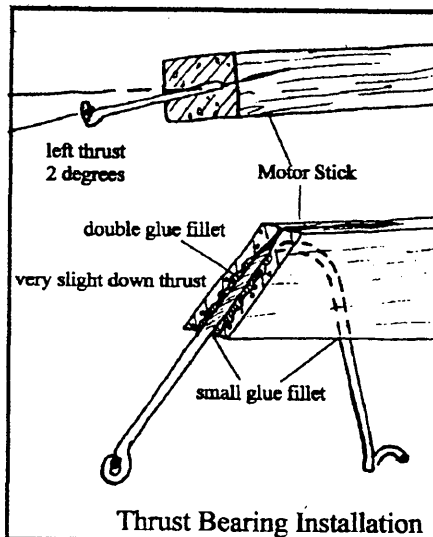
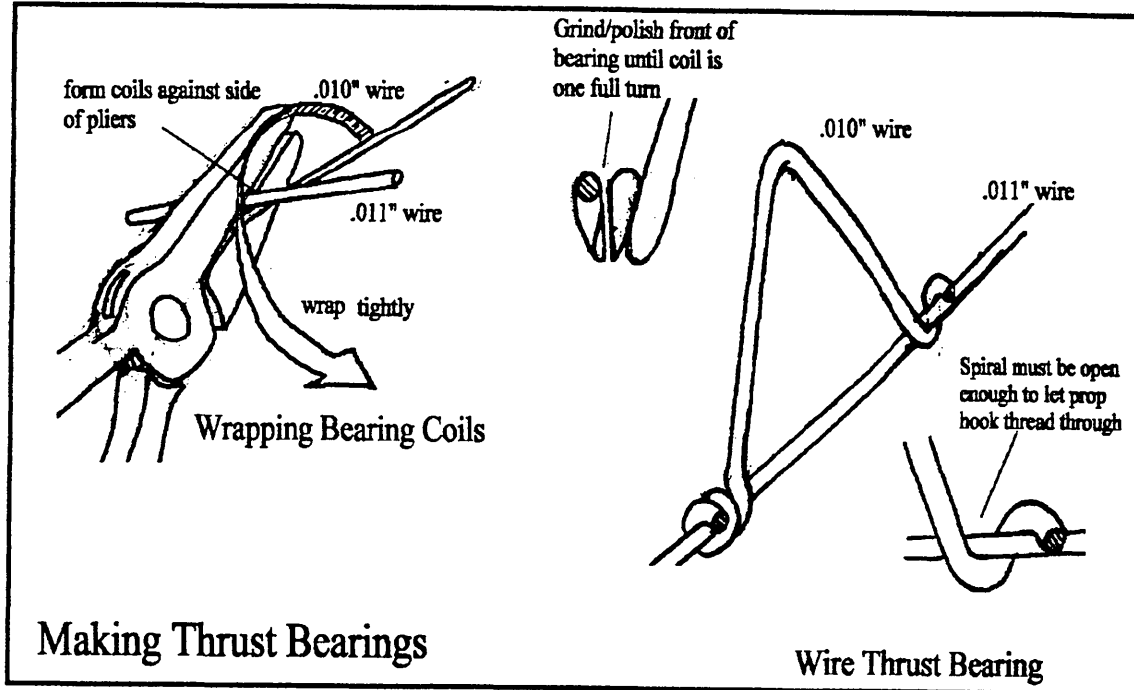
TESTING—Use any flat, hard surface to make this test. Place the motor stick flat on its right side across two sets of pennies with each end of the motor stick resting exactly on the center of one of the penny sets. Turn the penny sets to where the .12" thick area is under the end of the motor stick. 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

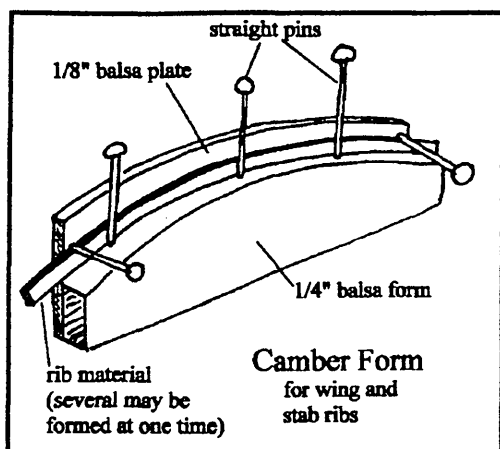
STAB CONSTRUCTION

PROJECTED WEIGHT —————.05 GR.
 OUTLINE —————.025" X .027" 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.

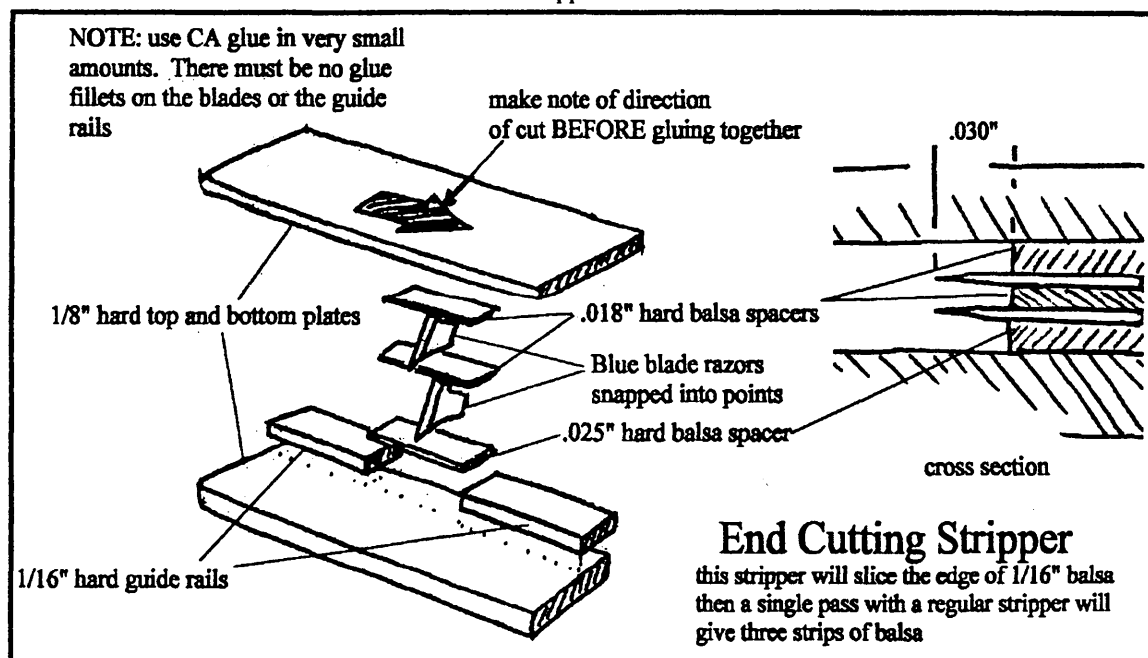
FIN —————.025" X .025" ————— 5.0 #

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.

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.



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 Joshi 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.

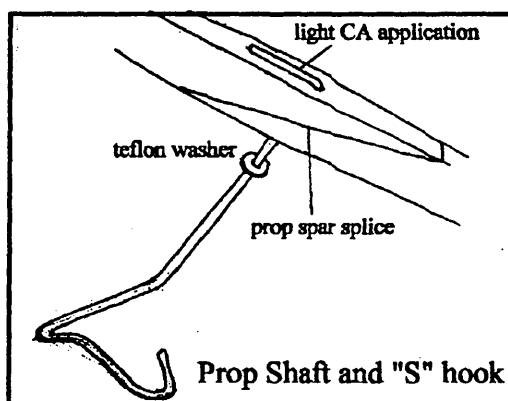
Paper tubes - Cut another piece of 1/32" X 1/16" balsa to use as a form for the tubes. Cut the tissue or condenser paper into 3/8"X1" pieces. Apply a bit of ambroid glue to one end of the form and place the tissue so that it is ready to wrap. The tissue should extend off the end of the form by about 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

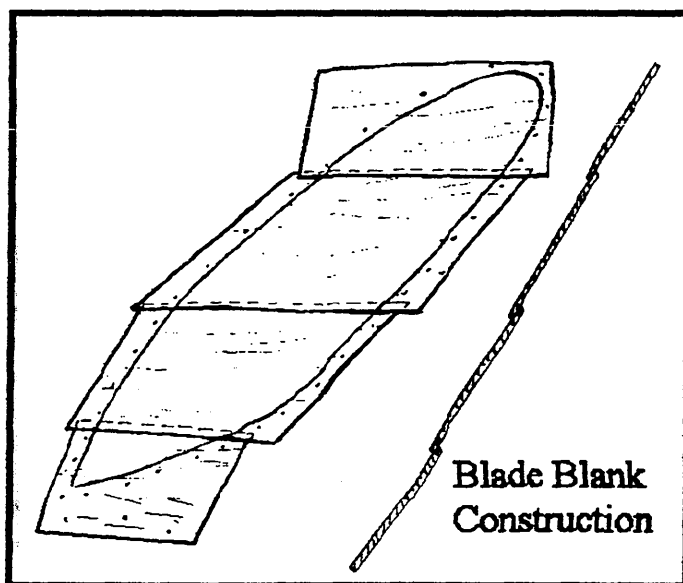
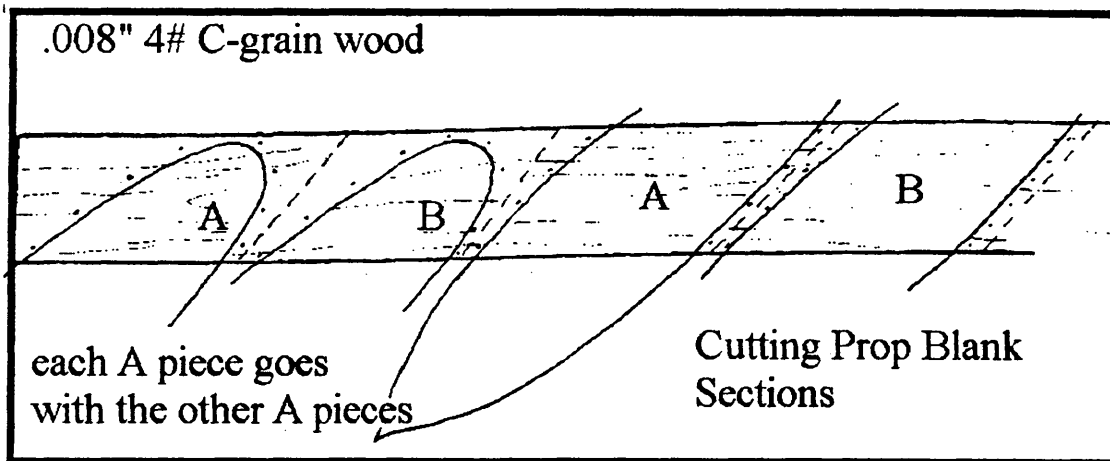


front of the prop spar and push the prop spar back towards the hook. Bend a 90 degree angle in the wire. Leave .2" of wire to glue to the prop spar. CA the wire to the spar using a straight pin to apply the glue. It just takes a small amount of CA so do not overdo it.. Check the spar on the dummy motor stick for trueness. The .2" of wire on top of the prop spar allows for easy handling when truing up the prop spar.

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.

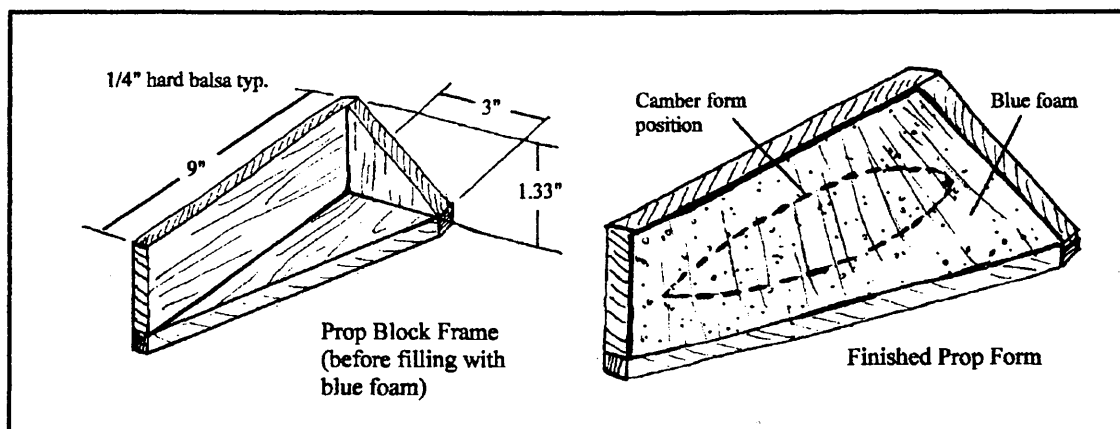
Blade Construction - The blades are assembled on a 4"x10" piece of the green cutting mat from the fabric or stationery department of Wal Mart. My prop blade template is cut from thin aluminum flashing material (available at any hardware store). Diagonal lines are drawn on the template to indicate the 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.

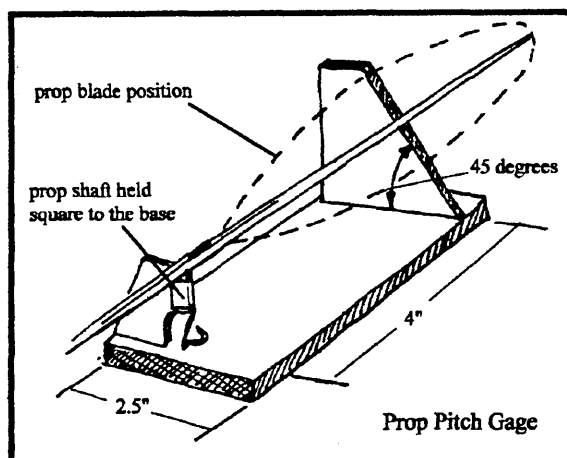
The thin blades need camber to help retain their shape. To get camber into the prop blades a camber form is made from 3/32 soft balsa. The camber form is made by taking the prop blade template and cutting it 1/8" larger than the template. From the hub to about 2/3rds the length of the form the thickness 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

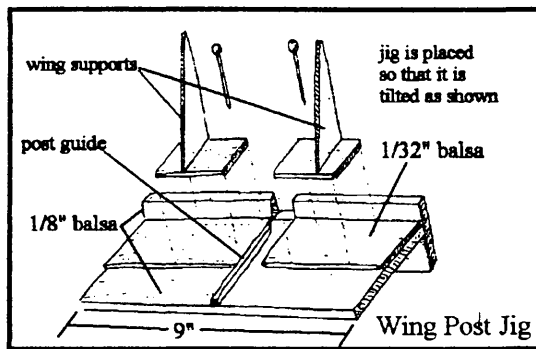


and tweak it past the desired pitch. After a few adjustments it should hold the position. Attach the other blade the same way. The prop is now complete.

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 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 stooage 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 will 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 gives 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 losing 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 O 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 starts 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.

