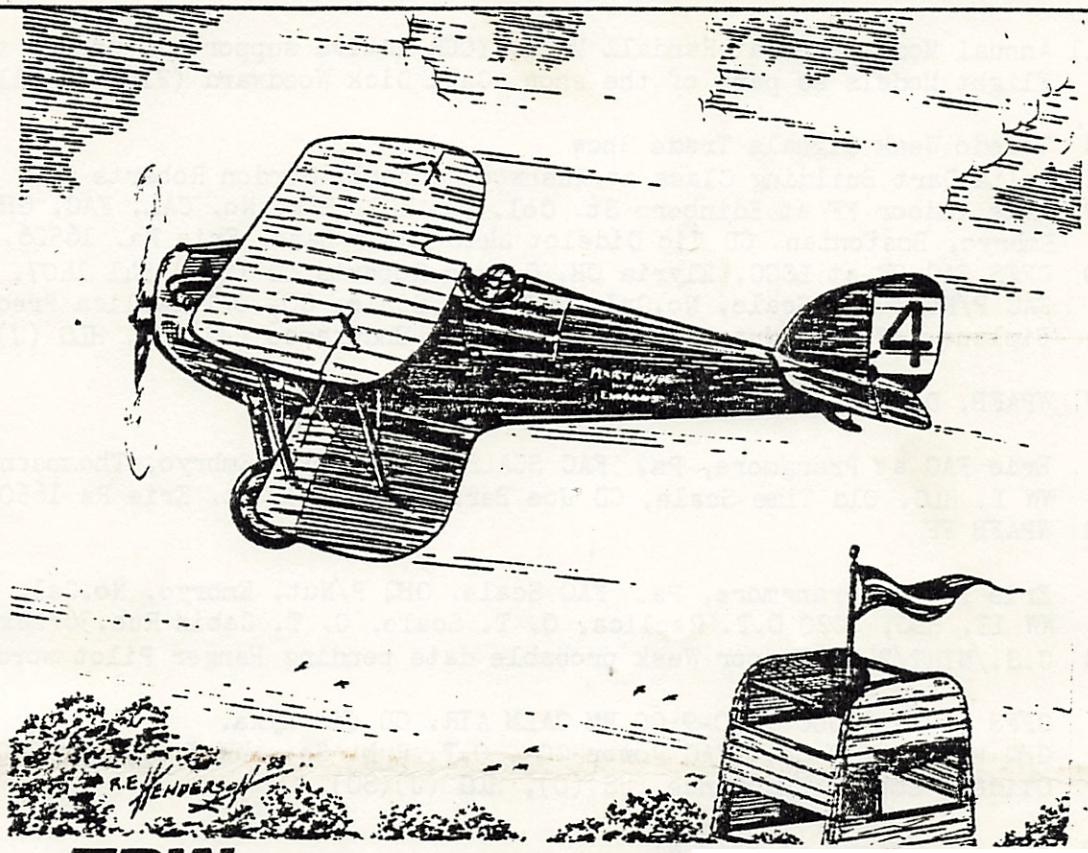
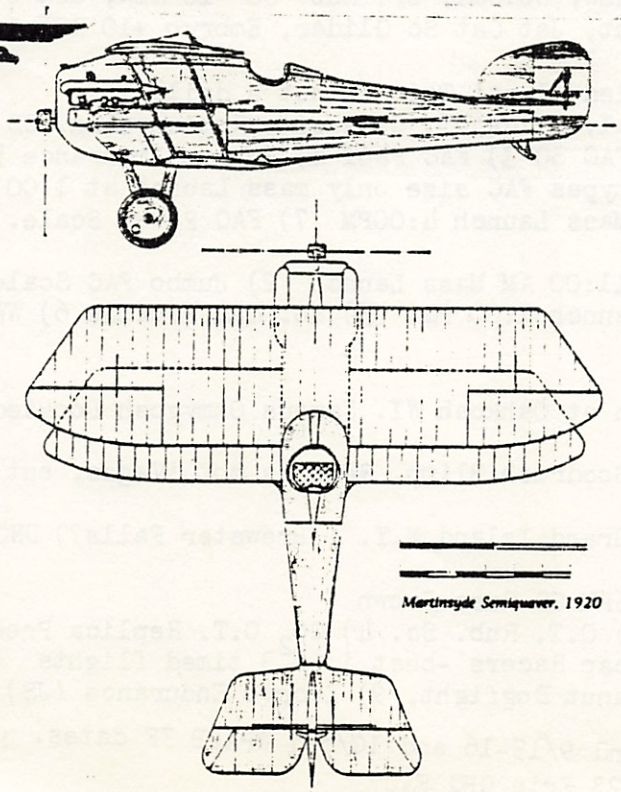
CROSSWINDS 69



TRW INC. R M. 2465B
23555 EUCLID AVENUE · CLEVELAND, OHIO 44117



2

1984 CONTEST CALENDAR

HIGH FIVE CFFS EVENTS TO FLY ARE FLYING ACES SCALE, PEANUT SCALE, EMBRYO ENDURANCE (JS)(O) AND H. L. GLIDER (J)(SO).

Feb. 19 CFFS Indoor FF at Estabrook Rec Ct'r Cleveland. M. Zand CD 524-3480
10:30-2:00 EZB, Scraps & Mites. 2:00-3:00 HLG. 3:00-5:30 Jetco R.O.G.,No.Cal, FAC Peanut, and WWI Biplane Peanut Mass Launch.

Mar.9-11 Annual Model Show at Randall Mall. YOUR active support is needed to keep Free Flight Models as part of the show. Call Dick Woodward (216) 885-1199. Thanks guys.

Apr.6-8 Toledo Weak Signals Trade Show

Apr. 26 Delta Dart Building Class at Rushwood School, Gordon Roberts CD.

Apr. 29 Erie Indoor FF at Edinboro St. Col. Pa. HLG, EZB, No. CAL, FAC, GHQ P/N, WW I, Embryo, Bostonian. CD Vic Didelot 4410 Lorna Lane, Erie Pa. 16506. Ph 814-838-3263.

May 20 CFFS FAC FF at LCCC, Elyria OH. Gordon Roberts CD (216) 541 1407.
FAC P/Nut, FAC Scale, No.Cal, O/T Rub. Scale, CO_2 O/T Replica Precision, WWI P/Nut Biplane, WW II P/Nut, WW II FAC, Embryo Endurance (JS)(O), HLG (J)(SO).

5/26-27 WPAFB, Dayton,OH FF dates.

May 27 Erie FAC at Prangmore, Pa. FAC SCALE, FAC P/Nut, Embryo, Thompson/Greve Races, WW I, HLG, Old Time Scale, CD Joe Barna 1428 W. 32 St. Erie Pa 16506 Ph 864-6933.

6/ 9-10 WPAFB FF

Jun 10 Erie FAC at Prangmore, Pa. FAC Scale, GHQ P/Nut, Embryo, No.Cal, Jumbo Scale, WW II, HLG, .020 O.T. Replica, O. T. Scale, O. T. Cabin Rub.36"Max. Lin Reichel.

6/18-23 U.S./NIRT/24hr. Indoor Week probable date pending Hanger Pilot word on site.

Jun 24 CFFS FAC at LCCC 1:00-9:00 PM CALM AIR. CD Jim Hyka.
GHQ P/Nut, FAC Sc., FAC Power CO_2, O.T. Rub. Sc., WW I Biplane FAC, Jet Cat. Sc. Glider, Embryo Endurance (JS)(O), HLG (J)(SO).

6/26-29 SAM O/T Champs at Bong WI.

July 1 CFFS FAC & Hydro FF at LCCC 1:00-9:00 PM Calm Water Meet. CD Russ Brown.
FAC P/Nut -10 ROW, FAC -10 ROW, No.Cal, O/T Rub. Sc -10 ROW, CO_2 O.T. Rep. Precision, WW I P/Nut Bipe., WW II P/Nut, Jet Cat Sc Glider, Embryo +10 ROW (JS)(O) HLG (J)(SO).

7/14-15 WPAFB FF Dates. Now Red Alert! This is not a drill :
FAC NAT'S MK. IV at Ford Oval, Utica MI. Code site Rottenville. CD vonRottensox.
Sat.1)WW II Combat 10AM 2) FAC SC 3) FAC PNUT 4) Embryo Endurance 5) Golden Age Scale 20's-30's fixed gear types FAC size only mass Launch at 1:00 PM
6) Thompson Trophy Radials Mass Launch 4:00PM 7) FAC Power Scale.

Sun. 1) Greve Race Inlines 11:00 AM Mass Launch 2) Jumbo FAC Scale 3) GHQ Peanut 4) WW I Dogfight FAC Mass Launch 1:00 PM. 5) No. Cal Profile 6) WW I Peanut 3:00PM. Entry details on flier.

7/29-8/4 EAA Annual Fly In Convention at Oshkosh WI. Famous Ohmygosh Lookiedere Birdwatchers.

8/5-12 AMA NAT'S at Reno NV. Like Goodrich Blimp, Reno is not 'Vegas, but maybe good FF.

Aug 5 Buffalo N.Y. O.T. & FAC at Grand Island N.Y. (Brewster Falls?) UNCONFIRMED.

Aug 12 CFFS FAC at LCCC 10:00 AM- 5PM CD Russ Brown
1) FAC Peanut, 2) FAC Sc. 3) O.T. Rub. Sc. 4) CO_2 O.T. Replica Precision
5) Cleveland Post War Handicap Racers -best i Of 3 timed flights 6) Greve Race
7) Thompson Race 8) WW I Peanut Dogfight, 9) Embryo Endurance (JS)(O) 10) HLG (J)(SO)

Aug 19 Erie FAC Picnic 8/ 25-26 and 9/15-16 and 10/6-7 WPAFB FF dates. Dayton FAC 8/26,10/7

Sep 9 Canton FAC 9/16 CFFS 9/23 Erie GHQ FAC

CROSSWINDS

QUARTERLY

ISSUE 69

CROSSWINDS

4909 N. Sedgewick

Lyndhurst, Ohio 441

FLAT HATTIN' TO CODE RED

Address label number is a renewal reminder for $10 CROSSWINDS contributions to Russ Brown 4909 N. Sedgewick, Lyndhurst OH, 44124 USA

A flash of red streaked through the Western fringe of the Detroiten Geschwader Sector, slipping in between flights South of Sudsville (Milwaukee), just North of Rockaforda agent 2005. Un-announced, and wearing bright red all over red cross (big!) local camouflage, a slick but strangely familiar low winger dropped flaps and gear, and MEGOW hummed in to roost with vintage birds that flock to Oshkosh.