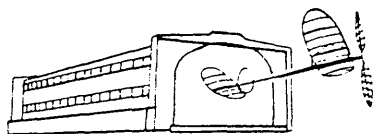
One last bit of information on motor sticks. If your model stalls at a high launch torque and you think the boom is OK the problem could be with the motor stick. It might be too strong. The model will fly great on low to moderate torque, but stalls when released at the desired launch torque. Try this. 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

ECIM

24 Kennebec Court
Bordentown NJ 08505

EAST COAST INDOOR MODELERS
1931



Lakehurst, NJ

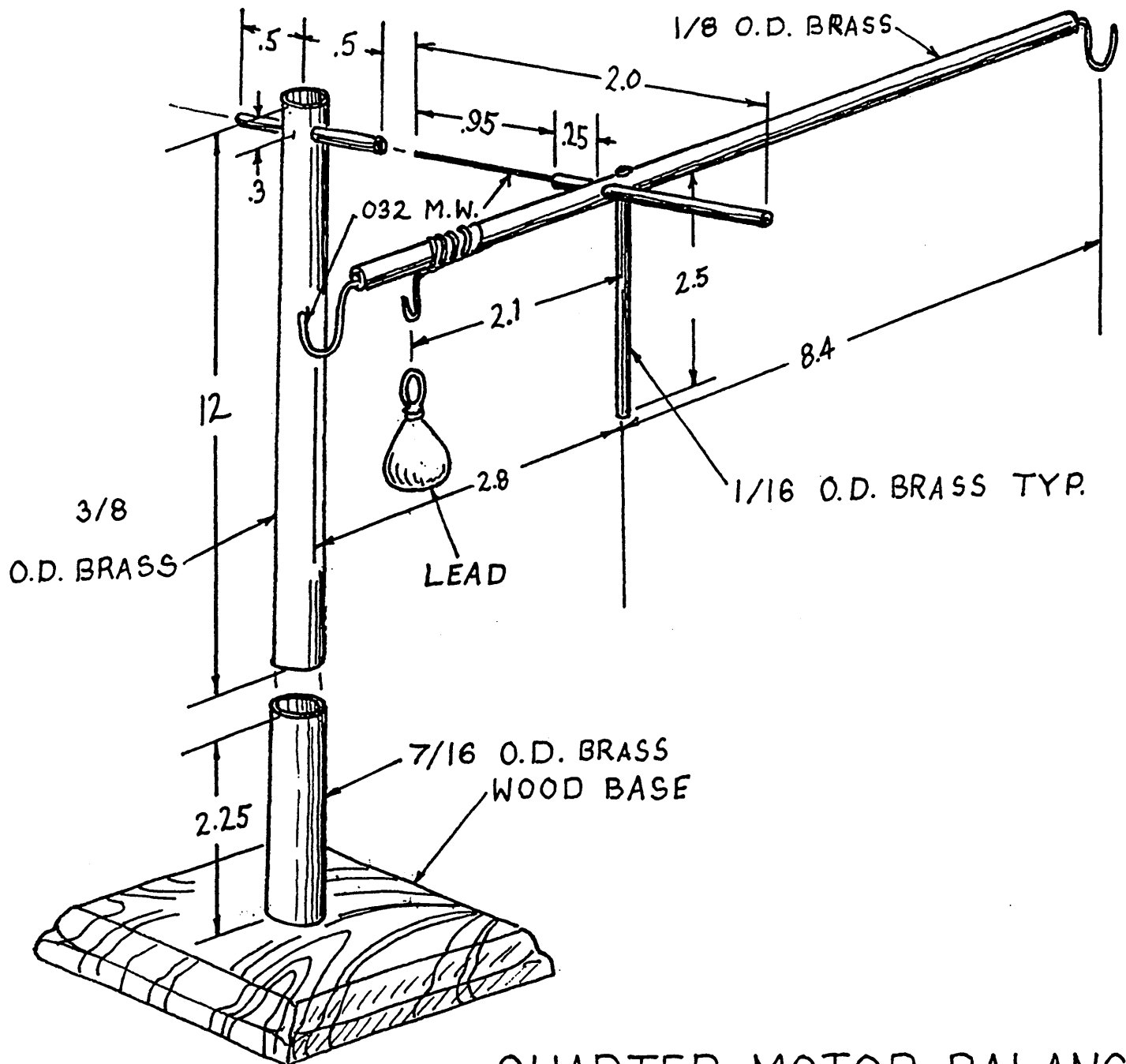
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1997 AMA Contests

<i>Memorial Weekend Session</i>	<i>3 Days</i>	<i>May 24, 25, 26</i>
<i>July 4th Pete Andrews Contest</i>	<i>4 Days</i>	<i>July 3, 4, 5, 6</i>
<i>Labor Day Weekend Contest</i>	<i>4 Days</i>	<i>Aug 29, 30, 31, 1st</i>
<i>FAI U.S. Team Regional Contest</i>	<i>3 Days</i>	<i>July 4, 5, 6</i>

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 Iedgestone
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

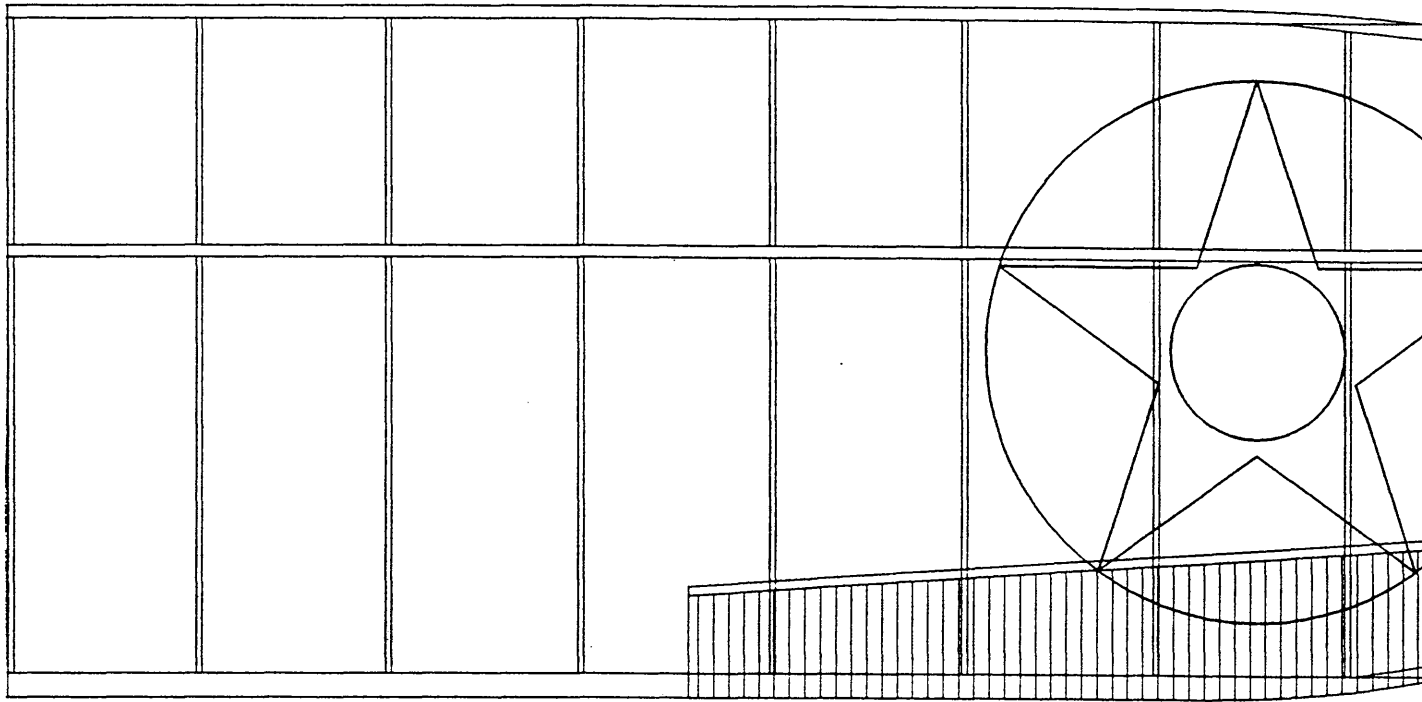
Prop blocks and forms

Micro-X
Box 1063
Lorain, OH 44055

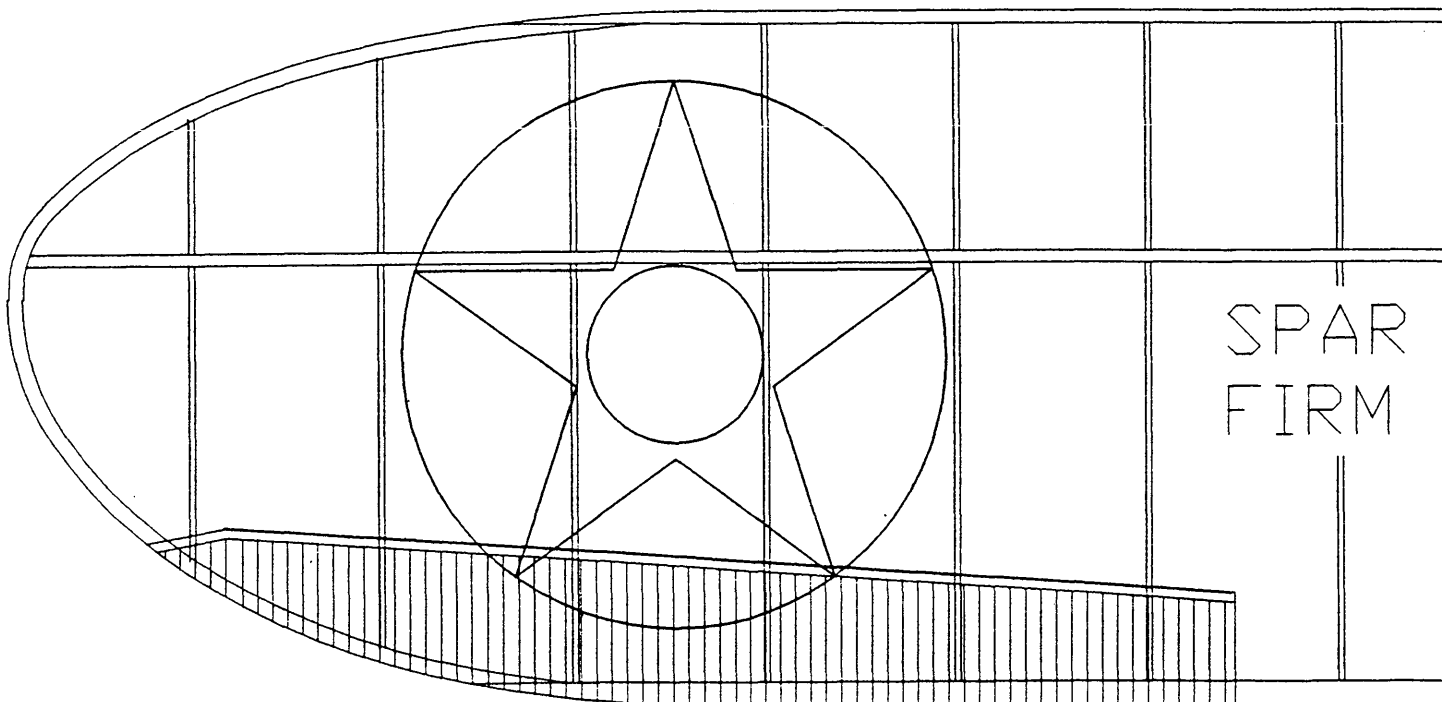
Complete line of indoor plans and supplies
Catalog \$1.50

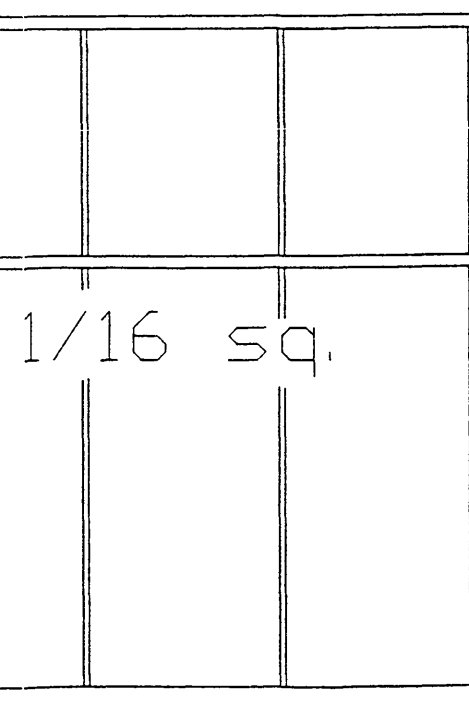
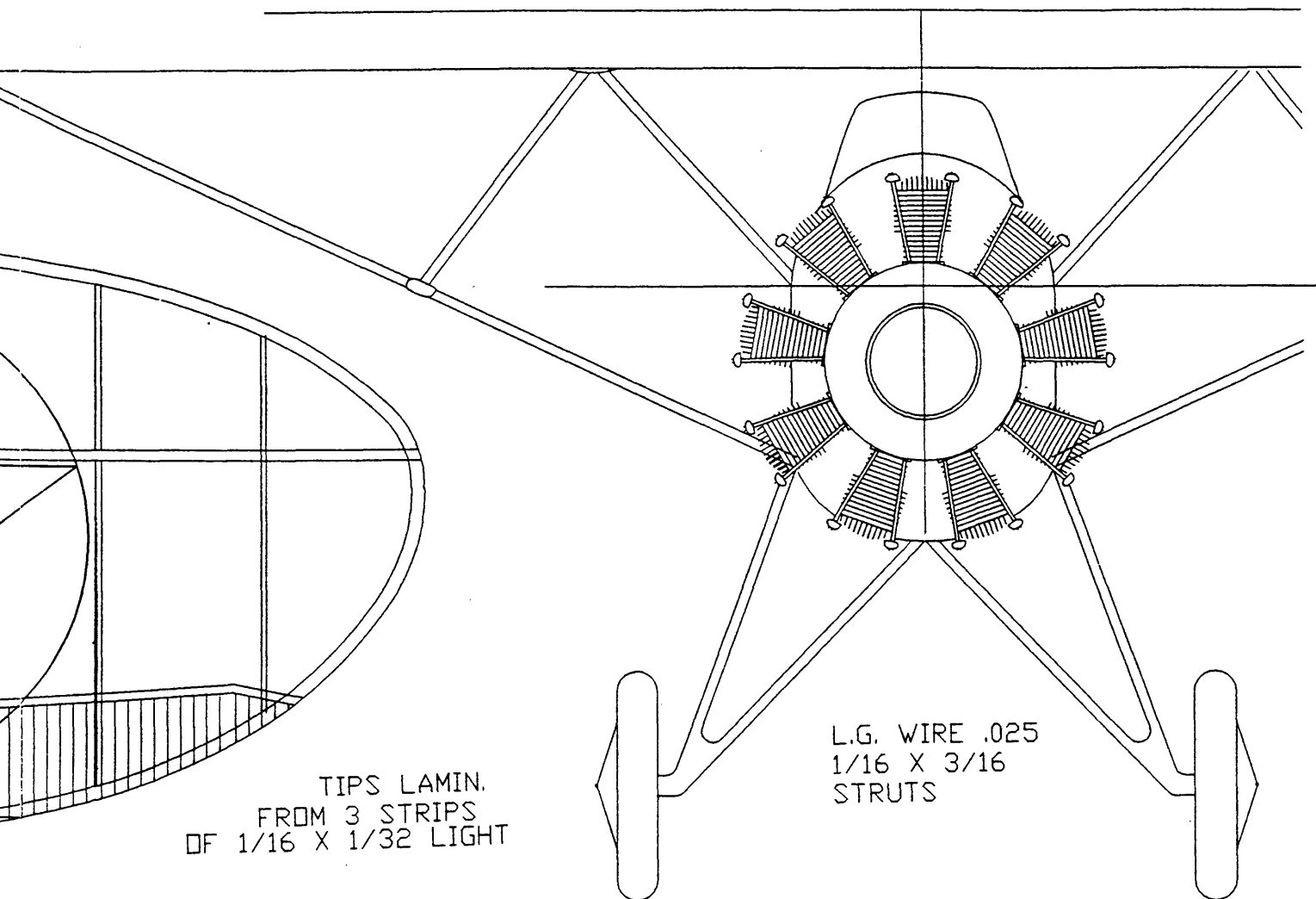
RIBS 1/32 SHEET, MED LIGHT