Ah so! SCUM from Cal. del Sur Sector were detected gathering aero intelligence for the BIG comming FAC Nationals Mk.IV at Rottenville, MI on July 14 and 15, 1984. (SCUM is latest FAC Squadron: Southern California Ultimate Modelers.) The SCUM pilot tied down at a Porta-Potty and emerged in disguise as the hansome biplane and MODEL BUILDER Fernando Ramos. This clever clip of the Ramos Marquart Charger biplane as Bellanca N 6508 N was discovered and photographed for posterity or thereabouts on the cover of Dec. '83 EAA VINTAGE AIRPLANE. As the enthusiastic FAC fliers converge on N. Rottenville at the FORD Test Track in Utica,MI we may well see this same '49 Bellanca Cruseair still in Loyalist all over red marking beat up the runway to drop tissue wrapped cargo. Rumor has it that a rear bar has been installed and a motor tube will protect the pilot from excess lube. Should do real good in Jumbo 'Nes Paw? A Quarter Scale X 4 Bellanca will impress Glue Guru, and cast more shade than even der Schanz's giant Fairchild PT-19. There is no end to gum band power as the stick and tissue conveyors of elastic arts plan ahead for the FAC Nat's Mk IV! Be there. That is an order. Entry details will follow in CROSSWINDS ISSUE 70 or FLYING ACES CLUB NEWS boot drop.

Canton connection Don Assel and Bob Howard combine offerings this issue with a feature peanut scale plan by Bob Howard and photo pages from recon to the West Baden Atrium Indoor site by Don Assel. These Canton, OH wingsters also host the annual Fall FAC sweep to Canton for the pleasure of local free flighters. Don is CD, while Bob works the scale judging line and shows devotees his latest pro-type drawings. Bob has an eye for the imagineering of appealing aircraft views into flying scale plans, and has kindly offered several to us.

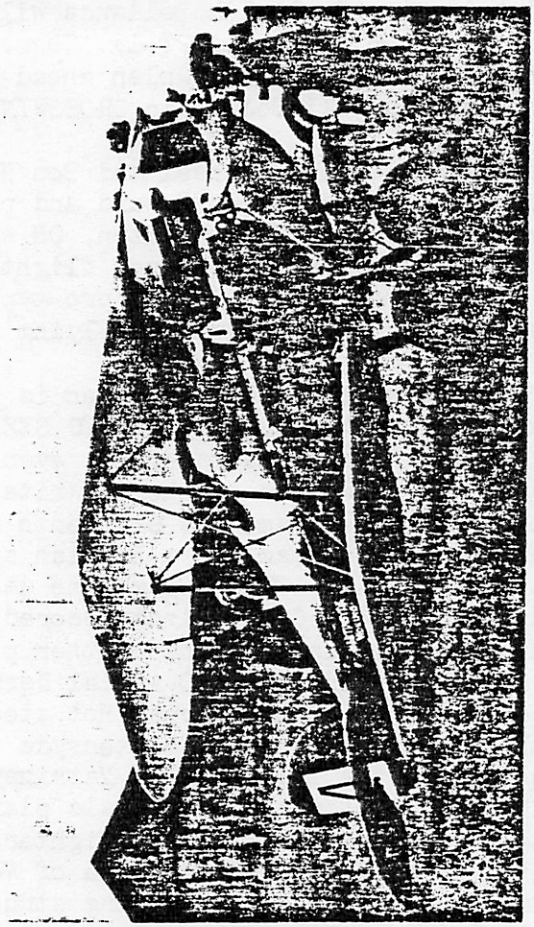
The feature Martinsyde Semiquaver is both colorful andaflyable subject. The scale reference material is mostly from THE SPEED SEEKERS book by Thomas Foxworth. Race plane enthusiasts will really enjoy this material, even at the $45 tag. Dave Pishnery will check for 1920 FLIGHT 3-views we can run here. Write in to Blue Fox Base above if you build and need 3-v. As the Semiquaver name (a sixteenth note) implies, this was a "fast note". Martinsyde test pilot Freddie Raynham set a British speed record of 161 mph on March 21, 1920 in " the little red devil". FLIGHT Magazine described it "the most beautiful outline imaginable". (This was before Count Pizana scored with a ten on his annular seat.) When Fred Raynham strained a knee in cracking another plane, his friend the famous Frank T. Courtney raced the Semiquaver in the 1920 Aerial Derby. Here Frank raced the hot biplane so fast he invented blackout in the turns. Hot steam from over heating and lash down shock chords added to the winning adventure. Martensyde characteristic clean lines with angle tip planes were developed on the 1914 era WWI Matrinsyde Scout S.1 by designer A. A. Fletcher. See Feb. '84 MODEL AVIATION for a Peanut Scale plan S.1 by Frank Scott. Later WW I Martinsyde Elephant 2 seater and fast F.1 Buzzard Fighters continued these family features. The 1918 F.4 Buzzard was the fastest combat aeroplane of WW I. The F.6 version with a shorter top span center and added fuselage to lower wing struts was raced effectively by Freddie Raynham and others. Fred's F.6 was painted a guady or vivid yellow to be dubbed "Mustardsyde" at the 1922 Aerial Derby as single seat, and 1922 & 1923 Kings Cup Races with 2 seats. G-EBDK and No. 3 were on white panels on fuselage and rudder. G-E BDK across wings was black on yellow.



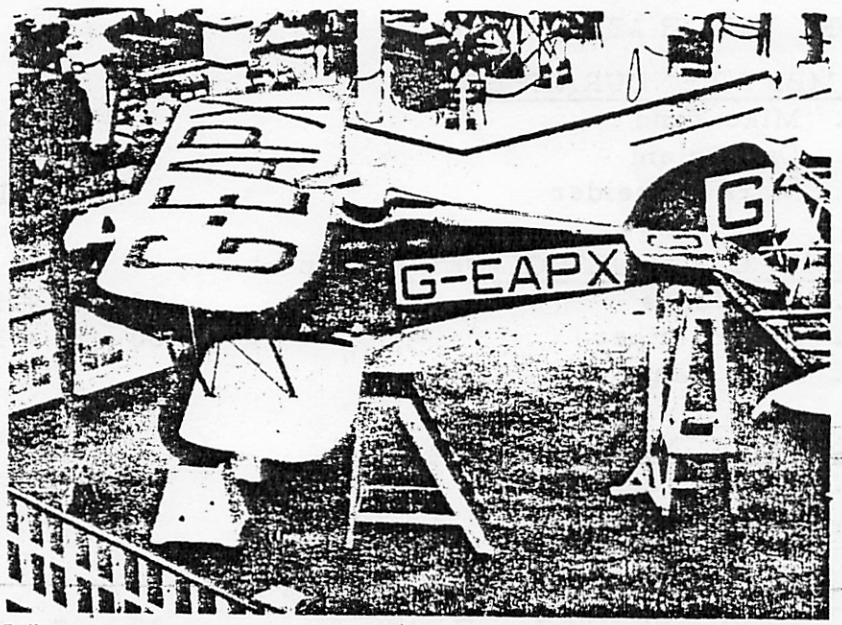
The late Frank Courtney " the man with magic hands" strokes SCUM snake and smiles at rotary cowl spun by Walt Mooney, as Warren D. Shipp cholks SSW DI at San Diego. Bill Hannan photo courtesy aviation artist Ron Henderson. Ron drew Semiquaver cover.



Frank T. Courtney, circa 1920 (MA)



Martinsyde Semiquaver, a modified pursuit plane flown by Raynham, was the only English entry. Like all French entries it was powered by a 320 hp Hispano-Suiza V-8 engine. (Musée de l'Air)



Built to advertise the tottering Martinsyde company, the little Semiquaver had minimum frontal area, and in side elevation had the typical pretty shape of George Handasyde's creations. (*Flight*)

The feature Semiquaver Peanut or 16" Walnut, FAC Power or No. Cal Profile plan may be marked with a black 4 on a white rudder panel, all white wings, and red fuselage and tail with bare metal nose panels. Alternate markings were G-EAPX in black on a white rectangle on the fuselage, G on white box panels on the rudder and both sides of the horizontal stab, and the big G-EAPX in black on the white wing. Red wheels and struts. Dark wood prop. The 1921 Holle Alula thin swept back parasol wing was a washout. Pity.

FLY PAST August 1983 article The British Warplane in Polish Skies shows a F.4 Buzzard in all over red and white stripes. The Squadron Shop on John R. Ave in Detroit MI may have copies. Look for this cover with a Vampire Jet and absolutely irresistible float Bellanca CH-300 Pacemaker CF-ATN in Alaska red tip marking with a bold black turkey stripe and black float bottoms. White over all. This plane is in the Ottawa, Ontario Canadian National Aviation Museum. FLY PAST from Sub. Dept.1, Wolthrope Rd. Stamford, Lincs PE9 2JR England is L15 ($21) overseas or nearly double that at $39 at Sky Books. Canadian Postal Money Orders printed in Pounds are a good way to subscribe to UK.

PLANES, now bi-monthly from Vintage Aviation Publications Ltd. VAP House, Station Fields, Kidlington, Oxford OX5 1LL at L7 overseas rate has both photos and 3-views of intrest. Issue No. 11 is due out Jan 1984. We wonder what great material we missed in earlier issues, and hope to see more! Commendations and thanks go 'cross the pond to Alan Carr, Frank Gardner, David Mitchell, and Barrie Pursglove for sending choice aero publications. The passion to collect and pass along scale data to needey modellers remains a high priority at the CROSSWINDS Archives. Duty calls newsletter editors to considerable correspondence at the expense of model building, but we enjoy keeping in touch all around; Thanks guys.

Did you ever get a publication collection started with issue no. 1? Just off the press is Vol. 1 No. 1 of PKC PLASTIC KIT CONSTRUCTOR from Ron Firth, PKC 22 Slayleigh Ave, Sheffield S10 3RB, South Yorkshire England for 80p or $2 to J.J. Daileda, 4314 West 28th St. Torrance CA. 90505 USA. The first issue will appeal to plastic builders and features the Airliners in Spanish Civil War markings by Bob Massey. The Iron Annie Ju 52 Tri-motor side view sketches appeal to multi engine builders. Let's see top and bottom views too Ron. Good color notes. The silver Vultee V-1 single engine looks good in red stripes. Big Russky turbo 4 AN-12 and Jet Jaguar (not a pretty green race car) also featured. As a passionate free flighter, the brightly marked prop planes appeal. Just picked up a plastic kit of the bubble canopy Spitfire just for the box art! Maybe an air brush coating will hold it all together? Fearless FAC leader Gordon Roberts grew up in the land of Spitfire, and will edit the inspired long nose rendering CROSSWINDS issue to follow. Congratulations to Gordon and bride Helen just back from California wedding. Helen is on the mend from foot surgery at the Gwinn Estate residence in Bratenal, Ohio.

CFFS OUTDOOR AT LCCC

EMBRYO ENDURANCE

1. Mike Zand	40 + 35 + 60 = 135 sec.
2. Dan Briehl	60 + 60 = 120 sec.
3. Mark Schneider	No Time

HAND LAUNCHED GLIDER (Sr-Open)

1. Tad Jones	60 + 60 + 50 = 170 sec.
2. Rudy Kluiber	60 + 51 + 38 = 149 sec.
3. Mike Zand	19 = 19 sec.

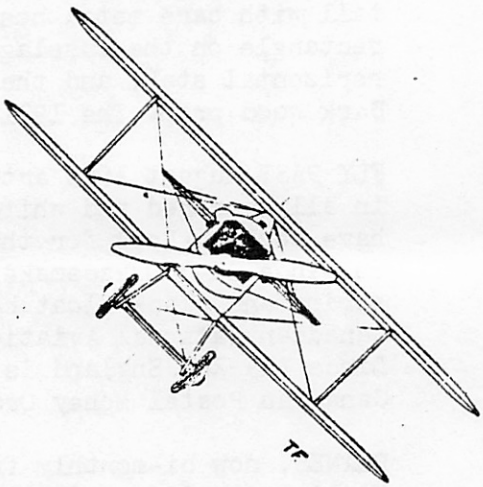
HAND LAUNCHED GLIDER (Jr.)

1. Robert Zand	20 + 13 = 33 sec.
2. Jason Hart	9 + 5 + 5 = 19 sec.

NO. CAL (Profile)

1. Dan Briehl, Pilatus-Porter	28 + 67 + 36 = 131 sec.
2. Russ Brown, Tailwind	60 + 38 + 29 = 127 sec.
3. Andy Medovitch, Folkerts SK-3	Att. + 3 = 3 sec.

Warm with windy weather. Better in Morning.

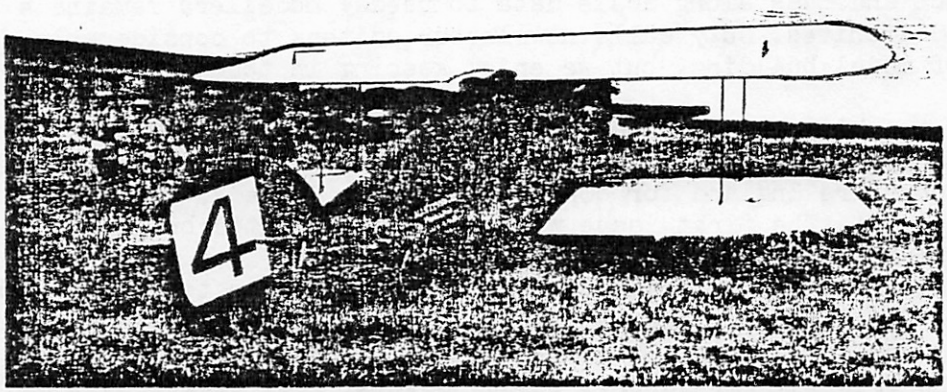


FAC GHQ ORIGINAL PEANUT SCALE

1. Mike Zand, Dayton-Wright	465
2. Dennis Norman, "Goon"	383
3. Gordon Roberts, Lacy Mio	345
4. Dan Briehl, Nin-Schev. IS4	345
5. Paul Dietz, J-3 Cub	329

FAC RUBBER SCALE

1. Dan Briehl, Nin.-Schev. IS4	126
2. Dennis Norman, P-51D	106
3. Mike Zand, Suzy	58



Two views of Martinsyde Semiquaver at Etampes for the 1920 Gordon Bennett race (MA)

INDOOR STUFF PART-2

BY LARRY LOUCKA

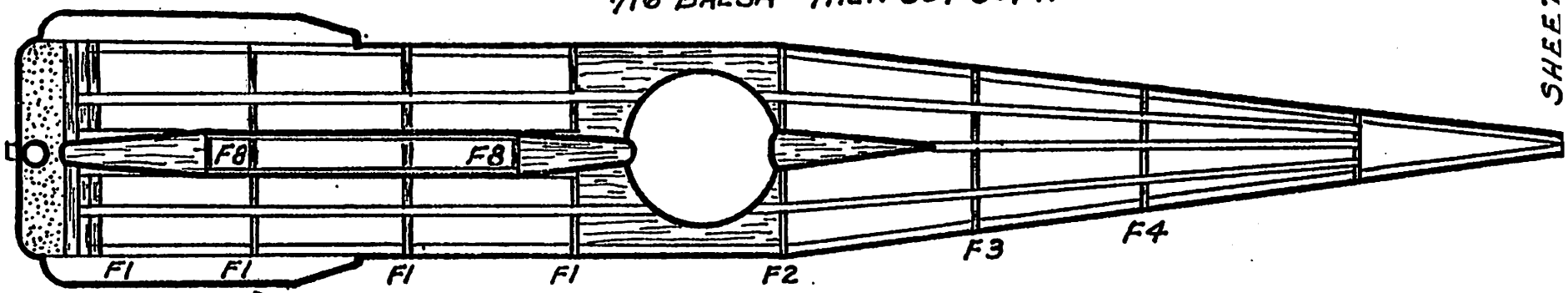
For the Standard Pennyplane event I have used two variations of the Banks Novice design. The first is a monoplane I call the "Biggie". With the prop shown, it has an impressive, almost straight up, initial climb. The built up prop is a rarity on models of this class. I have a suspicion that they distort less than an all balsa prop, as I can swing more stated pitch than most and still have a good climb. At the '80 Nationals this plane and prop combination would hit the 65 foot high ceiling of the University of Cincinnati Fieldhouse in less than 50 seconds with turns backed off! It placed fourth, just a few seconds behind Gordon Wisniewski. Note that the prop features cracked ribs. (No, I did'nt do this just because all the Scale guys in the CFFS build their wings with cracked ribs!) The advantage in this application being greater uniformity since one is cutting the ribs off of a single strip instead of down the width of a sheet. I usually make the blades for a prop such as this out of only three strips, one for the ribs and one for each outline. Using this method, the ribs become progressivly lower in camber height towards the tip of the blade due to the taper of the spar.

Due to the fact that the props, wings and, tails are physically larger than the Novice types, the weight of the motor stick and tail boom must be reduced if the plane is to be kept within the 3.I gram minimum weight. Since these planes fly on larger sizes of rubber than the Novice models, a hollow, rolled tube motor stick and tail boom can be used. Tubular sticks have a much better strength to weight ratio than solid components. In this application, the hollow stick is ideal because both less weight and greater strength is desired.

The first step in making a hollow motor tube is to true up one edge of the "C" grain sheet, as getting the blank rectangular is one of the secrets of making a strong, straight tube. I use a heavy steel straightedge, about an I/8" thick. The cutting surface should smooth and flat or the sheet will move around when cut, giving a wavy edge. Soak the blank in hot water for ten miniutes before rolling around a circular form. Hobby shop Brass or Aluminum tubing is excellent for rolling sticks I2" long or less. While the blank is soaking, cut a piece of light weight Silkspan slightly longer than the blank and about three times as wide. Wet the form with saliva or water and attach the edge of the tissue to it, smoothing out any bumps and wrinkles. Lay the form, tissue side down on a flat smooth surface. Roll up the tissue once around the form by pushing the form towards the ends of the tissue with the finger tips. Then position the blank on the tissue as close as possible to the form. Finally roll the form untill the end of the tissue is reached. If you're in a hurry, put the whole mess in an oven for I0 or I5 miniutes at 200-250 degrees F. To glue the seam I use a quick drying glue such as Duco thinned with acetone in an IMS or Micro-X glue gun. Starting in the center, I squeeze the two edges togeather, making sure that the edges are even, putting a dab of glue on the closed up area. I then wipe over the glue with my finger, removing the excess and forcing the remainder into the seam.

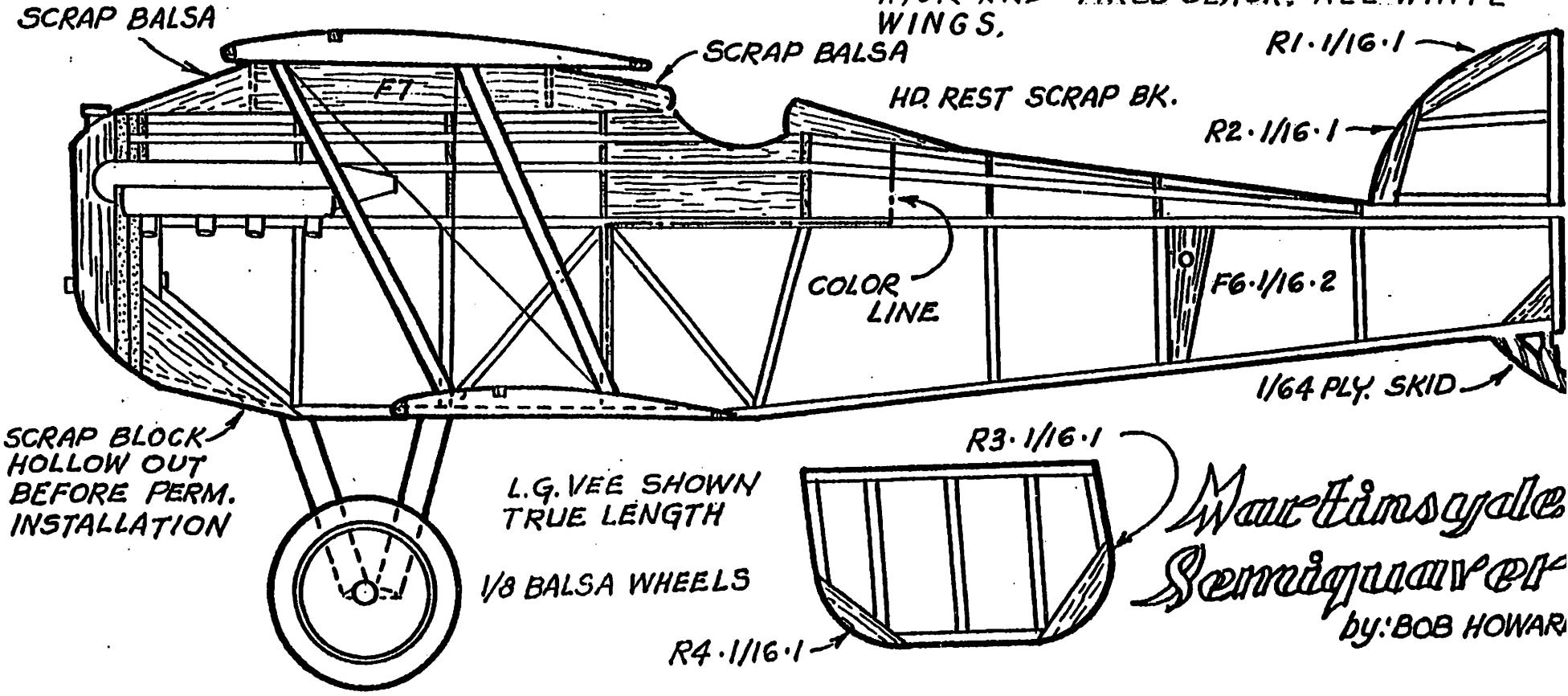
C1 · C2 · C2

FILL IN BETWEEN STRINGERS
IN THE COCKPIT AREA WITH
1/16 BALSA··· THEN CUT OUT HOLE



BUILD-UP THE V8 ENGINE
FROM SCRAP BALSA

COLOR SCHEME : ALL RED EXCEPT
FUSELAGE FORWARD OF COLOR LINE
IS ALUMINUM, STRUTS WOOD, RADI-
ATOR AND TIRES BLACK. ALL WHITE
WINGS.