L.E. 1/16 X 1/8



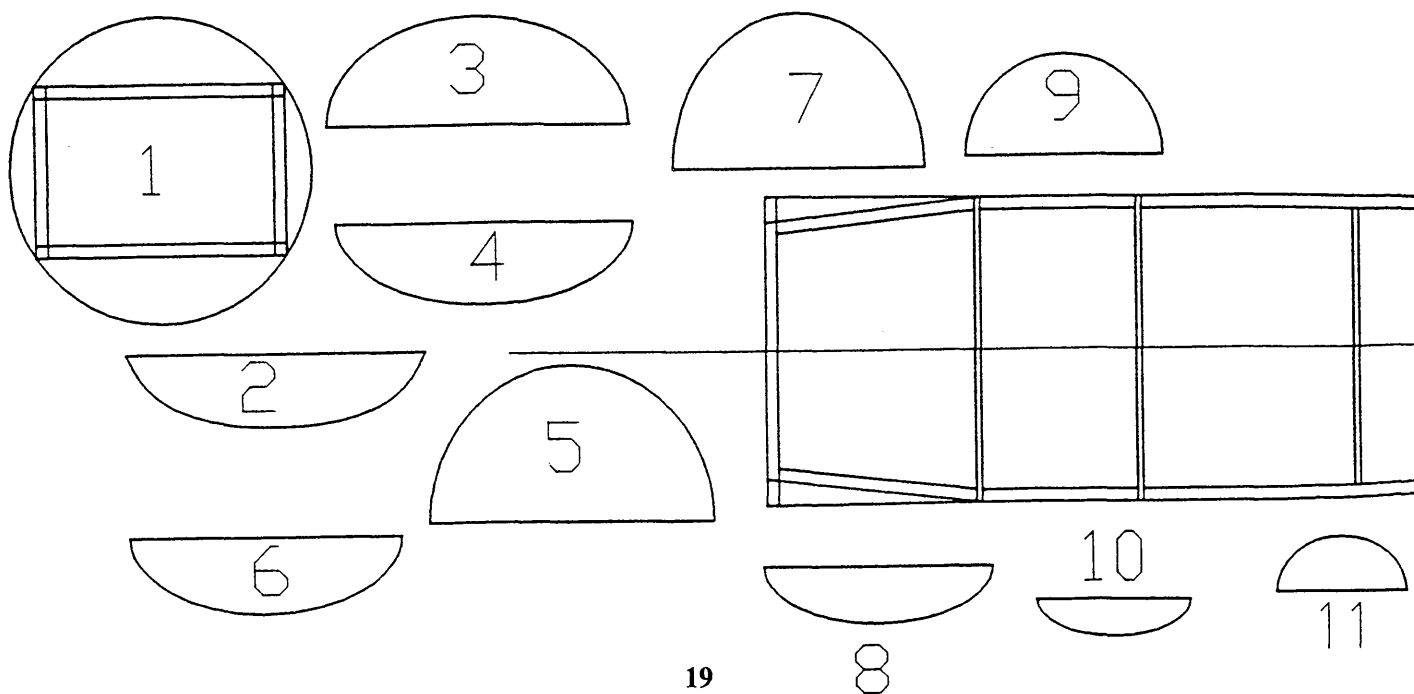
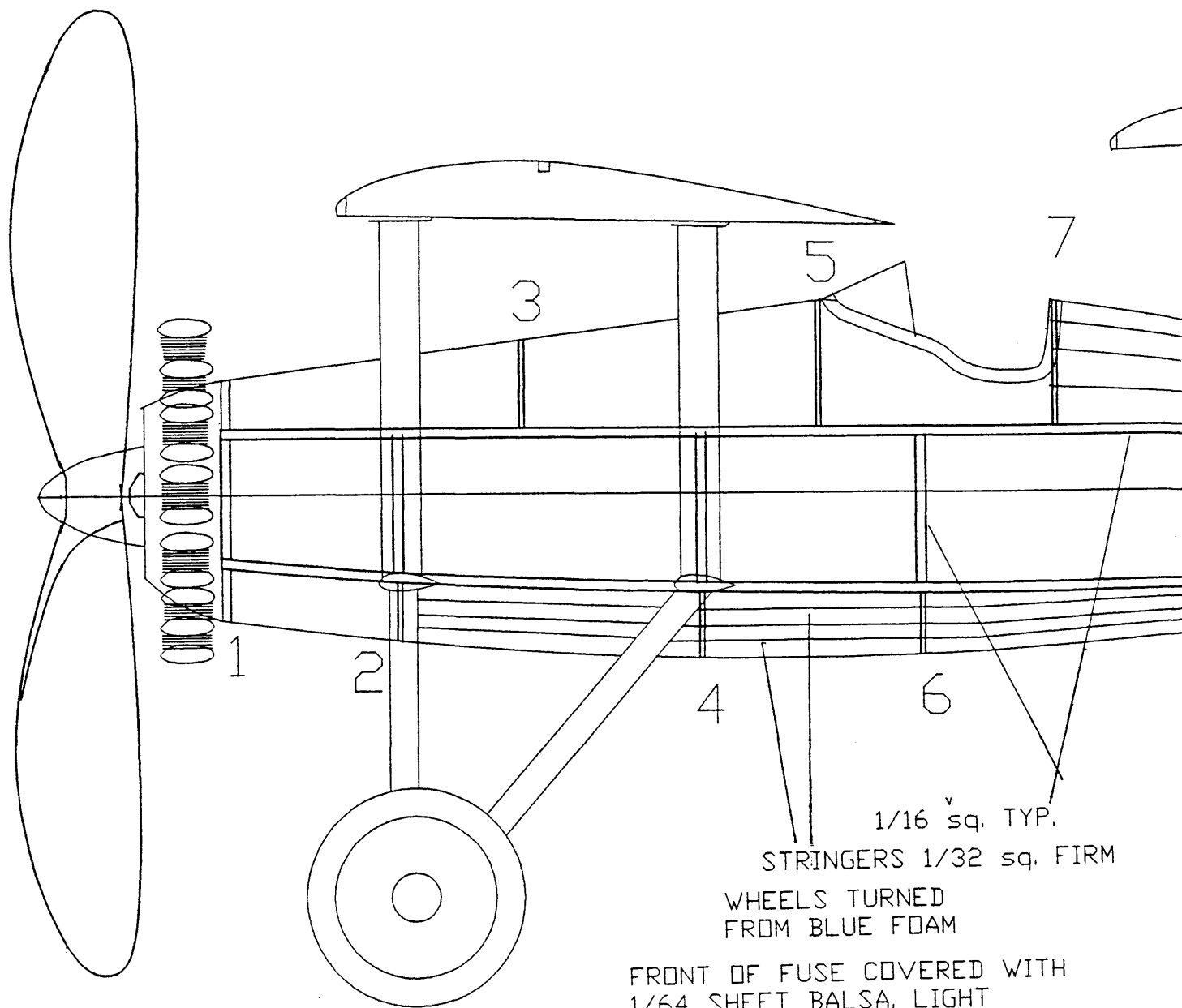
T.E. 1/16 X 1/8

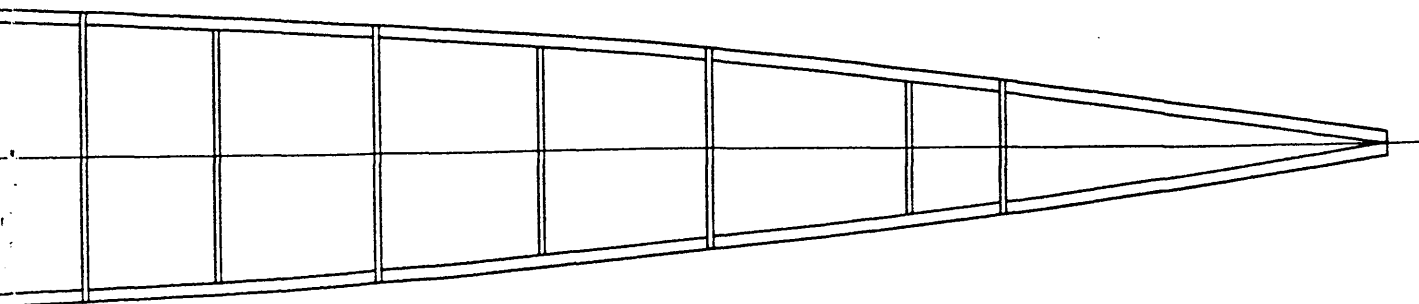
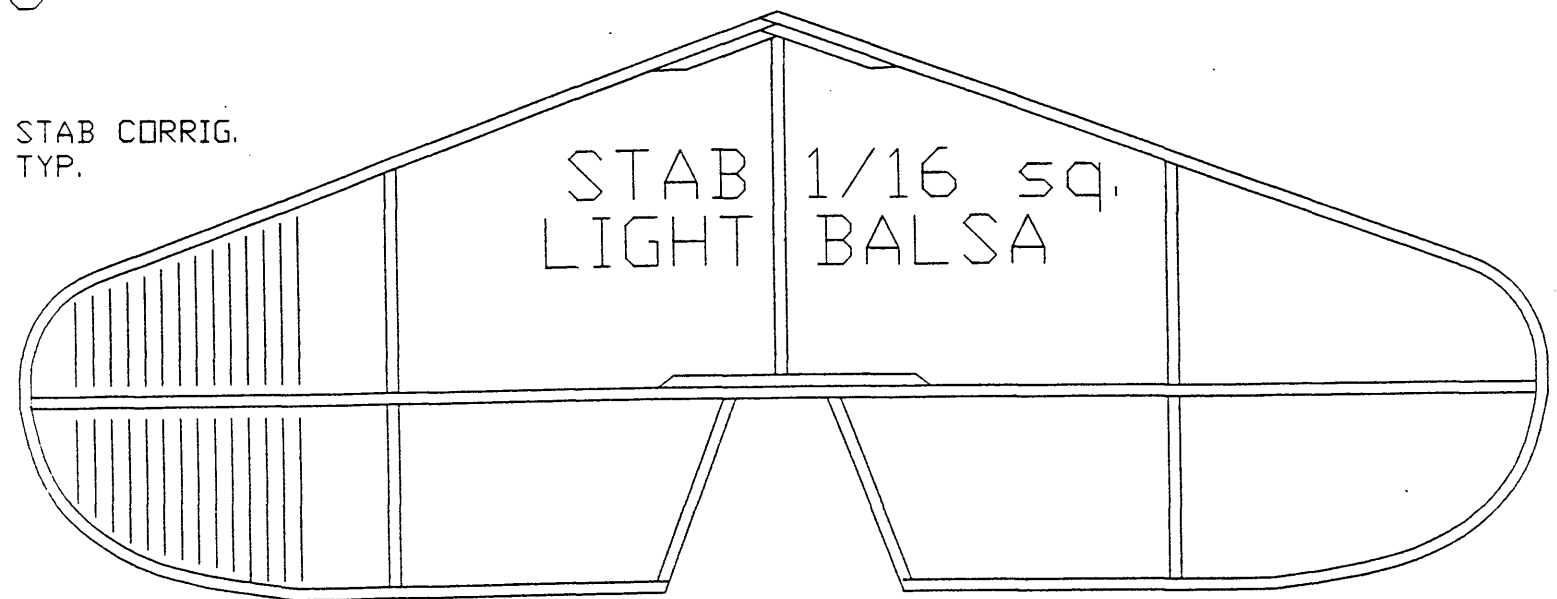
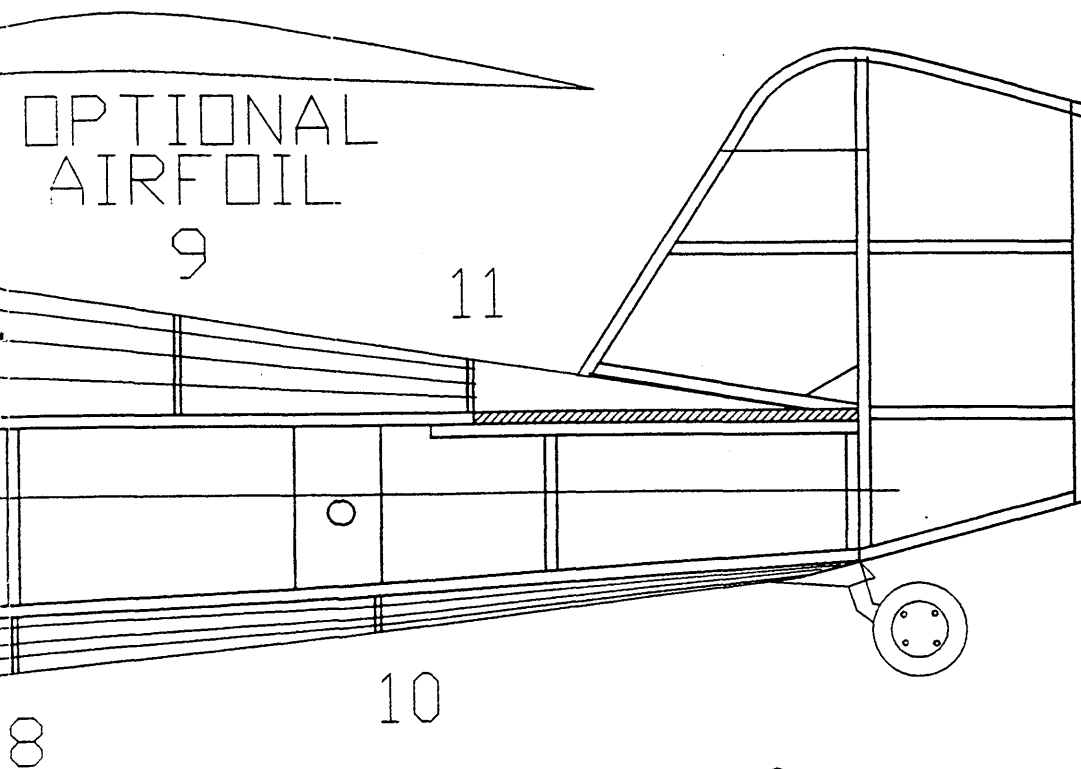




ENGINE MADE FROM BALSA CYL.
WRAPPED WITH THREAD, WIRE PUSHRODS.
BUILD STRONG FOR NOSEWEIGHT

BOEING MODEL 202
(ARMY XP-15)
RUBBER SCALE MODEL
by STEVE GARDNER



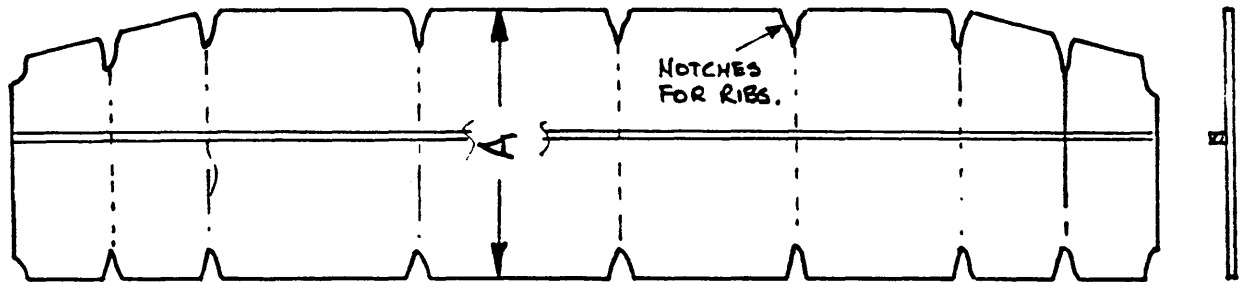


This article is intended for those who have never built a duration type indoor plane, are convinced that they can't, but don't realize that, with a little help, they CAN.

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:

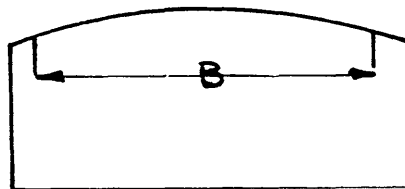


Dimension A is important. The completed wing must not exceed 5.0 inch chord. Lets assume that the L.E. and T.E. are 1/16 sq. (medium). Lightly sanded assume .06 in.

Make Dimension A = $5.00 - .06 - .06 - .04 = 4.84$ in.

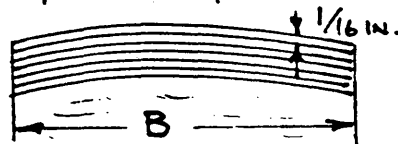
The .04 is insurance against exceeding 5.00 in. finished chord. The spar is to stop the d--- ribs falling over and to stiffen the template.

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.

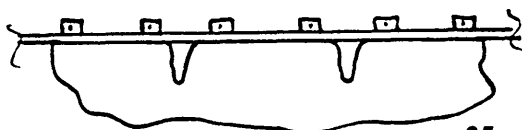
Ribs. Get your rib material, probably 1/32 medium light sheet, and cut a piece length B (a hair more than A) off the end of the sheet. Both ends of this cut must be clean cuts. Use the template and a sharp razor blade (not a balsa knife) to slice off ribs that look like this:



Eye ball the 1/16 in.

Some ribs may be deeper than others. Save these for the dihedral joint and center ribs.

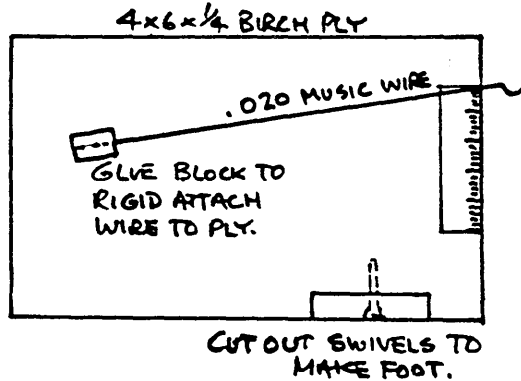
Assembling the wing. Put the usual wax paper etc. on the board and pin the wing template securely down on top of it. Make sure that the board is flat. find some old medium soft 1/8 x 1/16 strip. cut off a zillion little blocks about 3/16 in. long. Use these with pins to fasten the L.E. and T.E. against 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 be 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 it's 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).