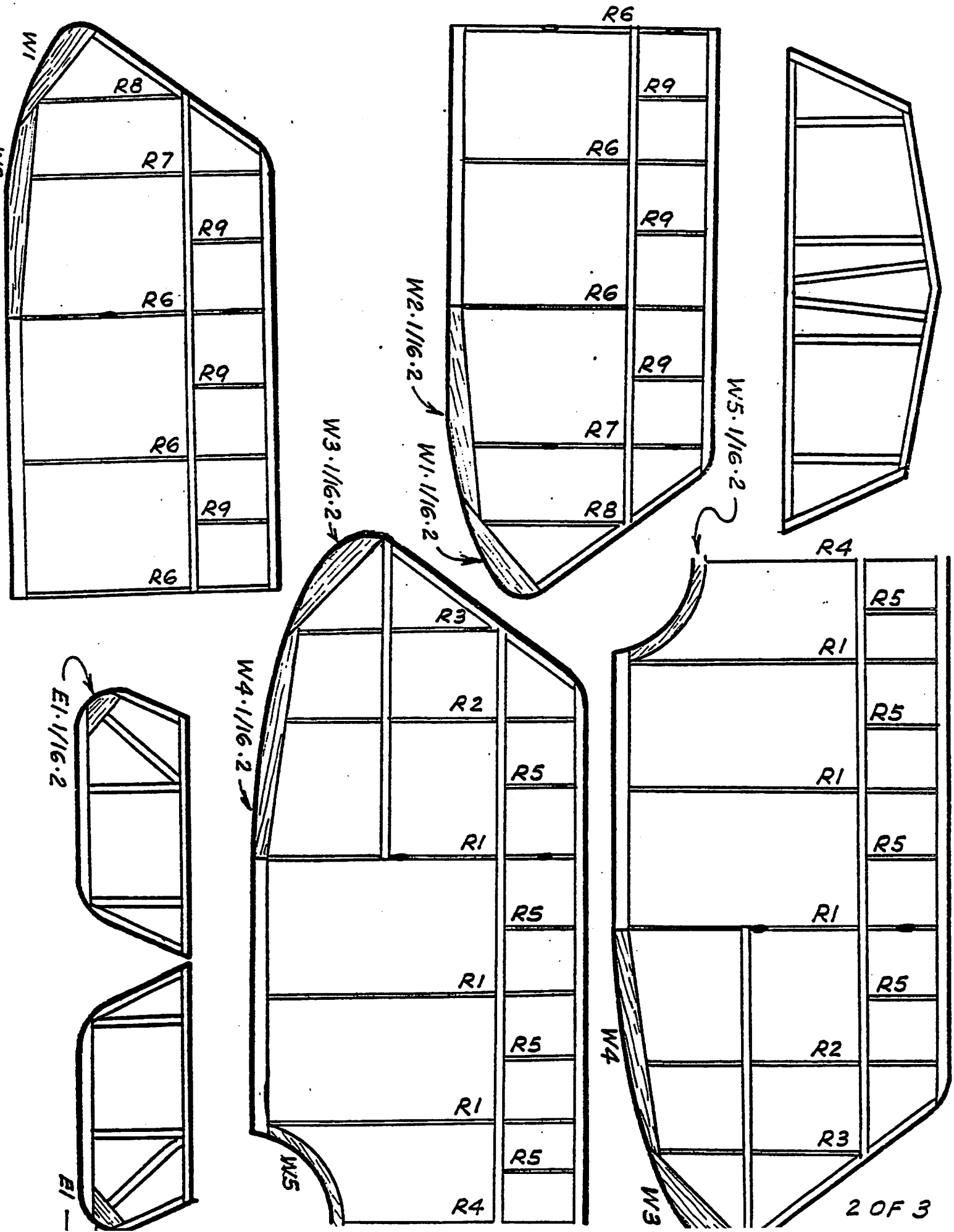
Martinsyde
Semiquaver
by: BOB HOWARD

Hold untill dry and the repeat the process untill the entire seam is glued. After finishing the seam it's a good idea to carefully inspect the seam while squeezing the sides of the tube gently to verify that the seam is glued along its entire length. The tube will fail if there are gaps in the glue. I might add that the weight of my motor sticks dropped dramatically after I started using the the very fast drying glue. Apparently one is using much less glue.

The next step is to install the vertical bulkheads in the ends of the tube. I usually use remnants of the sheet that the motor stick was made from. Run the grain vertical and make them about I/2" long, For maximum strength it's important to make sure that the lengthwise edges of the bulkheads be parallel and that the width be just right so that the tube is'nt distorted when the bulkhead is installed in the tube. I usually set the bulkheads in place with Duco and then for extra strength add a little gap filling Super Glue along the joint. The last step is to add the rear hook and front cap. I usually cut the outer end of the front bulkhead to a 45 degree angle before installing it in the tube, this gives the tube some support when the end is cut for the cap. I install the cap with the grain running horizontally to minimise the tendancy one's fingers have to squeeze the front of the stick when handling the model. When attaching the thrust bearing, be carefull that the bearing is centered on the bulkhead. A good way to check the location is to hold the tube up to a strong light. At the I980 West Baden Meet two of my most promising models were destroyed because this vital step had been omitted. Later inspection revealed that the thrust bearings had taken little rectangles of wood out of the body when they pulled out <u>alongside</u> the bulkhead.

Rolling a tapered tail boom requires a little different technique due to the fact that the edges of the blank are not parallel. For a short boom such as a Pennyplane, a tapered form will have to be made as none of the commercial forms available have the right taper. A piece of I/4" square hard balsa or spruce about 8 I/2" long is required. To taper it, first sand the sides down to 3/32" on the small end. Then sand the corners off, making the whole length round and smooth. A couple coats of dope will help keep out the moisture.

The boom blank should be cut I/I6" narrower than the motor stick blank at its largest end so that the boom will plug into the motor stick when the body is assembled. To roll the boom cut a piece of Silkspan about 3-4 times wider than the respective ends of the blank. I" long pieces of I/4" drafting tape are attached about every 2" along one edge of the Silkspan. Turn the paper over and position the untaped edge so that it overhangs your table about I/8" and that the tape is sticky side up. Place the blank so that it's centered on the paper. Place the form down centered on the blank. Then roll the form off the blank toward the overhung paper. Attach the


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W5·1/16·2
W3·1/16·2
R4
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R5
R1
W4·1/16·2
E1·1/16·2
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R5
W5
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W4
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R3
W3
E1
2 OF 3

the overhang to the form with saliva and roll back towards the tape. This method was shown to me by Dave Rigotti and I find it to be the most foolproof way to roll a boom. Bear in mind that during all this rolling that the form will move in an arc due to its taper.

Most people use plastic films such as Micro-lite to cover Pennyplanes as they are somwhat lighter than Condenser paper and are not affected by changes in temperature and humidity like the papers are. I use either Micro-X or IMS Condenser Paper Cement to attach it to the flying surfaces. This material will run in one direction when torn. Apply it with the "grain" running spanwise, just like Jap Tissue. I usually use a new double edge razor blade for trimming.

So far the ultimate configuration for the Pennyplane event has been the Biplane. Due to the length restriction, a really wide wing chord monoplane becomes too short coupled to fly well. The Biplanes can be somewhat tricky to fly and, are not in their element if the air is turbulent. Ideally, one should have models of both types. I made a Bipe by simply making three Banks Novice wings. One with a 2% airfoil for the stab and, two with a 3% airfoil for the wings. Originally the stab tips were at a 60 degree angle. Later they were brought down to the same angle as the wing tips, (2"). Generally, the most sucessfull Bipes have a large separation of the top wing from the lower, the lower from the thrust line and, the stab from the thrust line. (below). Due to the high center of wing drag, some downthrust is necessary along with the 3 degrees left thrust. This eluded me for some time and I just couldent get the Bipe to fly well untill, at the '8I Nats, Dennis Jaekes pointed this out to me. It then flew well enough to take 5th place during the Meet. I might add that all five top Open Class times were taken with Bipes.

Tune in next time and we'll cover EZB.

WOOD SIZES

MONOPLANE

WING- Center section spars 9 lb. .062"sq. Tips 5 lb. .062" sq. taper to .030" x .040" Tip outline .030" x .040". Ribs .032" x .062" 6 lb. Posts .062" round HARD

STAB- Outline .062" x .032"7-9lb. Fins .062" x .032" taper to .032" sq.

STICK-.0I6" 6lb. x II/I6" rolled around a II/32" dia. rod.

BOOM-.0I5"6lb. I" taper to 5/I6" 8" long.

BIPLANE

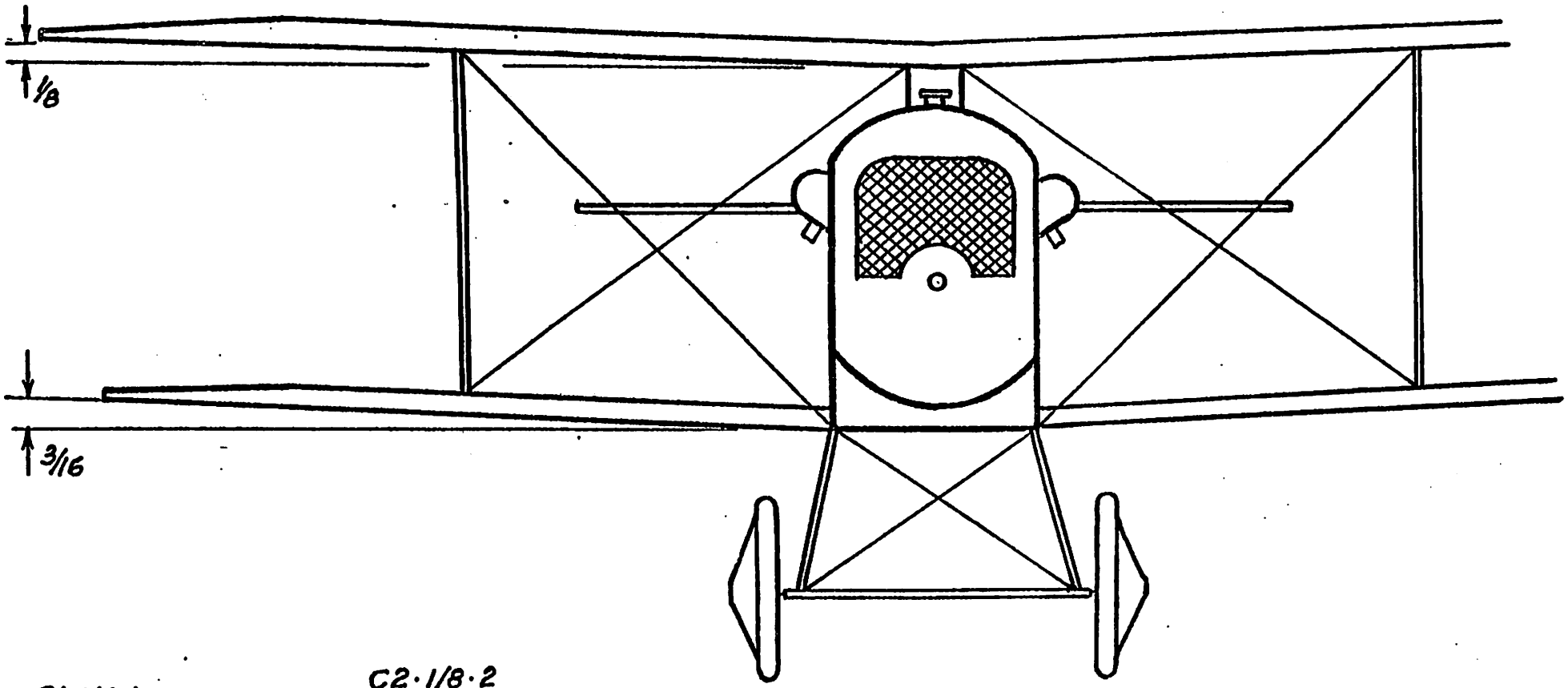
WINGS- .032" x .062" 6lb. spars tips taper to .032" sq. Ribs .032" x .062" 6lb. Posts .062" sq. HARD

STAB- Same as wings.

STICK- .0I6" 6lb. I I/8" wide rolled around II/I6"dia.

BOOM- .0I3" 5lb. I" wide taper to 5/I6" 8 5/8" long.

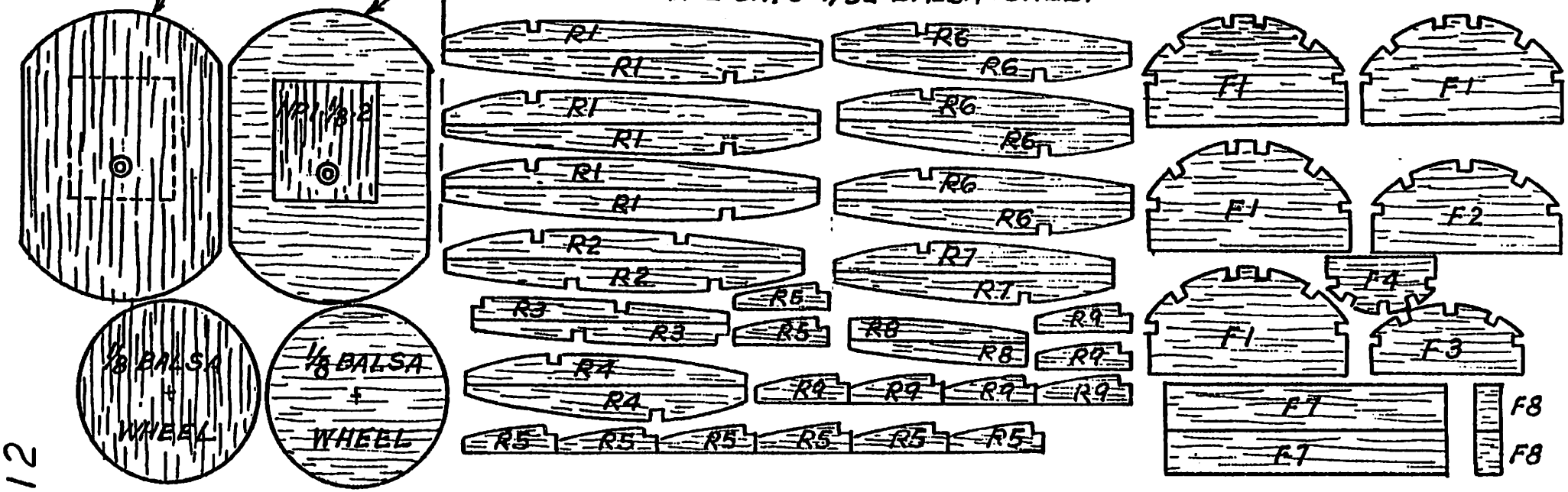
Both models use Harlan Pennyplane thrust bearings. Prop shaft centerline is I/4" away from bottom of stick. Reinforce with silk patch.

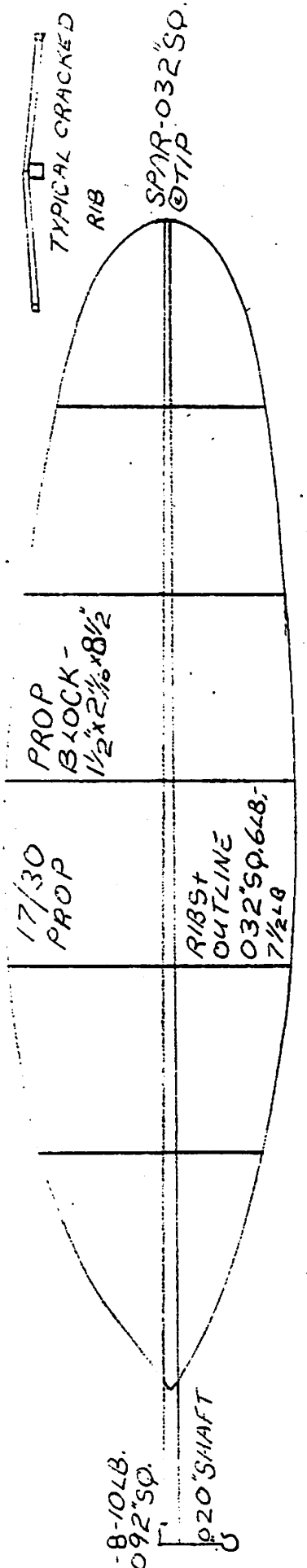


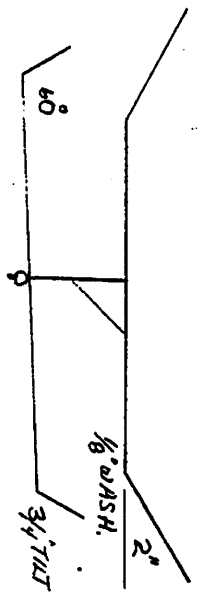
C1 · 1/4 · 1

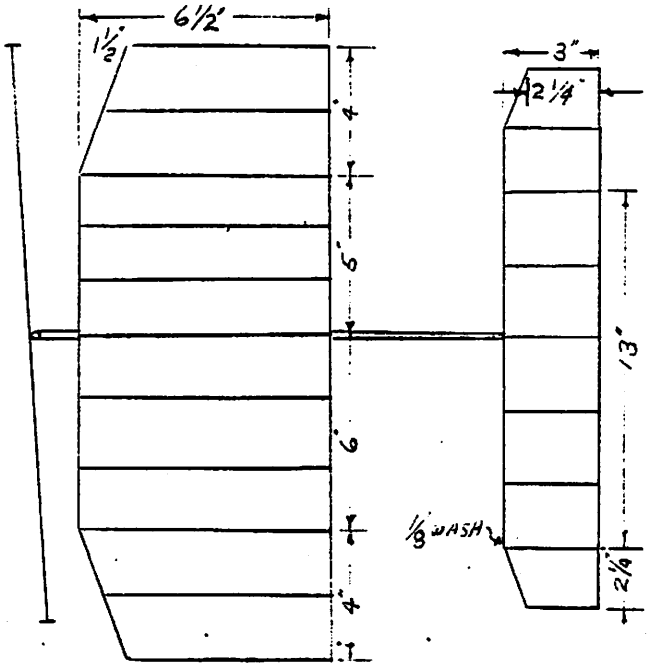
C2 · 1/8 · 2

TRACE ONTO 1/32 BALSA SHEET









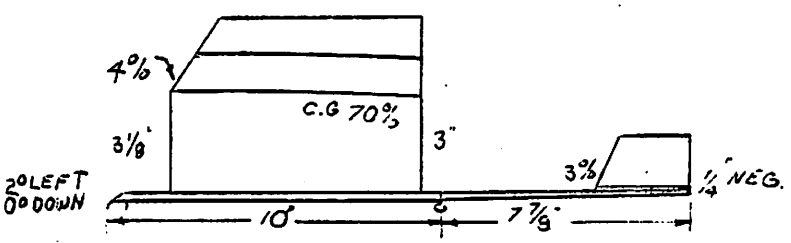
WTS.

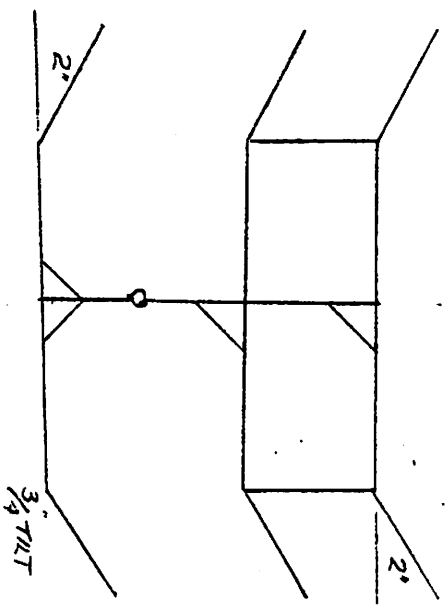
BODY- 1.3g.