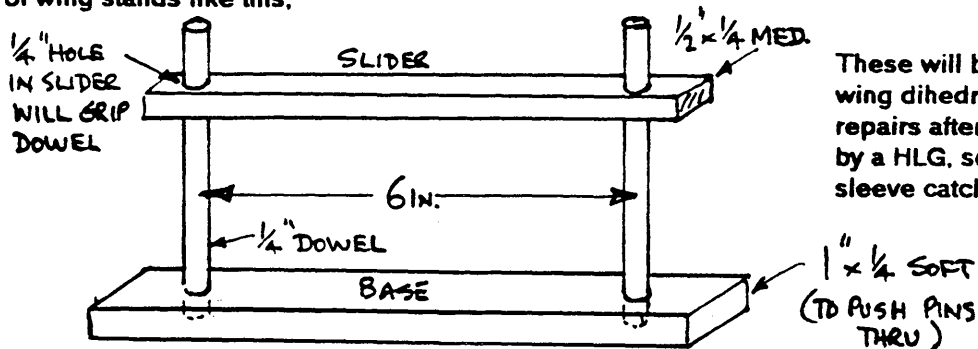
Make a paper scale C - D in. long graduated linearly from 0 to 2.5 and paste it along the ply edge. Tweak the wire if necessary to sit on zero. The use of a linear ^{scale} (equal length divisions) is not quite accurate but will do for now until you can locate some accurate 0.50 gram weights. Beware, 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. of wing stands like this;

Covering with plastic film.

In the meantime make a couple



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!!!

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.

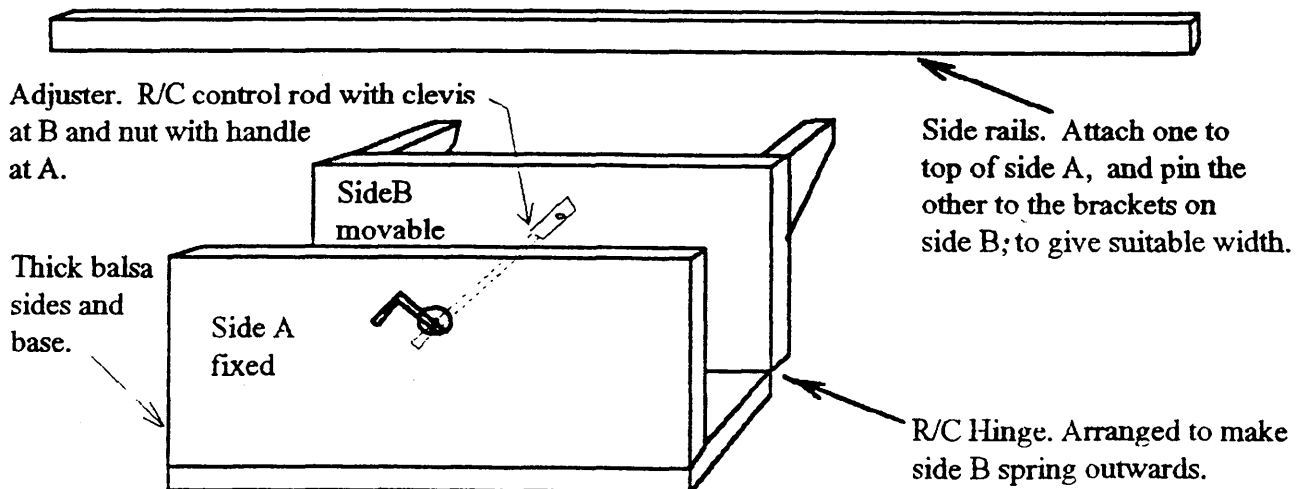
Covering with this type of material is totally different from Jap tissue or condenser paper. It has no inherent stiffness and is full of static. If you let go of a piece it will collapse into a heap like Handi-Wrap only worse. From a strength point of view its a bit like cellophane. Once you have something 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 at least 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.

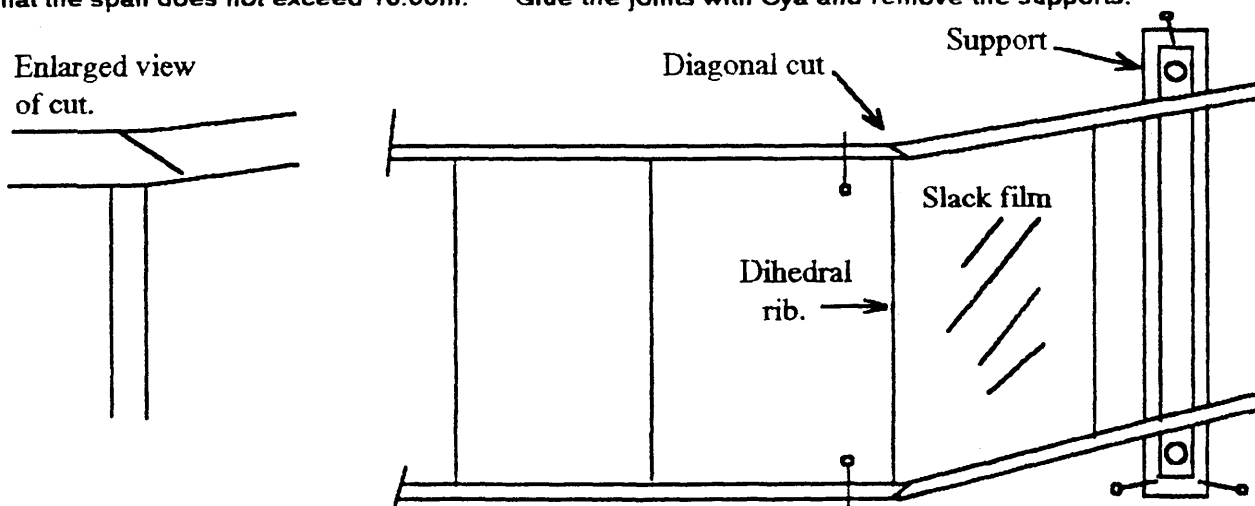
Prepare Adhesive. Use any type of contact adhesive, including rubber cement, that can be thinned to a rather watery consistency. I use Elmers SAF-T Contact Cement. This is water soluble. Check building supplies and craft shops. carefully lay the frame, topside down, on the film. Using a small brush apply 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:

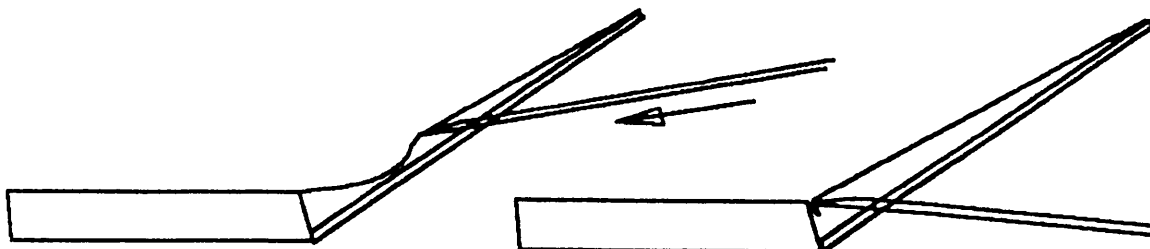


Apply adhesive. With a tiny brush apply a little thinned adhesive to wick in on the L.E. and T.E. at the dihedral ribs. Let it dry. Go around the entire outline and across the dihedral ribs with adhesive, using as little as possible and let it dry. It may be necessary to push down on the structure to 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.

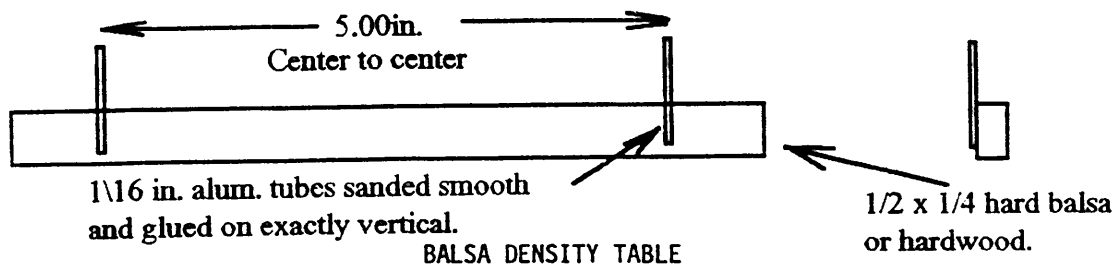


How to get rid of the slack film on the outer wing? Easy. With your fine brush paint a line of thinned glue just outboard (1\32 to 1\16in.) of the dihedral rib. Get a piece of 1\16 th.square and slice the end to look like a chisel. Apply it to the bottom surface about mid-chord and slide it inboard to 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										K
	4	5	6	7	8	10	12	14	16		
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	2.36	2.95	3.54	4.13	4.73	5.91	7.09	8.27	9.45	1.69
1/16 x 1/4	4										
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	4.73	5.91	7.09	8.27	9.45	11.8	14.2	16.5	18.9	.847
1/8 x 1/2	2										
3/16 x 3/16	4	5.32	6.64	7.97	9.30	10.6	13.3	15.9	18.6	21.3	.752
3/16 x 3/8	2										
1/4 x 1/4	4										
1/4 x 1/2	2	9.45	11.8	14.2	16.5	18.9	23.6	28.4	33.1	37.8	.424
1/4 x 1	1										

For closer work, or sizes not listed:

$$\text{Density (lb/cu-ft)} = \text{weight (grams)} \times K$$

$$\text{Weight (grams)} = \text{Density (lb/cu-ft)} / K$$

K appears in the right column in the table. For sizes not listed, K may be calculated from the formula:

$$K = \frac{3.81}{L \times W \times T \times N} \quad 29$$

where L, W, and T are the length, width, and thickness in inches, and N is the number of pieces.

(THEY DO MORE THAN YOU MAY BARGAIN FOR !!)

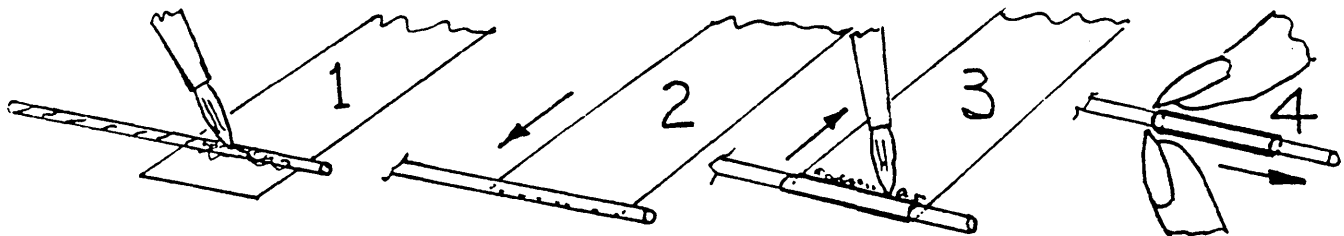
INTRODUCTION If you read Parts 1 & 2 you may by now have ventured into the field of indoor duration. You may also have built and covered the wing and tail feathers of your Limited Pennyplane, together with a jig to position the wing mount tubes on the motor stick. Last month I got carried away and indicated 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

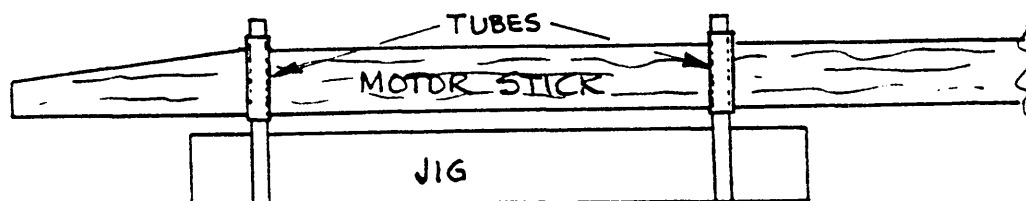


and when dry store them on snug fitting rounded balsa sticks. make the tail mount tube, plus a spare or two.

With an 1/8 drill and tissue about 1 in. wide

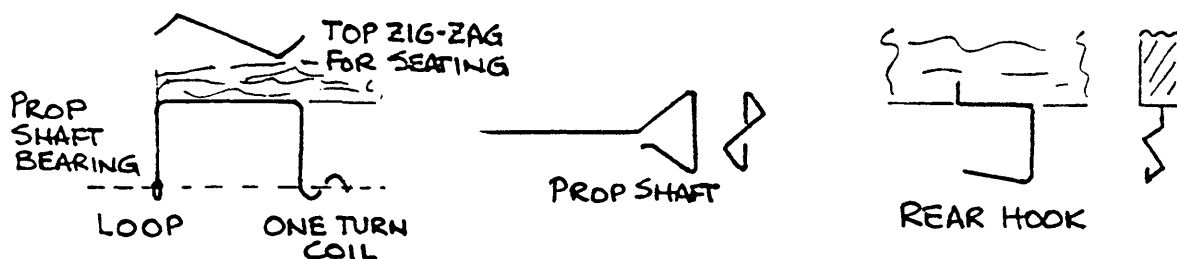
MAKE MOTOR STICK AND TAIL BOOM. Cut the stick and boom per your plan with a bias towards being slightly deeper than shown. When sanding leave the motor stick essentially rectangular cross section. The tail boom can be rounded. Just ahead of the tail position sand the boom to a hair more than 1/8 in.dia. 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.

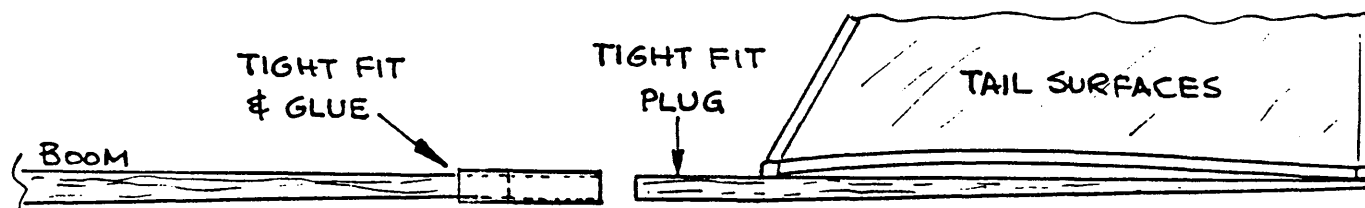
Now for the prop shaft and rear motor hooks, together with the shaft dual bearing. Every one has their favorite hook shape and rubber sleeves, O-rings, etc. My hooks look like a Z shape when viewed from the rubber band side. When wound, the motor tends to center itself on this type hook. The shaft bearing 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.

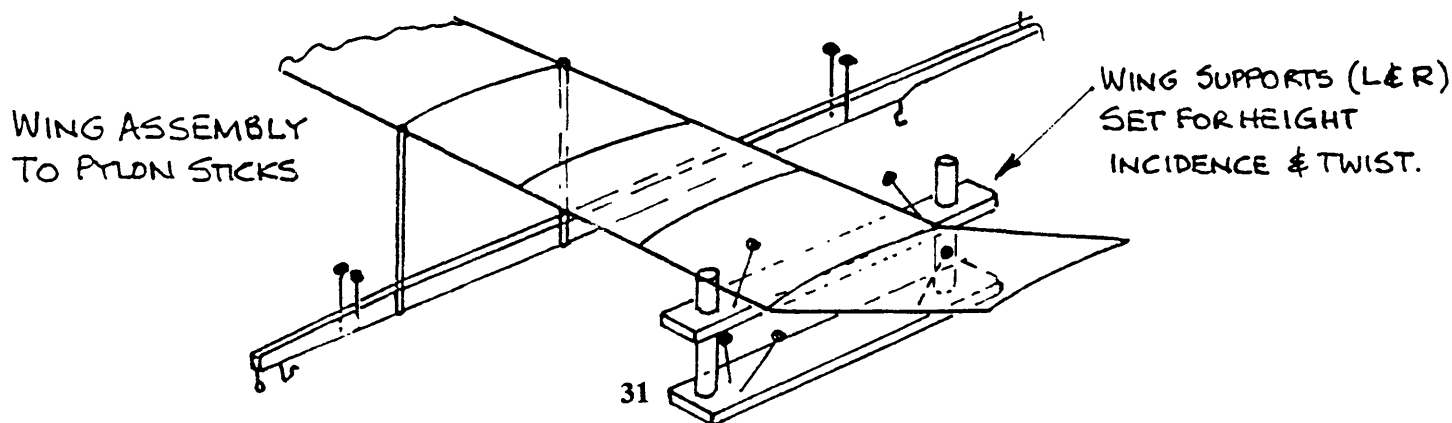
The front bearing and rear hook are both attached by binding a few turns of a strip of jap tissue and thinned Ambroid. A short piece of wire the same dia. as the prop shaft will help you align the bearing. You will need about 2 degrees of left sidethrust. Remember to allow for any slop which will straighten 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?"

DOMEDUSTER

Plan Packet

7

A Dozen Full Size Plans

Stanley P. Fink
1810 Pine St.
Phila., PA. 19103

\$15.00 (incl. p/h)

CONTRIBUTORS

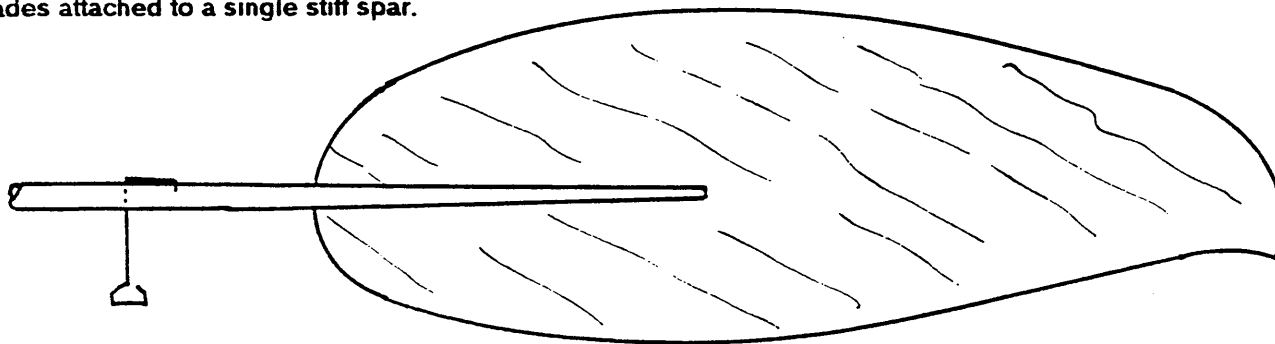
Bob Stalick	"F.A.C. Kaydet" Bostonian
Bob Dunham	"Roll-Out" Catapult Glider
Andy Tagliafico	"Miniquark" World Record Ministick
Doug McLean	"Pennybipe" Biplane Pennyplane
Stan Fink	"Bucky's" F1L (EZB)
Carl Hedley	"Basic" Bostonian
Bob Romash.	"Alfonse" Catapult Glider
Greg Peters	Nakajima KI43 WWII Peanut
Stan Fink	1919 McMahon Monoplane Peanut
Stan Fink	1922 "Bee Line" Navy Racer Peanut
Stan Fink	1930 Polish RWD4 15" Walnut Scale
Stan Fink	1935 Rearwin 7000 "Sportster" 16" Walnut

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 torque meters. However lets start with the propeller.

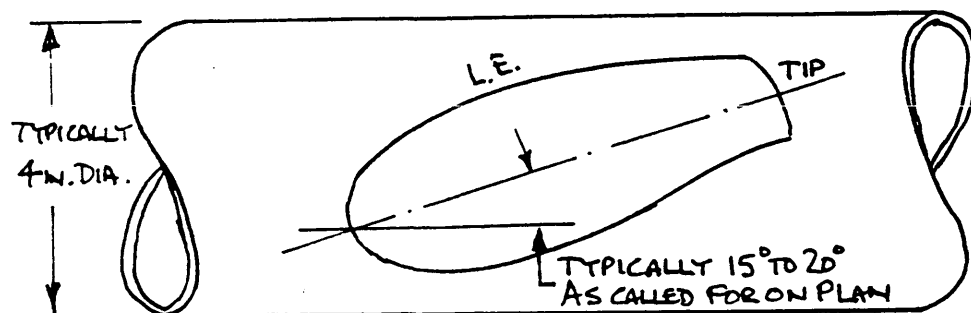
PROPELLER BASICS

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.

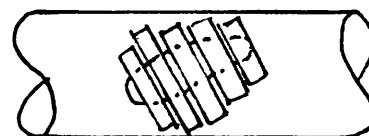
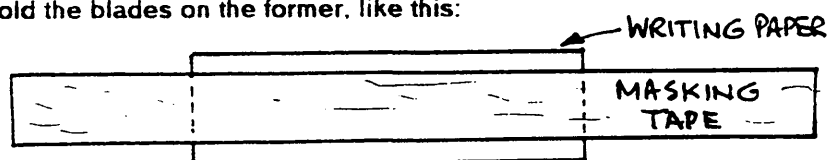


The Bare Blade. This will usually be made from 5 to 6 lb. C grain balsa. The grain may be shown straight or on the diagonal. The blades must be cut from the sheet so as to give a good stiffness match. Blades are usually sanded to taper in thickness, typically from about 1/32in. at the root to perhaps 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



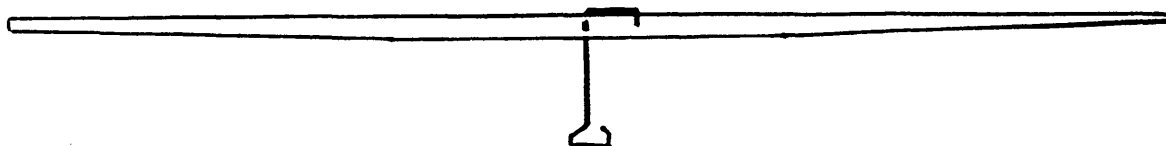
block former, but we will use a simpler and quite good method which involves setting the blade at an angle on a cylindrical surface. This method also induces an airfoil section to the blade. You need a smooth can, bottle or pipe of 4 in. dia. or as indicated on your plan. If the item you find is not 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:



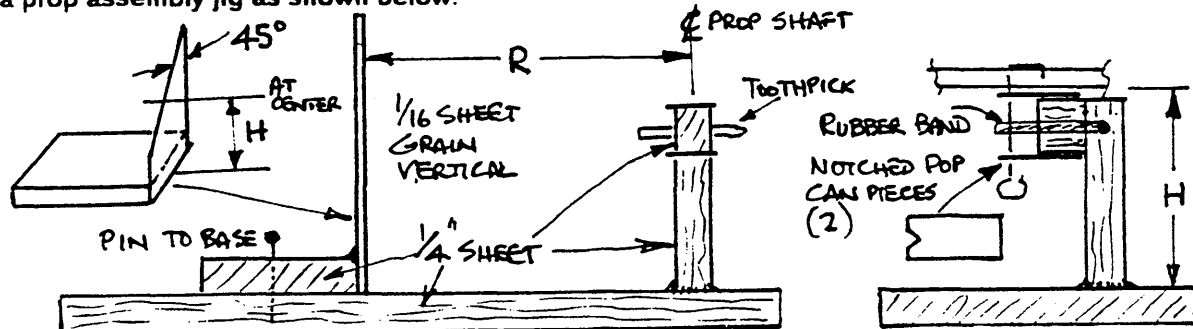
Get an Ace bandage [no, don't steal it from the first aid kit!] . Set the oven to heat to about 200 to 230 deg. Boil water, pour into a pan and add about two table spoons of household ammonia for each cup of water. Throw in the blades. Cover, or otherwise keep hot for ten minutes. The heat plus ammonia 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 of the 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. $R = 0.159 \times \text{Pitch}$ (For 20in. pitch $R = 3.2\text{in.}$) 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

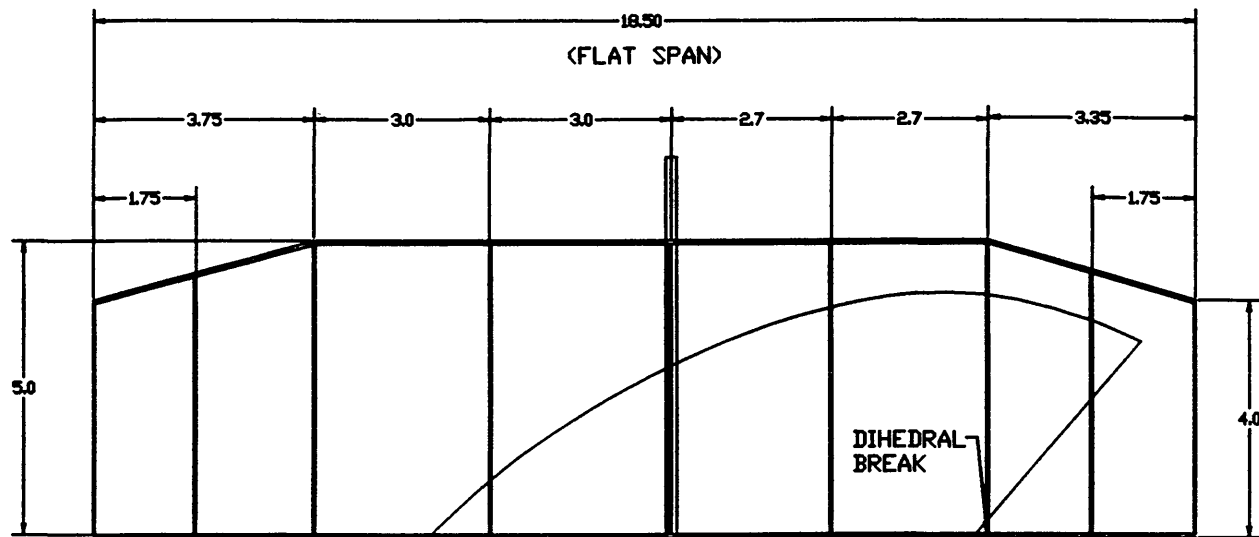
Weigh the complete model without rubber. It must be at least 3.1 grams. For power, TAN 2 is the best. However it only comes in widths suitable for outdoor flying, 1/4in. etc. If your model is close to the nominal 3.1 grams, you will need some cut to .075, .080, and .085in. for starters. If your model 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;

$$(\text{Turns wound} - \text{turns left}) \times 60 / \text{flight time secs.} = \text{R.P.M.}$$

Set a target flight duration for your site (be realistic !!). Calculate a motor length assuming you use 90% of breaking turns :

$$\text{Length (inches)} = \text{R.P.M.} \times \text{Duration Minutes} / [0.9 \times \text{break turns per inch}]$$

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.



WING= 1/16" X 1/16" TAPER TIPS
TO 1/32" 8# A STOCK
RIBS= 1/32" 6# C STOCK
WING POSTS .060 ROUND 8# STOCK

MOTOR STICK= 3/16" X 5/16" X 10" 8# A STOCK

1.5° TIP DIHEDRAL
EACH SIDE

COVER WITH ULTIMATE PLASTIC FILM
AND 3M77 SPRAY ADHESIVE

2 DEGREE DOWN
2 DEGREE LEFT

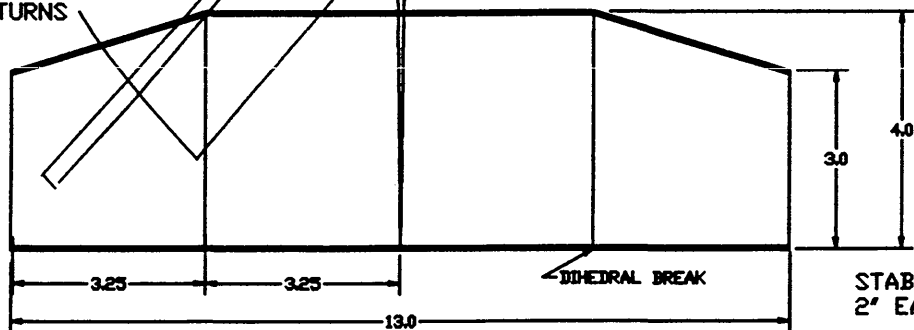
CG @ 75%

MOTOR: .075 X 15.5
2250 TURNS

REAR HOOK DETAIL

PROP HANGER DETAIL

STAB= 1/16" X 1/16" TAPER
TIPS TO 1/32" 6# A STOCK
RIBS= 1/32" 6# C STOCK



STAB DIHEDRAL
2° EACH TIP

WEIGHTS:

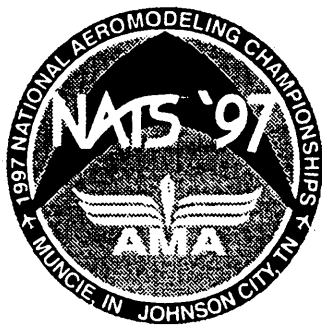
WING .028
PROP .030
REST .052
TOTAL .110

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 _____



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:	\$ _____
<input type="checkbox"/> Check <input type="checkbox"/> VISA <input type="checkbox"/> 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	May	May	May	June	No. of
	28	29	30	31	1	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

☒ 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** _____

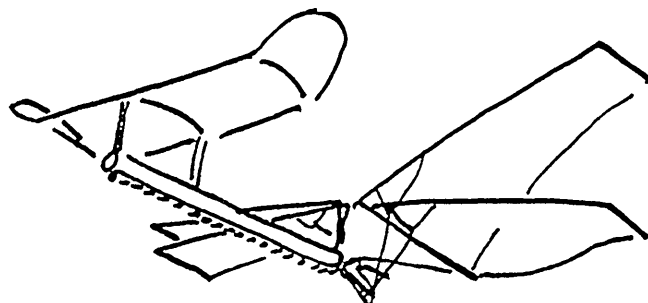
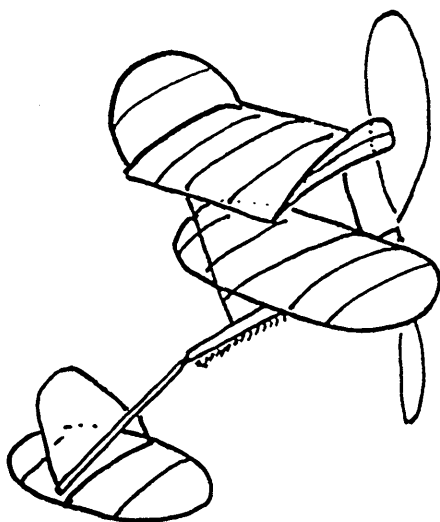
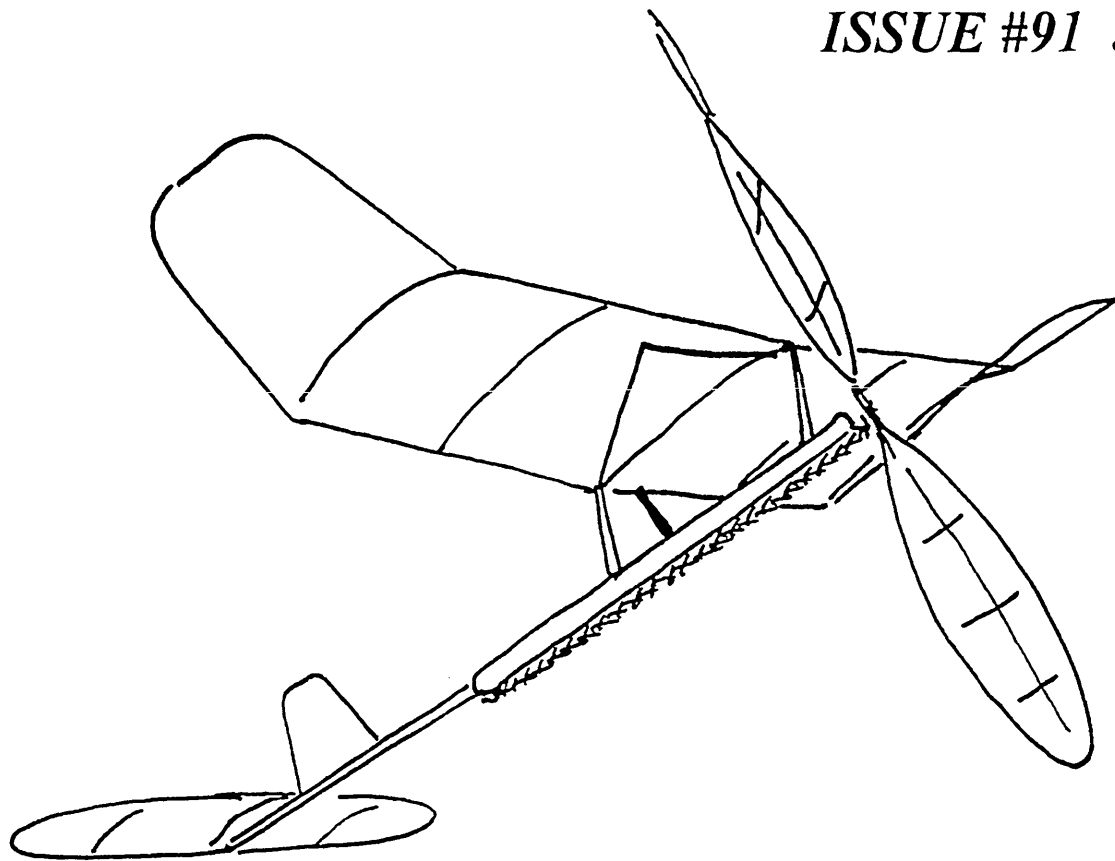
Ceiling Height _____ **Feet**