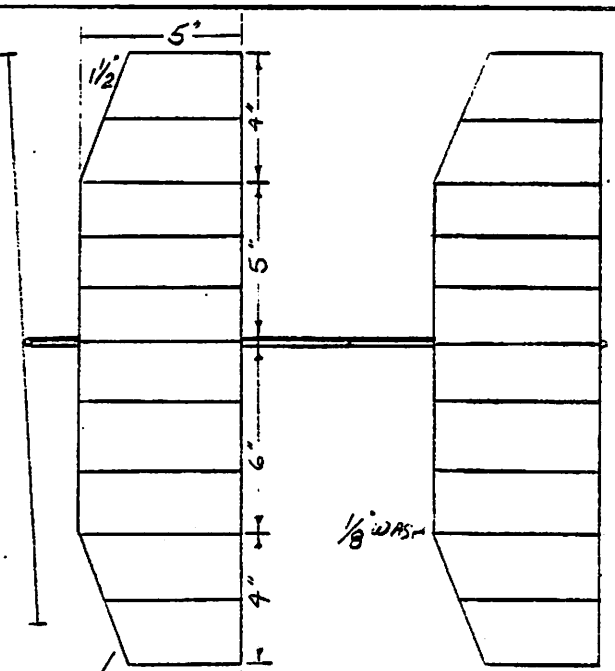
WING- 1.0g

PROP- .8g

TOTAL- 3.1g







WTS.

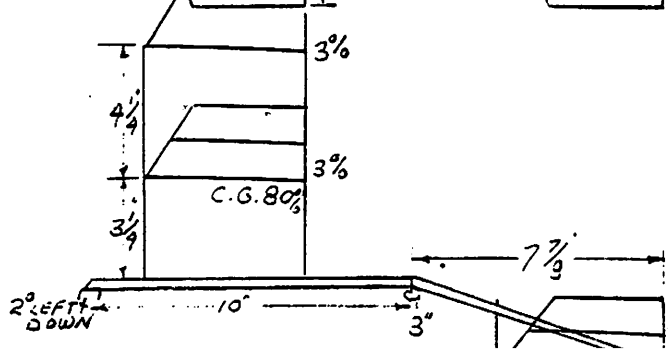
BODY- .4g

WINGS-1.4g.

STAB- .5g.

PROP- .8g.

TOTAL- 3.1g.



For those of you who missed our meet at Estabrook Nov. 6, I can only say it was an excellent day. HLG started with Chuck Slusarsic and Rudy Kluiber establishing themselves. This went on until the last 10 min. of the round when Larry Loucha started some serious flying with a 28.2. Rudy's 1HLG utilized a carbon-fiber fuselage. Excellent sink. Chuck slusarsic in third spot used a more radical approach with a small, light, narrow-chord ship with a very slow flat glide. Nice.

EZB was a runaway affair for Dave Rigotti with a two flight total of 17:19. His familar twin fin design circled slow and true and flew in very good air. Steady Larry Mzik was second followed by Joe Sova. Last time we saw Joe and Tom Sova was at the ice-house in Euclid, 1974. Dave Rigotti's 9:25 was the high time.

Scraps proved to be just that with Chuck and Larry alternately sweating it out in the iron works. Chuck thought he had it until the very last second when Larry scrapped through trouble with the lights to gain valuable height and the advantage.

Andy Medovitch won peanut with some very nice 30 sec. flights. Mike Zand couldn't keep his flight pattern the same two flights in a row and suffered for it.

HAND LAUNCHED GLIDER - Best 2 of 9

1.	Rudy Kluiber	28.8 + 28.3 = 57.1
2.	Larry Loucha	28.2 + 26.9 = 55.1
3.	Chuck Slusarczyk	25.8 + 24.6 = 50.4
4.	Dave Pishnery	16.1 + 18.0 = 34.1
5.	Don Sulsarczyk	16.2 + 16.8 = 33.0

EZB - Best 2 of 5

1.	Dave Rigotti	7:54 + 9:25 = 17:19
2.	Larry Mzik	6:51 = 7:49 = 14:40
3.	Joe Sova	5:14 + 5:49 = 11:03
4.	George Jensen	4:43 + 5:54 = 10:37
5.	Tom Sova	4:42 + 4:41 = 9:23
6.	Robert Skrjanc	4:21 + 4:36 = 8:57

SCRAPS - Best 2 of 5

1.	Larry Loucha	4:27 + 5:03 = 9:30
2.	Chuck Slucarczyk	4:22 + 4:04 = 8:24
3.	Don Scusarczyk	3:15 + 2:33 = 5:48
4.	Tom Sova	2:35 + 2:48 = 5:23
5.	Joe Sova	2:22 + 2:26 = 4:48
6.	Warren Weisenbach	1:04 + 2:50 = 3:53

PEANUT

1.	Andy Medovitch	63 + 30 sec. = 93
2.	Mike Zand	69 + 24 " = 93
3.	Andy Medovitch	68 + 18 " = 86
4.	Warren Weisenbach	68 + 15 " = 83
5.	Fred Randall	47 + 11 " = 58

Power up for FAC NATS IV

Champion of Elastic Arts George Schroedter crash tested his print out word processor with a new Champion H P catalog. Send in a dollar and see all the gum go! George will hold open the $11.95/ lb. box price until July 1, 1984 for CROSSWINDS readers. Strip widths available are 1/8", 3/16" or 1/4" X .040"(1mm). Same energy etc. as best USA brand with thin lots directed to C H P. Less 10% over $75 via UPS. Cal. add tax 6½%. Add $1.25 on orders under $12.00. $4 Canada.



*******With the Others at Chicopee**********
Mumbo Jumbo #7 from the Glue Guru, aka Leon Bennett

Salutations, disciples! Today we shall pause in our series of meditations upon the eternal truths of Jumbo. Instead, we shall ponder a recent adventure that has befallen me while serving as an FAC foot soldier.

Content in my role as an ascetic philosopher, I was busily washing my spare dhoti when a shadow fell across the cave entrance. Looking up, I was startled to see Bob Thumbsome in full uniform, his eyelids twitching furiously against the plastic goggles of his flying helmet. The usual incoherent shouted orders followed, of which I could make out but little. A packet of papers was thrust upon me and Thumbsome fled, leaving little behind but an uneasy impression that something unpleasant was impending.

The packet contained the usual false identity cards and a key. I gasped as the significance of the fake membership cards seeped into my consciousness. "Academy Melican Airplanes--Closed. Printed in Taiwan." Yes, the Others. I was to pass among the Others! To be out in the cold is bad enough, but to pass among the Others! No wonder Thumbsome was so nervous--I had just been sentenced to a living death!

The key, engraved "Dubious Quality Inn--Chicopee," was my only other clue. It was clear that behind some locked motel door was the answer to my fate. It took but a minute to grasp my spare dhoti; swinging my walking staff at a comfortable pace I set off on a trip of many miles, my mind feverishly sorting out random bits of knowledge of the Others.

The Others. They are each rich beyond dreams of avarice and to show their wealth and power, employ radio control for all the humble functions of life. Long having forgotten how to eat, they are wired with reciprocal servos to drive their teeth up and down. In the event of a glitch, they have been known to starve--a strange fate indeed. As for sex--yes, there are things that are best left unsaid.

Rich, decadent, even rotten to the core, afflicted with RC madness, crazed with plastic kits and all the sick products of a runaway technology, the Others are clearly the creation of the Great Devil. So I have been instructed by all the great FAC gurus when I was but a mere child, many years ago. It must be true. After all, would Bob Thumbsome, Dave Strutt and Russ Braun mislead me? (See Golden Groupies, Mumbo Jumbo #5 for short bios of these illustrious figures.)

And so with terror in my heart, I approached the Dubious Quality Inn. The Others were clustered thickly about this abode, each apparently speaking and smiling with the assistance of hidden transmitters. Quickly striding through the lobby, I repaired to the room number indicated on the key, swung open the door and saw revealed before me two men, and one model.

Dave Crease, the tall and dapper double-agent, stood before me. Behind him, in a small white tiled room (the Others call this a bathroom) was a seated, groaning middle-aged man, who appeared to be at stool. Averting my eyes, I quickly centered my attention on the model. With a wingspan scraping the walls, the model dwarfed even Dave Crease. Dave grinned and waved me to a chair.

"Big, isn't it?" he said imperiously.

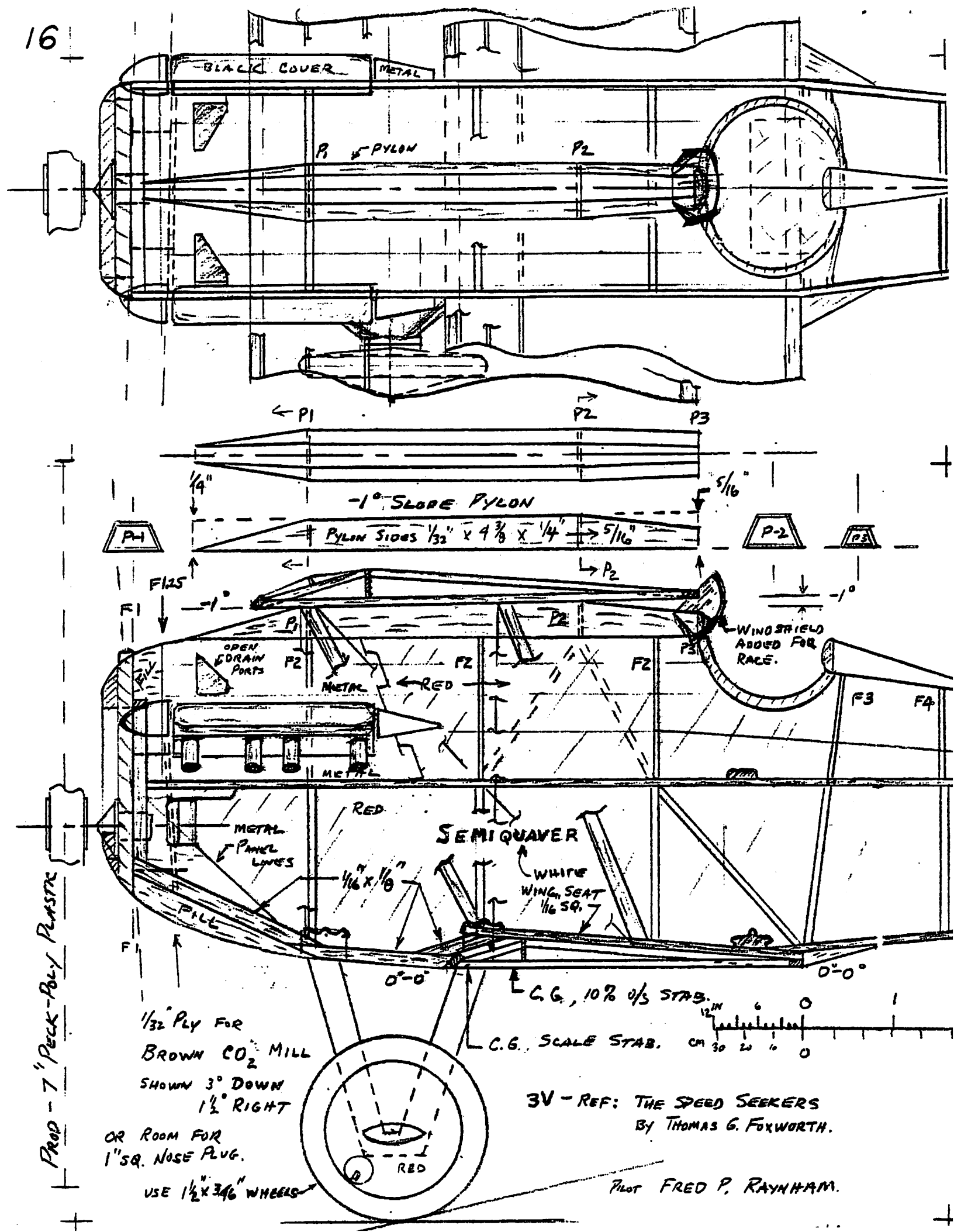
"Yes--yes" I murmured, for it is best to be noncommittal when one knows little.