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

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4 to 6 issues/year depending on
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Howard Henderson (INAV)

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 to 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	16:11	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	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, LAURIE		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
	SEAYER, 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	8:51	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	8:13				8:13
	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
	DOWNES, 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
	COSLUICK, 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	64018	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
	RIPLY, EDWARD	484619	8:51	5:53	7:22	10:40	8:29	10:40
	FELLIN, JOHN	85353	10:37	10:15				10:37
	SEAYER, 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	8867											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
	SEEVER, 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 FLIGHT
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
	SEEVER, 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		6:25
	TELLIER, ROB	55077-J	4:53	5:03				5:03
	CONTESTANT	AMA NO.	FLT 1	FLT 2	FLT 3	FLT 4	FLT 5	BEST FLIGHT
	KENT, MICHAEL	F11	2:42					2:42

PHOTO CAPTIONS:

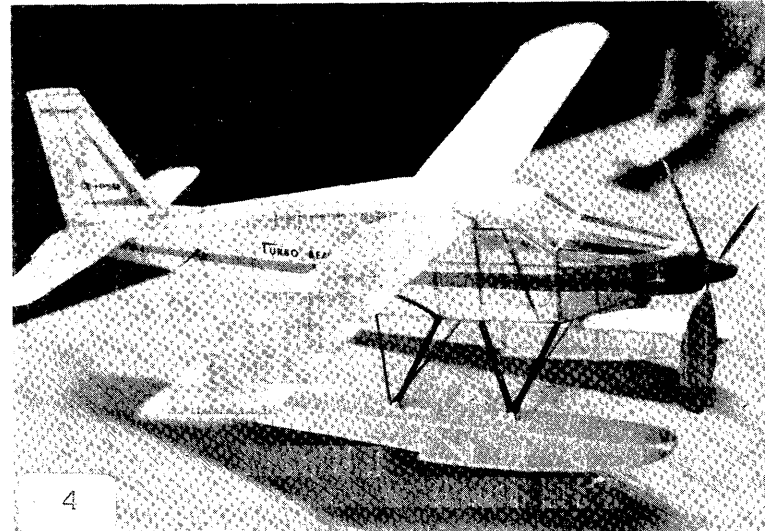
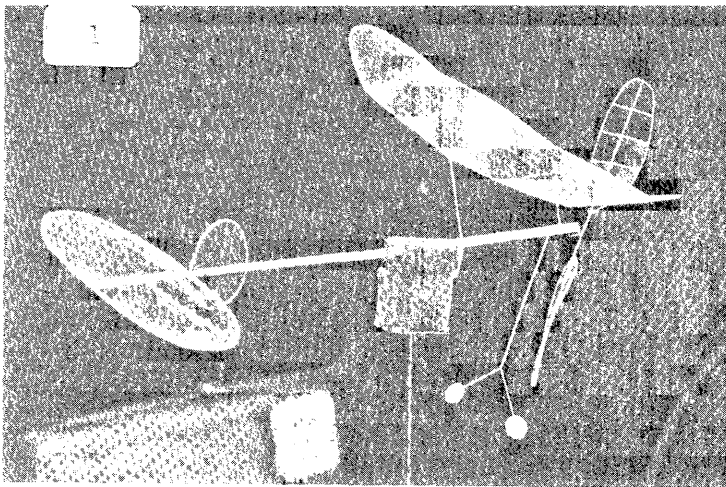
1. Larry Loucka's ROG Stick.
2. Michelle Boyd flew a super General Aristocrat scale model. She took a first in Coconut scale and a third in Golden Age scale.
3. Nick Leonard Jr. with a box chocked full of microfilm models. He is coming up fast!
4. Rich MacEntee's peanut Turbo Beaver on floats. He brought 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 from 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.

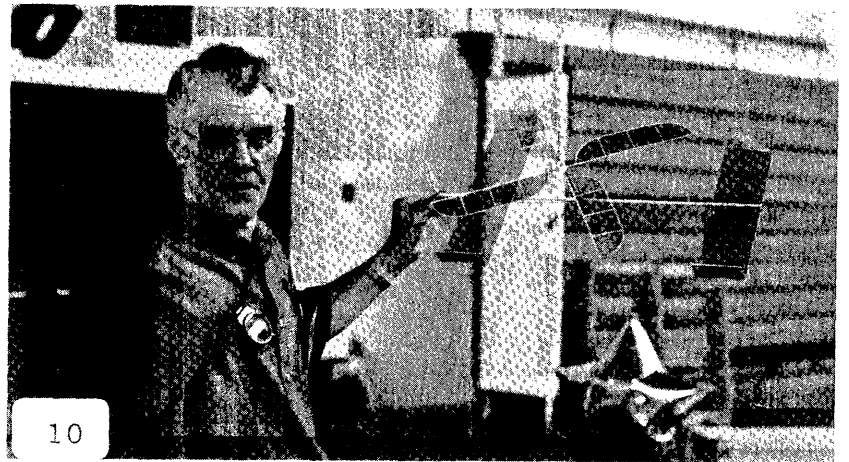
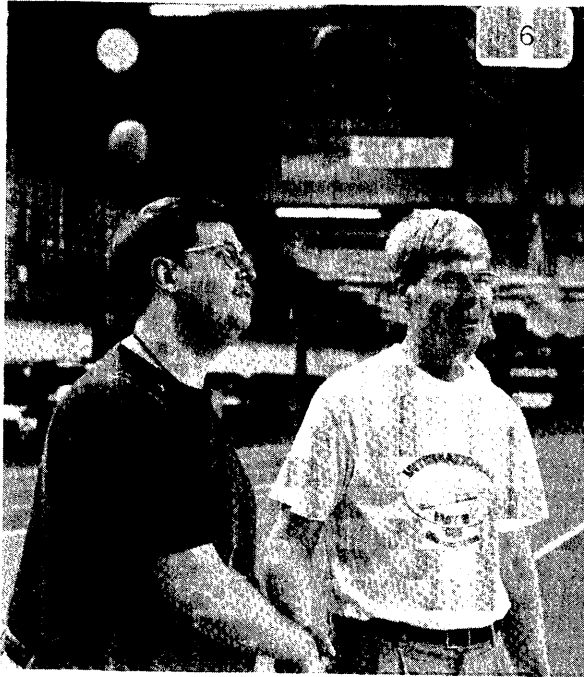
A Note of Apology:

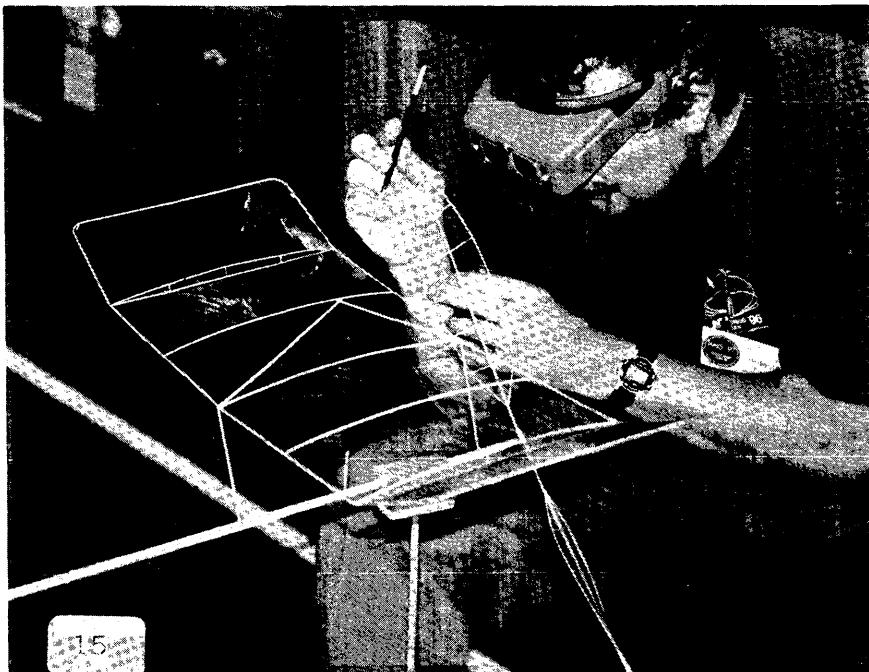
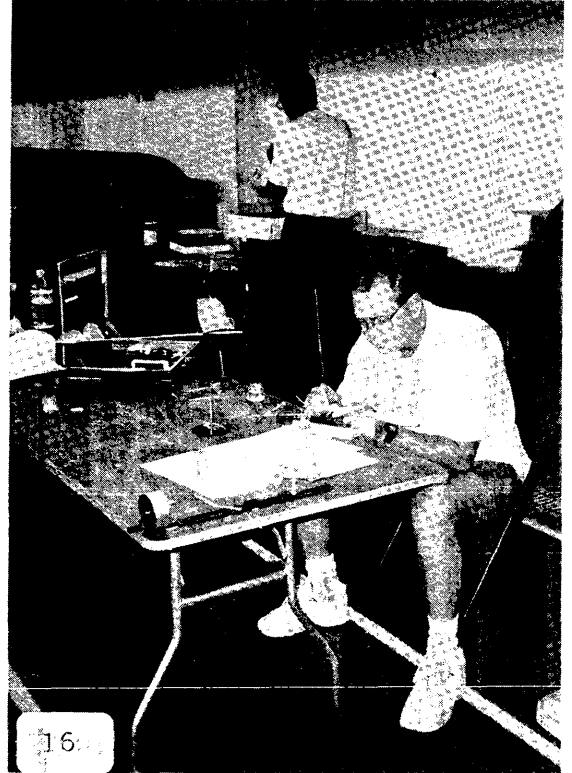
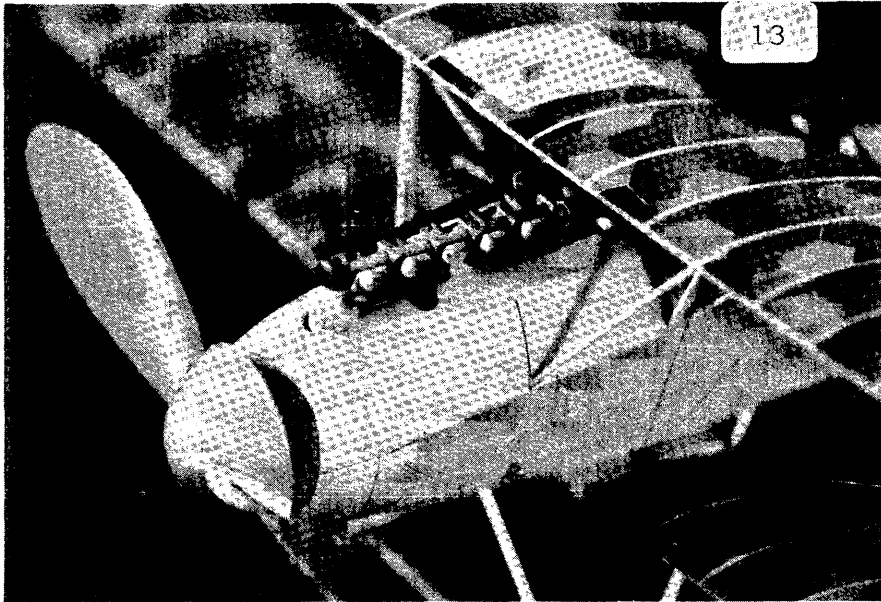
The photos from this years USIC are not up to the standards set by the previous years photos. This is due to a mistake on the part of the photo processor. Ilford XP-2 film, a wonderful black and white film designed to be processed in color chemistry, was used to get the most important photos. The film 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 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	SCHLABB, 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	SCHLABB, 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	80.5	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	58	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	489254	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	63.4	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	SCHLABB, 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	SCHLABB, 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	65.6						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								
	WARMANN, 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	95.5	175.5
4	MILLER, RICH		CORDIE WOT	83	113	99	90	90	90	90	92	172
	THOMAS, GREGORY	185281	PIPER J-3	73.8	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	52	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	SEEVER, 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.	PLACE
							TOTAL	
						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, 5:33, 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 <i>Greg Thomas</i>	62	84	93	90	75.25 + 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	6:30	5:21	6:20	6:20	
SEEVER, 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 Q1	0:86			1:26	4
REES, DAVE	BEVANCA 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:

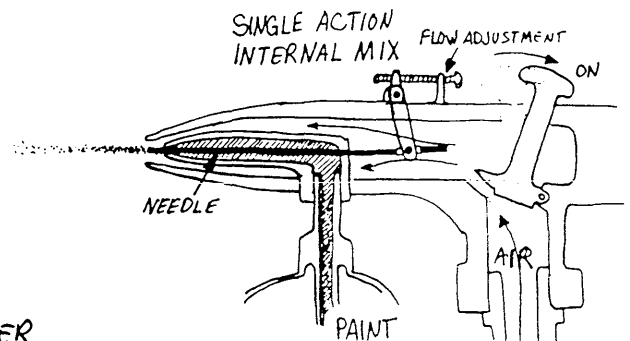
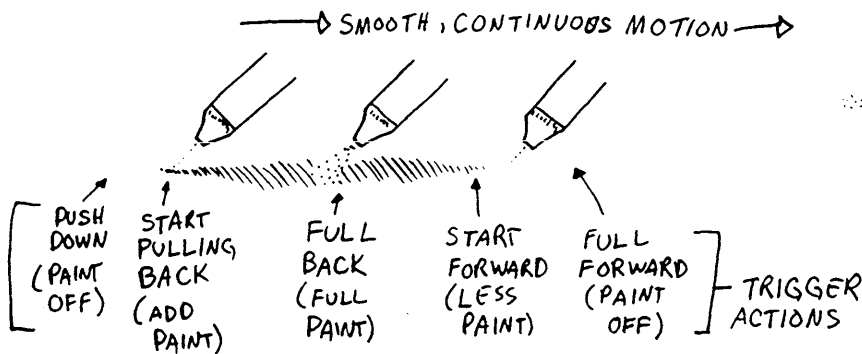
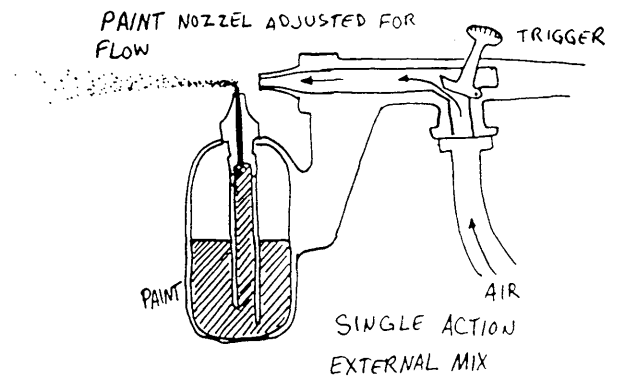
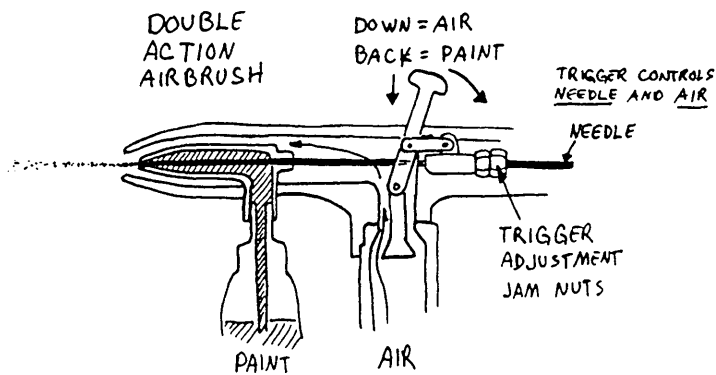
It is a bit of a challenge to mask for differing color areas on something as soft surfaced and delicate as a rubber scale model. You can't rub the mask down onto the surface, and the adhesive used to attach the mask must be weak enough to allow the removal of the mask without stretching or tearing the 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.