Dave smiled again. "Think you can fly it?"

A challenge--perhaps even a trap? I said nothing.

Dave paused and then, shifting tactics, lowered his voice to a confidential whisper.

"The Others have image problems. Let us say that they tend to overdo RC. Let us say that in some dusty corner of their minds they yearn for the simple and spartan, much as Marie Antoinette played at being a milkmaid. How then to convince the world that they remain simple and strong? Obvious.


BLACK COVER
METAL
P1 PYLON
P2
P1
P2
P3
1/4"
5/16"
-1° SLOPE PYLON
PYLON SIDES 1/32" x 4 3/8 x 1/4" → 5/16"
P-1
P-2
P3
F1.25
F1
-1°
P1
P2
P3
WINDSHIELD ADDED FOR RACE.
OPEN DRAIN PORTS
F2
METAL
RED
F3
F4
METAL
RED
METAL PANEL LINES
SEMIQUAVER
WHITE WING SEAT 1/16 SQ.
1/16" x 1/8"
PILL
F1
0°-0°
0°-0°
C.G., 10% O/S STAB.
C.G. SCALE STAB.
1/32" PLY FOR BROWN CO2 MILL
SHOWN 3° DOWN 1½° RIGHT
OR ROOM FOR 1" SQ. NOSE PLUG.
USE 1½" x 3/16" WHEELS
RED
3V - REF: THE SPEED SEEKERS BY THOMAS G. FOXWORTH.
PILOT FRED P. RAYNHAM.
PROD - 7" PECK-POLY PLASTIC

Design and fly the world's largest rubber scale model. For maximum effect, the model must win their Nats."

"You mean the Others still have a rubber scale event?"

Dave replied, "Yes, of course--they regard it as an anachronism, to be flown by children, cretins and sentamentalists--but it does exist."

I remained confused. "But what is my role in this strange effort?"

Dave continued,"They hired some old Aero Engineer, name of Bennett, and he did a fair design job. Moth Minor. One Fifth scale. Got it built,too. But then"--and here he pointed to the bathroom--"the idiot tried to lube two pounds of rubber with castor oil. He got tangled up in the motor and in trying to fight his way out, he was saturated in castor oil. The result is... And at this point one more groan from the sad gentleman in the bathroom completed the story.

"But why don't the Others simply find another flyer?"

Dave grinned. "They have. You!"

I gasped with horror. "Me! You mean I am to fly this monster at their Nats!"

Dave's grin became sardonic, "No, not fly--you are to win their Nats."

"But I have never even seen this model before. How can you expect..."

Dave nodded sympathetically. "Yes, there will be problems. But after all, you are the Glue Guru. You will work it out somehow. Fortunately, your competition consists of Don Skole (wink, wink), myself (wink, wink), and a mere child--Walter something. As regards Don and myself--well, we won't be trying too hard. As for the kid--surely you can beat a kid?"

Somewhat reassured, but still sensing a trap, I interjected, "How old is this Walter child?"

Dave sighed. "Let's put it this way. His father seems to be about ten years old. How old can junior be?"

"I see. And there is no other flyer of stature here?"

"Well, there is Oscar Meyer, who is something of a rubber scale hot dog. And then there is..." His voice trailed off. "But let's not worry about thos characters. You claim to know Jumbo. O.K., here's a Jumbo. Now take it and win!" An element of harshness had crept into Dave's voice. "These are your orders. From the very top. Win!" His voice softened--"You have a good chance--the wing loading is only 0.64 grams per square inch; the power loading is 20%; the computer says 65 seconds dead air. A study of the winning durations at the last ten Nats indicates this model to be a likely winner." He rose and moved towards the door. "Perhaps you will not win. Accidents can happen. Luck is a factor. We are understanding and humane. We shall accept even one paltry Max as a sign of sincerity on your part."

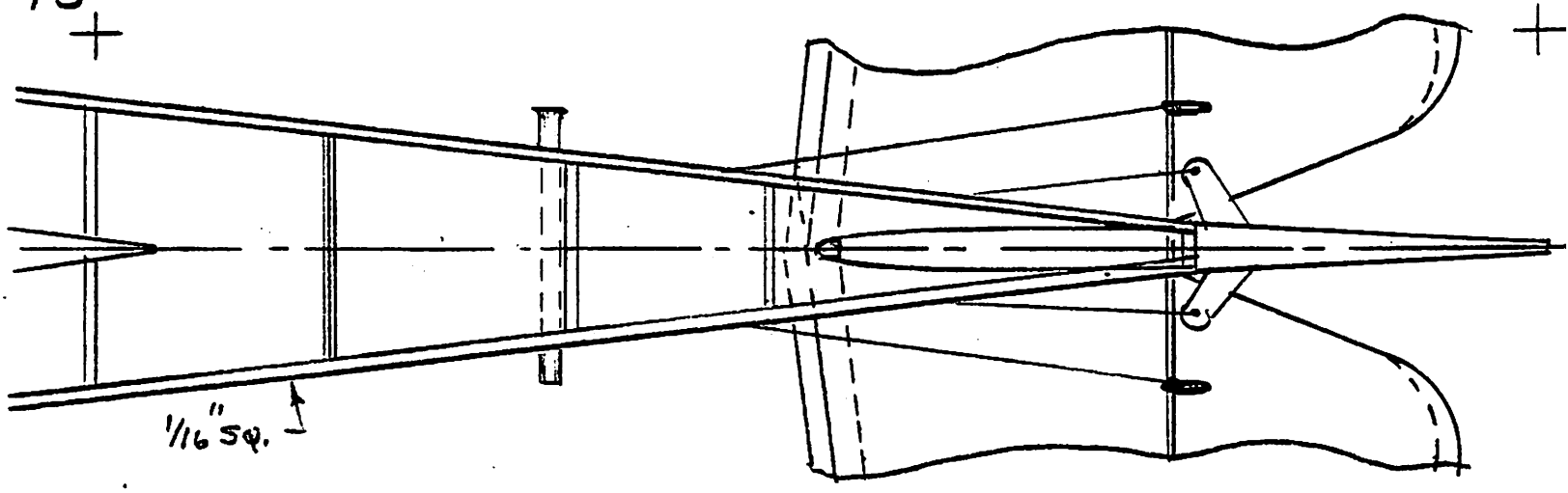
"And if I do not achieve even one paltry Max?"

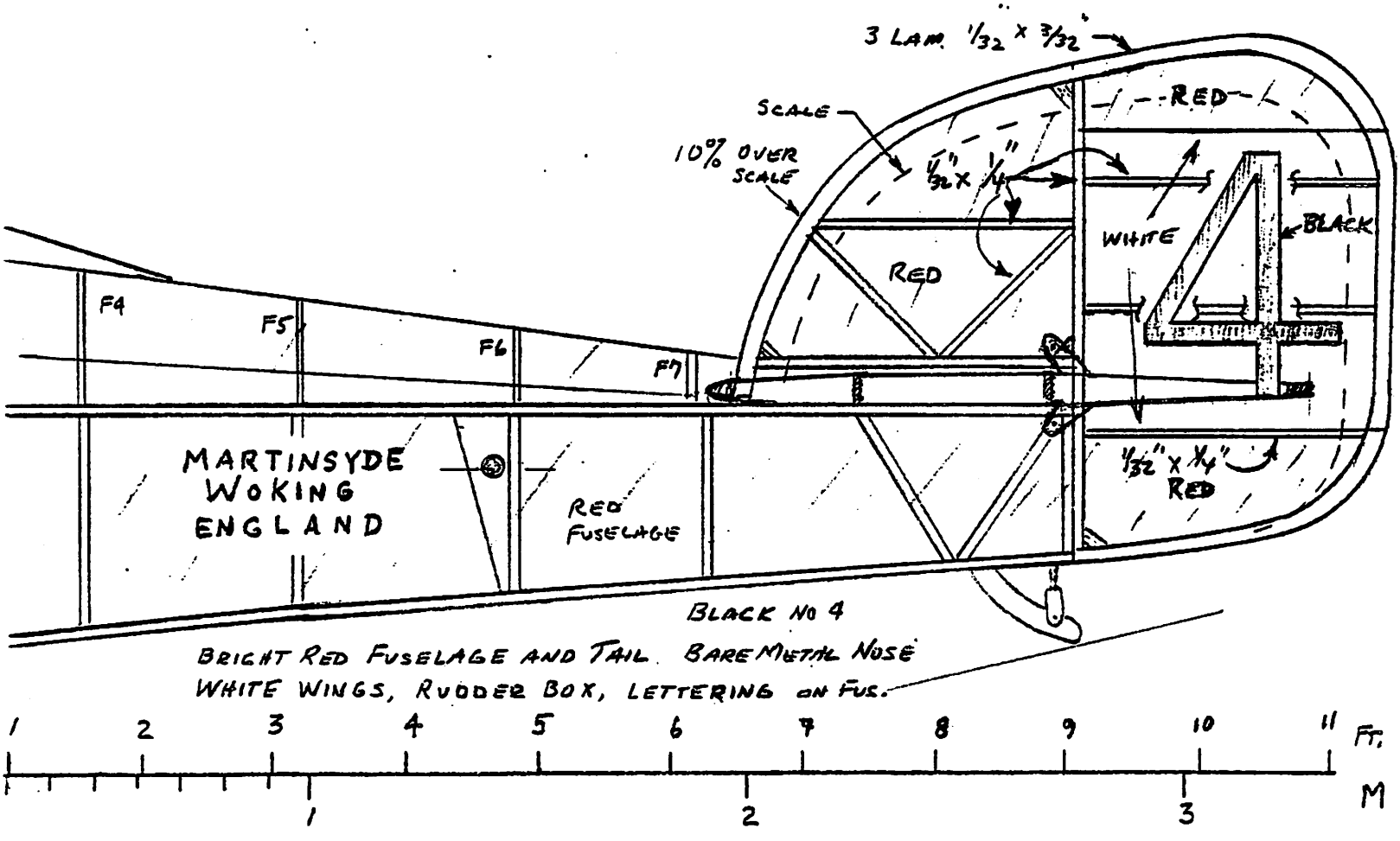
"Then my friend, it's back to Afghanistan. You know what that means."