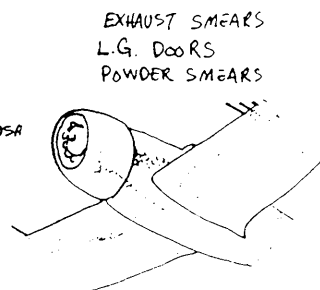
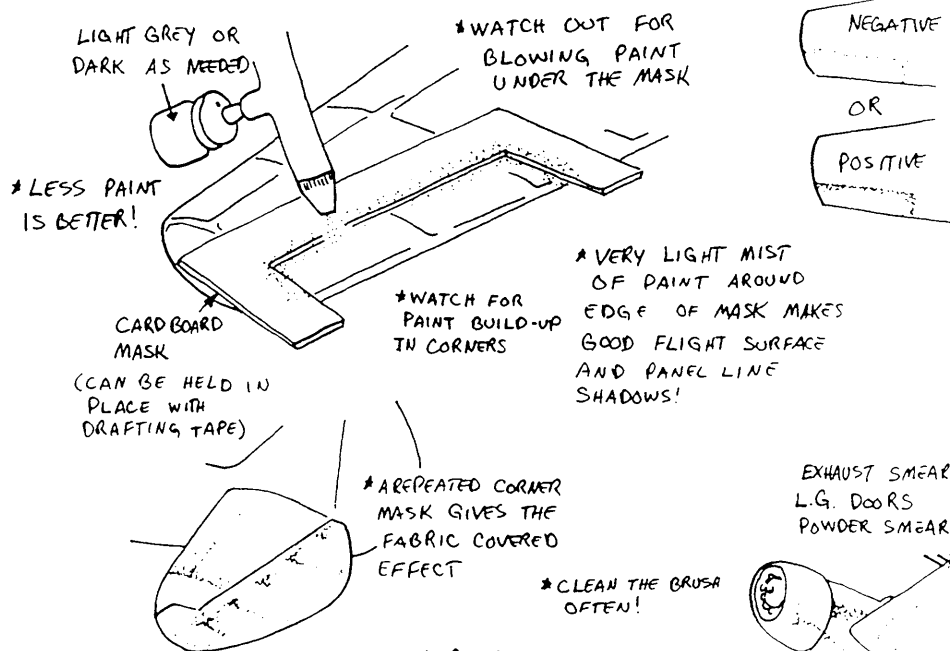
Places to get neat AIRBRUSH stuff!

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	Wing--	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	
Tanny, 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	
Shigezoshi, 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	
Samuelson, 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	
VanDover, 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	
Hirofako, 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	
Kato, 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	
Ponten, 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	
Halas, 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*

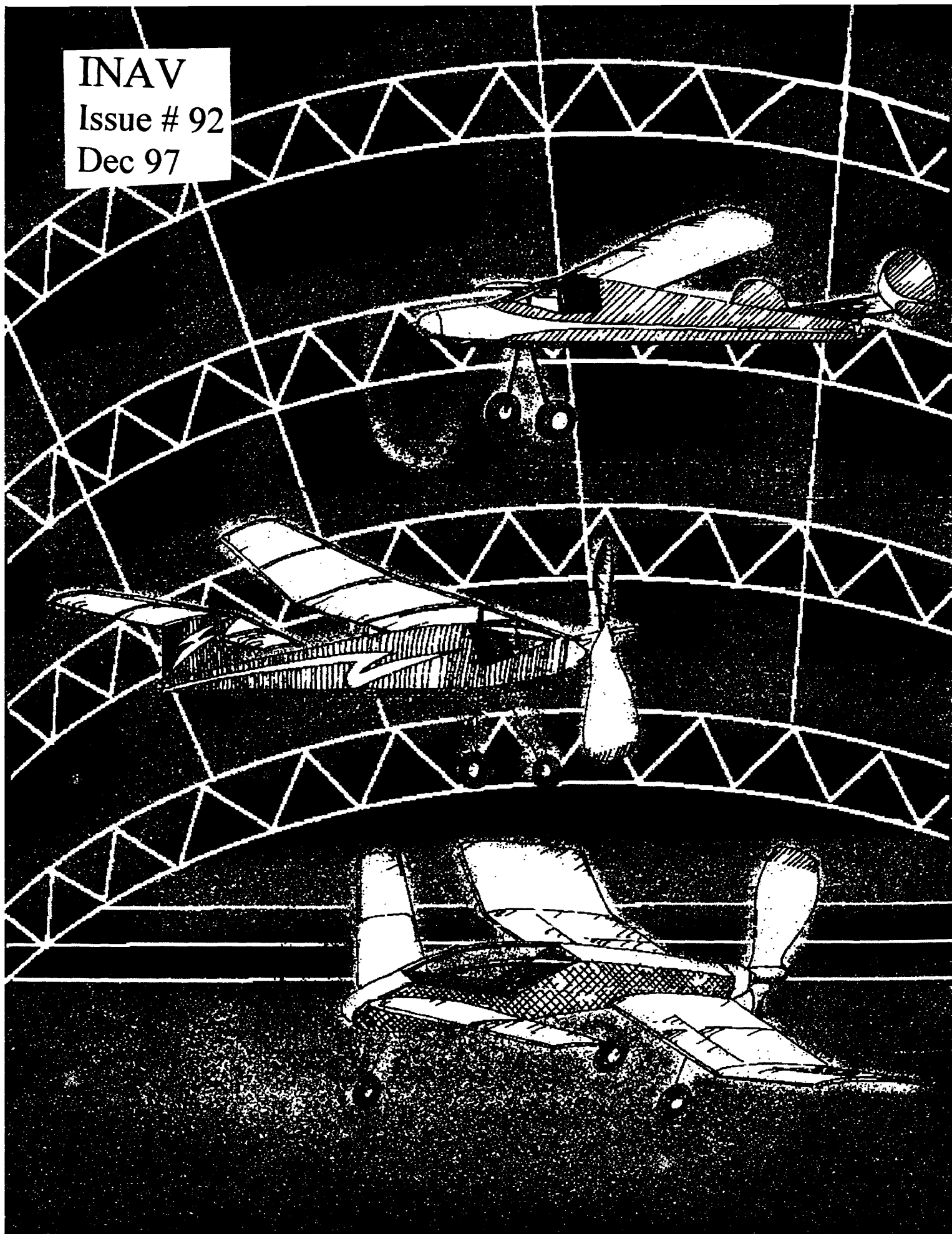
**Meet 1 (August 2, 3, 4) Kibbie Dome
Annual**

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



INDOOR NEWS AND VIEWS (INAV) IS PRODUCED
IN ST LOUIS BY LARRY COSLICK, GENE JOSHU,
HOWARD HENDERSON, BILL MARTIN,
STEVE GARDNER, AND ROY WHITE

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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	635.63
11 LEONARD, Jr., Nick	497460	26:38	27:42	08:21	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.

FID 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
<div> <div>57% yes</div> <div>43% yes</div> <div>N/A</div> <div>24% yes</div> <div>0% yes</div> </div>					

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.

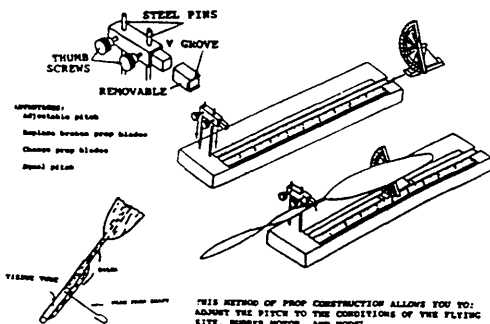
On further winding test, apart from the ones that were done of ¼ motors, several things were noted. 10/97 can be pushed hard, with very little damage to the rubber. 10/97 grapevines when winding if you come in too fast, while the knots stack neater on 7/97. 10/97 took 10% more turns when wound past .35in. 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.

INDOOR MODEL SUPPLY

Box 5311
Salem, Oregon 97304

PHONE
1-503-370-6350

PROP PITCH GAUGE



FOR INDOOR CEMENTS

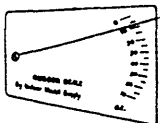
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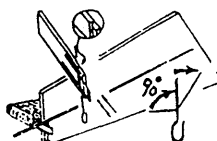
I.M.S. RUBBER SCALE



PROP BLOCK PROP SHAFT ATTACH

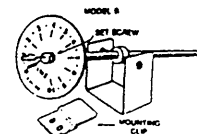
The angle between the prop shaft and the prop spar must be accurate in TWO PLANES. Attach this fixture to your prop form and you will not only build it correctly, but when it is returned for repairs it will be correct. There is a spring load and snap fit into a machined slot. The distance between the shaft and block is adjustable.

PROP BLOCK PROP SHAFT ATTACH



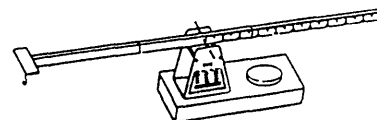
I.M.S. TORQUE METERS

Torque Meters are used to measure twist or torque of a rubber motor as to consistently obtain maximum turns without breaking the motor, consistent flights, and avoid hanging models in the rafters.



I.M.S. Torque Meters are of beautiful brass construction with adjustable zero set screws, bold print dial face, and come with a drilled clip for quickly attaching to your flight box and 12 lines of simple illustrated instructions. The B Meter has a quick release for a wound motor. You will never want to be without it.

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SEND RESULTS TO MIAMA, 2180 Tigertail Ave, Miami, FL 33133

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, Simon Ip as Registration Coordinator, and Dick Fahey and Phil Alvarez 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	<u>56.78</u>	53.81	54.37	17.37	45.66
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Bostonian

					<u>Charisma</u>	<u>Score</u>
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)
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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

					<u>Scale</u> <u>points</u>	<u>Bonus</u> <u>points</u>	<u>Total</u> <u>points</u>
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

					<u>Scale</u> <u>points</u>	<u>Bonus</u> <u>points</u>	<u>Total</u> <u>points</u>
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 1st. 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 Kibbie 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 polyhedral 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 flew 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 Aronsteins 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 good, 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	2 nd 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)

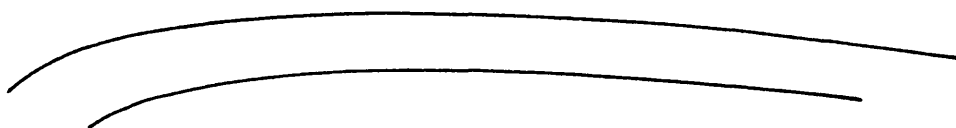
1997 Kibbie Dome Annual Moscow Idaho

Place	Contestant	Time	Place	Contestant	Time
EZB			Hand Launched Glider		
1 st	Larry Coslick	29:45	1 st	John Buskell	2M 07
2 nd	Mike Palrang	28:17	2 nd	Bruce Kimball	1M 47
3 rd	Bruce Kimball	26:52	3 rd	Ed Berray	1 M 06.7
Intermediate Stick			Standard Catapult Glider (Best 2 of 9)		
1 st	Mike Palrang	28:40	1 st	Wally Miller	2M 17.5
2 nd	Gene Joshu	27:42	2 nd	Ed Berray	2M 13.25
3 rd	Charles Dorsett	26:34	3 rd	Mike Palrang	1M 59.8
F.I.D.			Pro - 20		
1 st	Larry Coslick	46:27	1 st	A. Tagliafico	27:13
2 nd	Ed Liem	38:25	2 nd	Larry Coslick	25:51
3 rd	Darryl Stevens	35:06	3 rd	Wally Miller	19:27
Limited Penny Plane			P-24		
1 st	Jim Clem	14:54	1 st	John Lenderman	7:48
2 nd	John Lenderman	14:30	2 nd	Lew Gitlow	7:31
3 rd	Mike Palrang	14:08	3 rd	Albert Lio	6:03
Penny Plane			A - G		
1 st	Jim Clem	16:46	1 st	John Lenderman	5:07.7
2 nd	John Lenderman	15:30	2 nd	David Higgins	3:45
3 rd	Bruce Kimball	12:12	3 rd	Ed Berray	2:11.6
Mini - Stick			Federation R.O.G.		
1 st	Mike Palrang	11:37	1 st	A. Tagliafico	9:01
2 nd	A. Tagliafico	11:36	2 nd	Gil Coughlin	7:07
3 rd	Wally Miller	11:22			
Bostonian			R.O.G. Stick		
1 st	Orv Olm	2:56	1 st	John Lenderman	14:51
2 nd	John Lenderman	2:43	2 nd	Fred T. Hollingsworth	11:05.9
3 rd	David Higgins	2:04			
Ornithopter					
1 st	Gil Coughlin	7:09			
2 nd	Anita Taylor	5:25			
3 rd	Loran Wright	1:08			

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

WINNER 97 NATS LIMITED PENNY

MODEL NAME: LPP SQUARE PENNYBUILDER: 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"

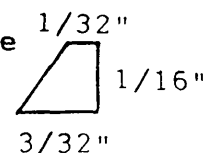
Cut Weight _____ Finished Weight _____ Special Instructions _____

Thrust Bearing, Wire size .017" Other _____ Web. Density 5#Thickness .020" Rear Hook .017" Web. Density 5#Thickness _____ Paper Tubes. Material Used Jap TissueAdhesive 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 _____

WINGLeading 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 BL. 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 triangularfrom 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"

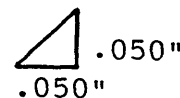
H. .050" Tip. W. _____ H. _____ Trailing Edge Center, W. .050"

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.

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.

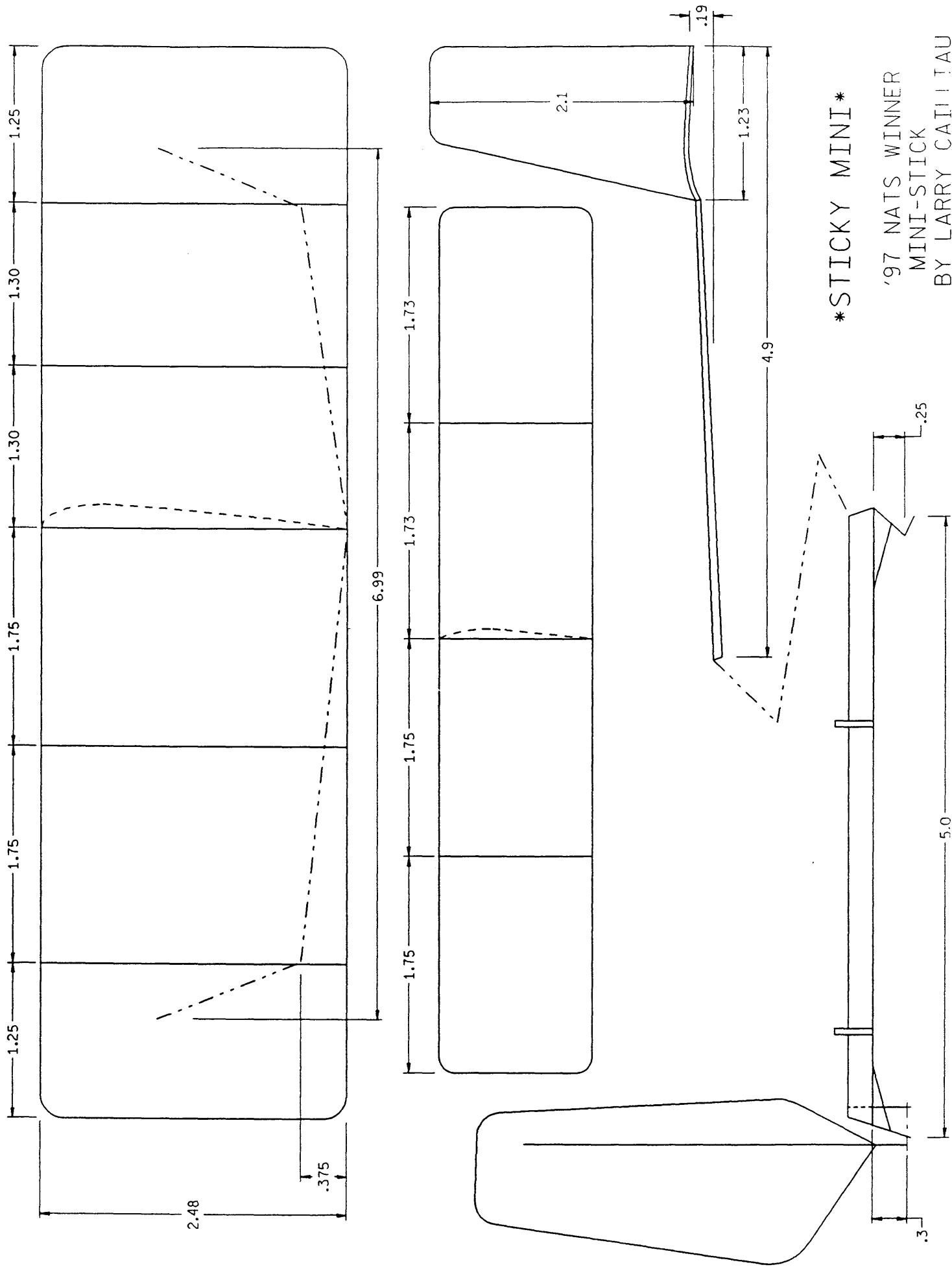
Wash Out. Right panel Wash In. Right panel

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.



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

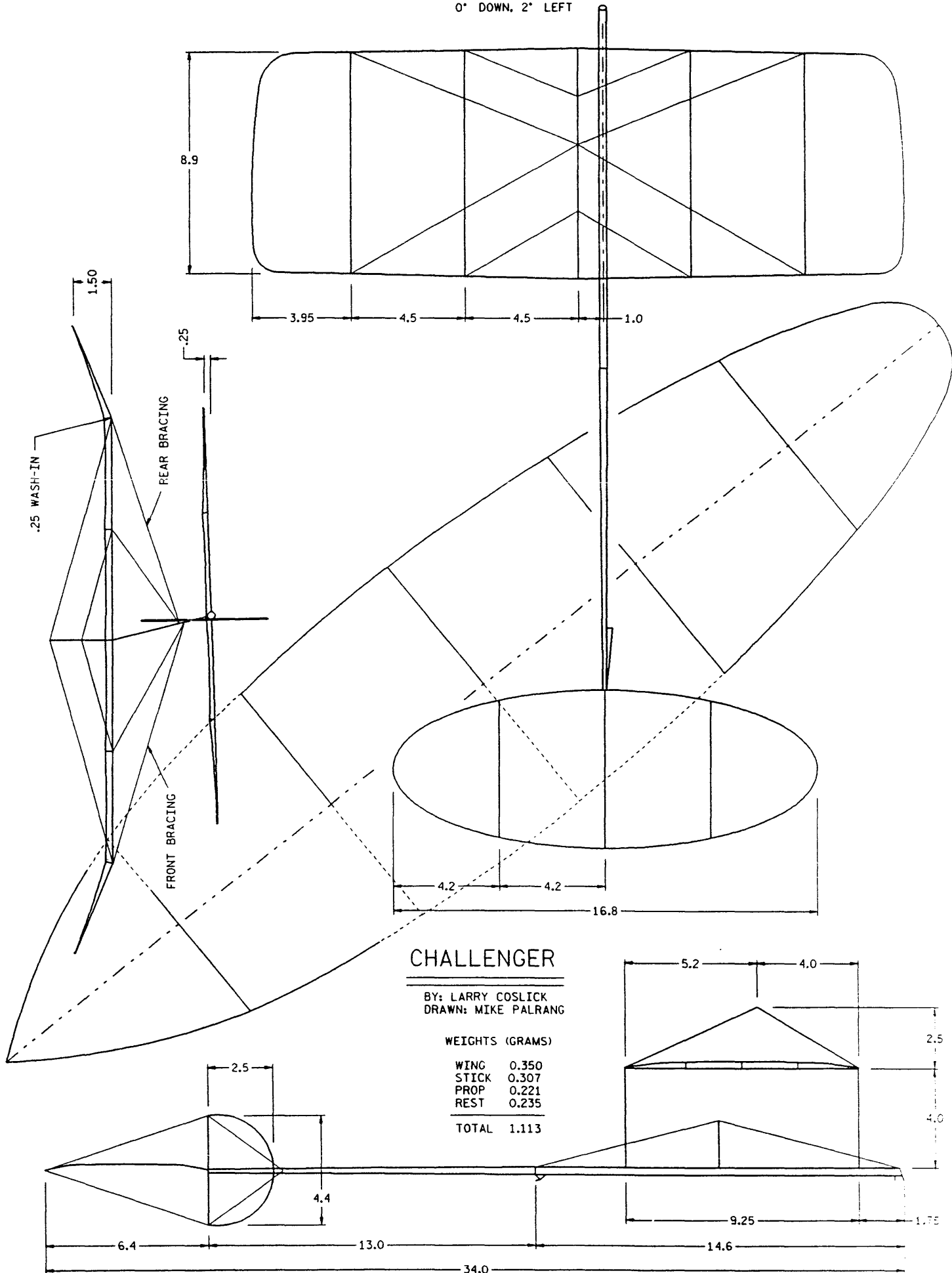
RUBBER

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



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

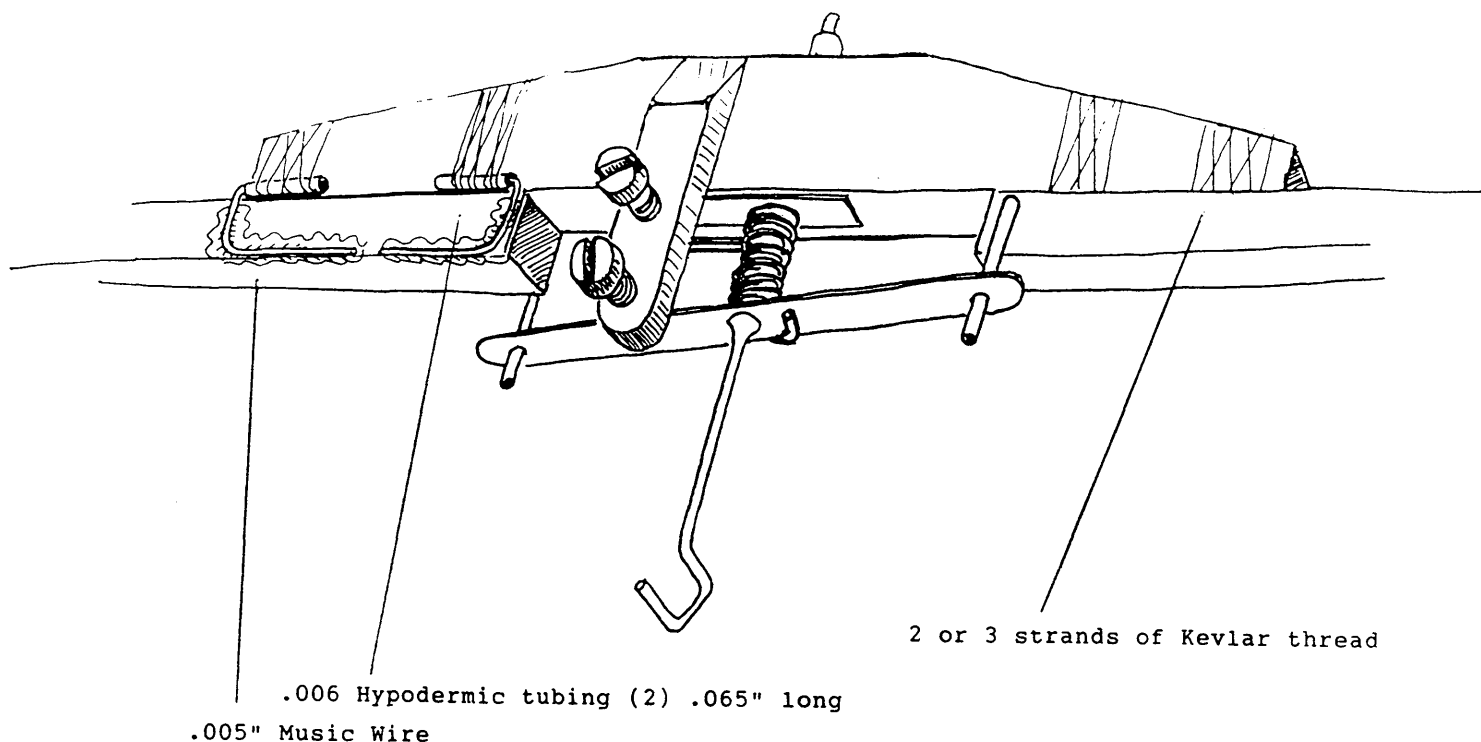
WING

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 BladesProp 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. .205GCovered .222G**Prop, Pitch**Give prop pitch at 45 degrees and one inch from tip. Pitch at 45 degree Pitch 1 inchFrom tip. If V/P, Low pitch 32 High pitch UnknownIf 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 Year8 1993 Weight of Loop. Turns 2075Back off Turns. 10 Launch Torque in inch ounces. .42 Turns Left 0Do you use O rings. Yes. Yes No. TIME 41:10 1997 USIC**TRIM**Wash In, Wing Left panel .2" Wash Out Left panel. 0Wash Out, Right panel 0 Wash In, Right panel 0Wash 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.



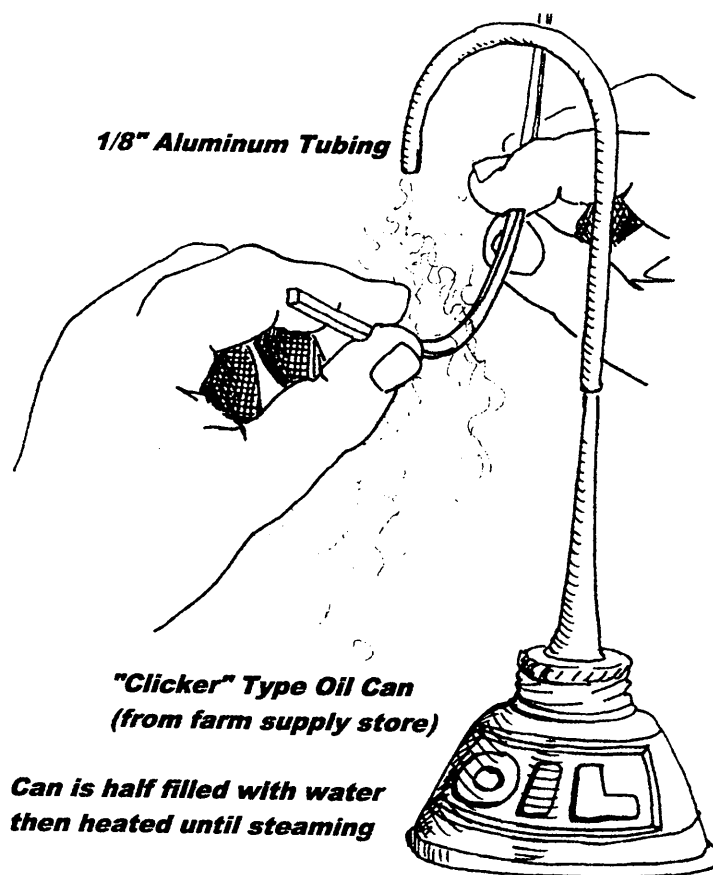
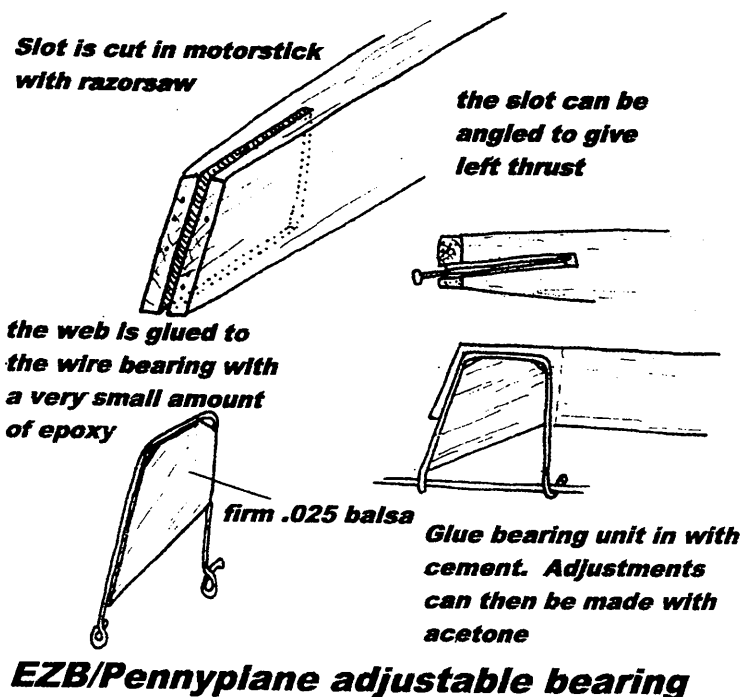
CHALLENGER

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



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.

"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

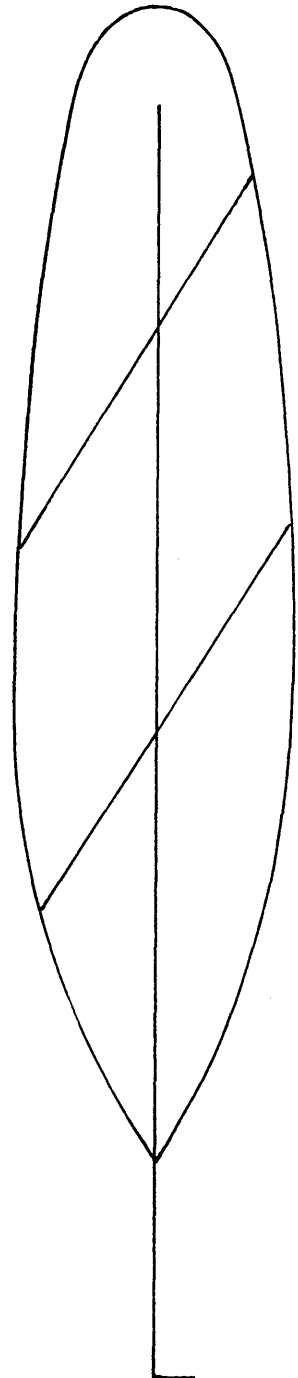
SELECT CLEAR A GRAIN BALSA AND SAND A TAPER IN A SHEET
OF .062"X 2"X 7". 6#. DOUBLE TAPER (2) SPARS TO .062"
X .075" TO .032"X .032". JOIN WITH A LONG SCARF JOINT
WIRE HOOK .012"

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

Send Order to:
Richard W. Obarski
2112 N. Halcyon Dr.
Sun City Center, FL 33573
Phone: 813-634-8683

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*

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 mousing.

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

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.		

Boeing Employees Free Flight Model Flying Club (Hawks)

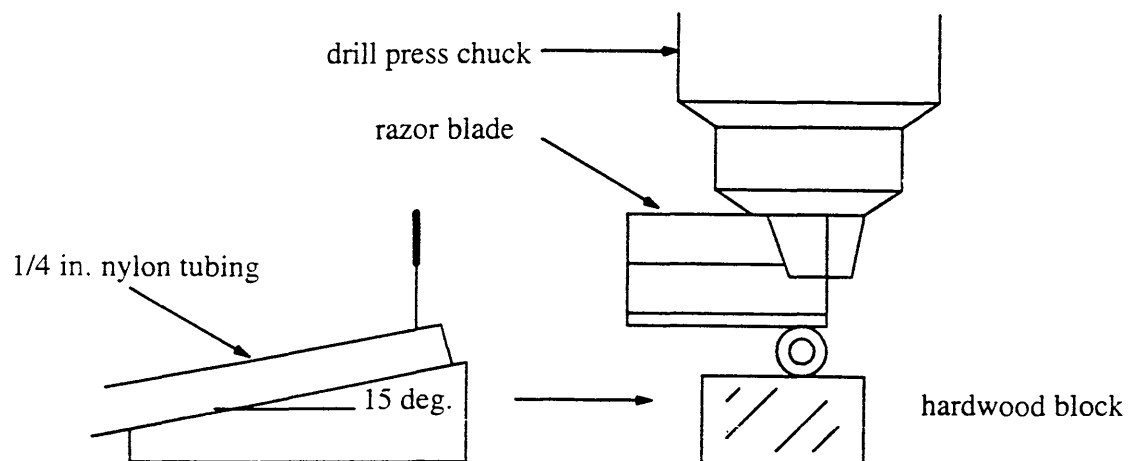
Technical Stuff:

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 $0.1214 \text{ in/gm} \times 0.72 \text{ gm} = .087 \text{ in}$. 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	May	May	May	June	No. of
	28	29	30	31	1	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

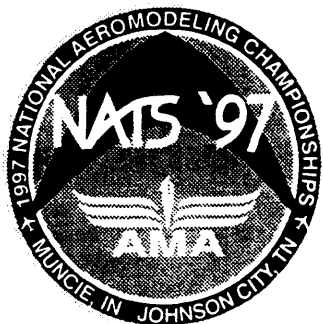
MAKE CHECKS PAYABLE TO USIC 97

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 _____



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:

- | | |
|--|--|
| <input type="checkbox"/> Double check and verify correct fees are enclosed | <input type="checkbox"/> All events are indicated |
| <input type="checkbox"/> Check(s) signed and payable to AMA | <input type="checkbox"/> No conflict exists in "one only" events, if applicable |
| <input type="checkbox"/> Name, AMA number, and complete address shown | <input type="checkbox"/> Team entry is in compliance with AMA rule book, if applicable |
| <input type="checkbox"/> Emergency contact information (above) | <input type="checkbox"/> Frequency information, if applicable, is complete and correct |
| <input type="checkbox"/> Have read all schedule and processing information | <input type="checkbox"/> Signature above |
| <input type="checkbox"/> All credit card information is given (expiration date, card number, card company) | |

Send registration form to AMA Headquarters, 5151 E. Memorial Dr., Muncie, IN 47302. Attn: Competitions Dept.