"Yes--no more contest grade Balsa wood."

"Precisely. Think about it. But think quickly, for the event starts in a few minutes. Bob Thumbsome is outside with a moving van to take you to the field. Have a good day, or else!" And he was gone.

My eyes darted desparately about the room, seeking help. Ah--there was the scale book...I tore through the pages. Yes, a scale ruler! A quick measurement of the 3-views--One Fifth scale. Ninty one inch span. Twenty two ounces of flying weight. That would work out to about four ounces of rubber...Over to the tool box. Pre-packaged motors, good. Already lubed, good. No stuffing stick? Odd. Perhaps this sick designer might know... Low wing and yet very little diherdral. Considerable washout both wingtips, hmmm. Spirally unstable? Elevator and rudder settings clearly marked. Good. Covering material unknown to me. Cigarette cellophane? It would take many packs of cigarettes to cover this model...Still the Others are clever in certain ways, and perhaps they have a machine...The covering is certainly strong and imparts great stiffness. Good. There will be no flutter problem. The wood? Yes, one can see the purple designation "contest grade" everywhere. Fine. The wheels. Some sort of rubbery foam plastic. Perhaps two pounds per cubic ft, yet quite sturdy. A quick scraping of the landing gear with





MARTINSYDE SEMIQUAVER
1920 GORDON BENNETT RACER
300 H.P. HISPANO-SUIZA
DRAWN BY RUSS BROWN 1/1/'84
CROSSWINDS NO. 69

WAS G-EAPX
AT OLYMPIA AERO SHOW
JUNE, 1920, THEN
FRANK T. COURTNEY
WON AERIAL DERBY
JULY, 1920

a razor. Aluminum 75ST temper grade 6. Not bad. The prop. Separate blades adjustable in pitch. Freewheeling. Not quite twenty one inches in diameter. Set and glued at a pitch angle of thirty degrees at the 3/4 radius station. Corresponds to a pitch--diameter ratio of about 1.3; the traditional setting for a compromise between climb and cruise. Interesting. If the designer was desparate for climb, and well he might be (those twenty two ounces) he would be using a finer pitch prop. This pitch angle implies confidence in a normal flight pattern. Groans from the designer interrupted my thoughts. I hurried to the bathroom. Perhaps there would be some last words--some precious hint as to thrust line settings--something.

I leaned forward as the green-faced designer croaked, "Watch out for the castor oil. Divide the motor. It's too much..." And he lost consciousness. I was alone.

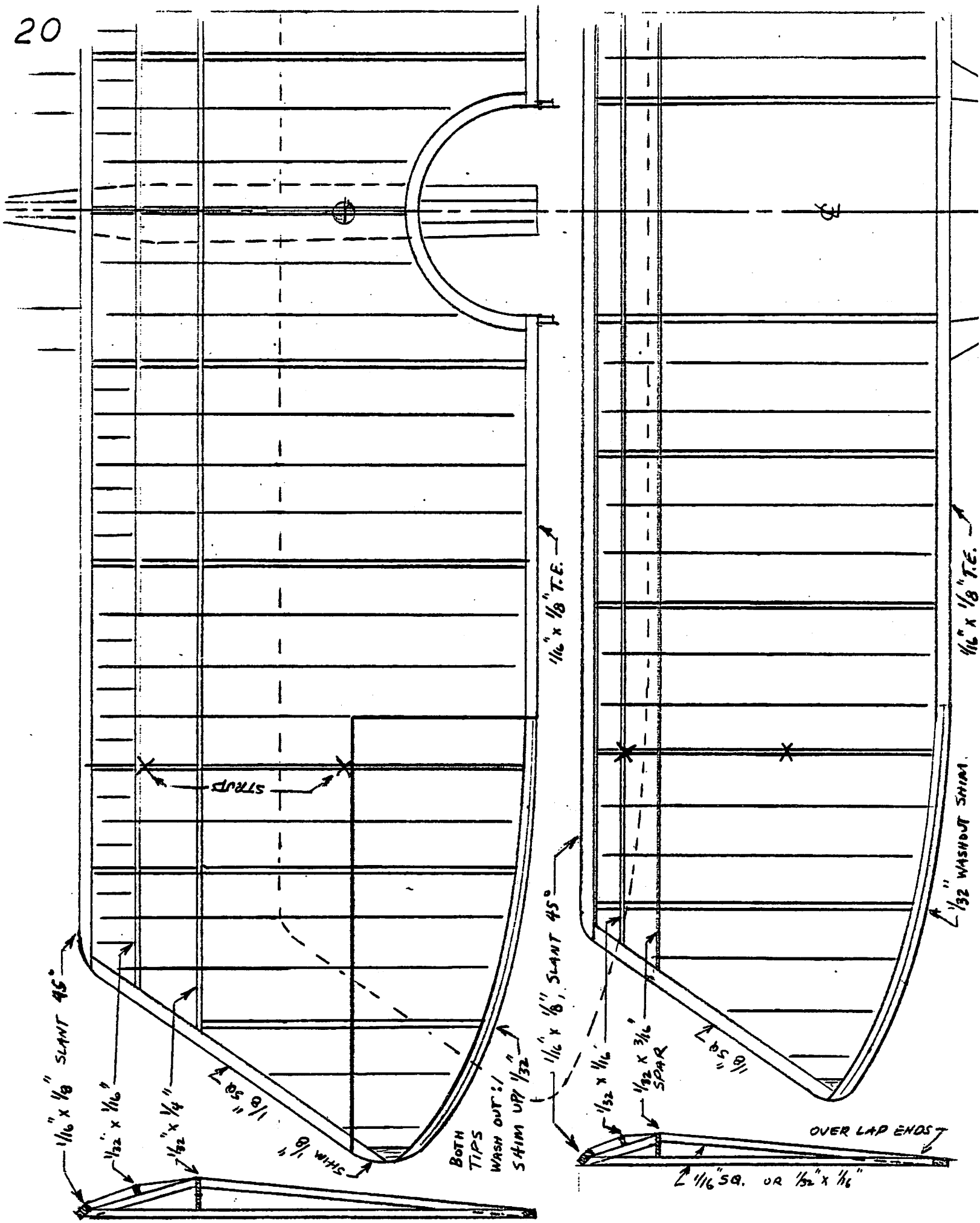
The drive to Leftover Air Force Base was made awkward by Bob Thumbsome's distaste for the Others. At traffic lights, when compelled to stop, Bob would leap from our van to bite the tires of those with Others bumper stickers. I felt that his action, while understandable, was unseemly and not in keeping with our roles. Hence when he emptied out the van at the field and departed, scattering curses upon one and all, I felt a certain relief.

I looked about and took stock. Always uncomfortable in Western dress, I found it necessary to move slowly owing to the inherent restrictions of Mr. Bennett's trousers. His shirt, now streched over my torso, was emblazoned with the curious legend "1/5 Scale or Bust;" clearly a product of an Others promotional scheme and yet bearing an uncanny relation to the truth. As I nervously scanned the milling throngs of Others I caught a glimpse of dapper Dave Crease, who had entered a biplane complete with pilot and gunner in a strong move to lose. Skole was flying a blocky monoplane with an absurdly high drag coefficient, doing his best for my cause. The runway was smooth; the air light, fluky and hot. It remained but to fly.

Two types of motor were at hand. One, labelled "cruise," contained 16 strands of 1/4 inch FAI by four feet long. The other, labelled "climb," consisted of 24 strands of 1/4 SIG by three feet long. Each dripped castor oil from every pore. I hesitated and then chose "cruise." Given an unknown Jumbo, the possibilities of disaster arising from a strong climb phase are greater than those in extended cruise. A wipeout on the first flight was to be avoided. Using my arm as a stuffing stick, I led the motor to the rear peg and secured it. A few turns on the motor to actuate the tensioner, a test glide to check the elevator settings and then on to a hundred hand turns. It is always safer to go with right thrust. As for down thrust, the CG seemed fairly far back (perhaps 35% chord). Given a cruise motor, there should be no overpowering initial nose-up surge. Perhaps no down thrust was required. And so, bit by bit, I worked towards a gentle right turn on power and a gentle left turn on glide.

To achieve ROG, a young assistant was hastily recruited. His function was to hang on to the tail wheel at the south end while I released the prop at the north end. Upon prop release, I was to flee as decorously as the cursed trousers permitted. At an agreed signal, he was to release the tail wheel--and the great model would be off. With every possibility considered and weighed, I felt a surge of confidence--winning would be but a mere formality.

Three crashes later, I viewed the issues in a more somber light. The first official (20 odd seconds, spiral dive to the left under power) may be attributable to ignorance and the second (40 odd seconds, stable but too much down throughout the flight) may be chalked up to overly conservative settings resulting from the bitter realization that spiral stability was marginal. But the third official (20 odd seconds, nose dive under power) brought tears to my eyes. Can it be that the rear peg pulled out? Yes, despite the presence of a snap ring retainer, the fiercely vibrating over-long motor had somehow dislodged the rear peg in the midst of climb out. The rear peg (a stout hardwood dowel) had smashed its way to the noseblock, wiping out any and all structure encountered on the way.



CR 2508 SHOWN, SCALE ≅ RAF 15

SH. 3

I sadly carried the tattered remains back to my tent. Afghanistan does have good weather, I reflected, and the local rancid yak butter is the best of lubes. The lack of contest grade Balsa was a problem of course, but after all models had been flown before Balsa wood was known. There was but one official flight left and the chances of getting a Max with these sorry fragments were negligible. The reasonable thing to do is simply to fold my tent and...

My thoughts were interrupted by the heavy breathing of one of the Others. My eyes focused on Mr. Hearse Flowers, their well-known hit man, the so-called "curator." Smiling pleasantly, he said "Mr. Bennett, I would remind you that we have paid you well to achieve a certain objective. Your efforts today are impressive. So impressive that we may put you in the museum. Not the model. You. Under glass. You have one flight left. Good luck--" and he disappeared into the crowd.

"But I am not Mr. Bennett" I shrieked after him. "I am really the Glue--" I stopped in the nick of time. If these milling mobs of Others knew my true identity as an FAC mentor they would tear me limb from limb. Bob Thumbsome has personally instructed me on this point.

I turned to the battered remains of the Moth Minor. Raw survival itself depended on squeezing a Max from these miserable shards! I beat my fists against my forehead in the traditional gesture of woe and frustration but succeeded only in gluing my left hand to an eyebrow in an attitude of perpetual salute. Curse that Cyano glue!

Calming myself and working only with my right hand I began the laborious job of piece-by-piece reconstruction. My mind worked with the speed of a computer as I calculated, cut and fit dozens of pieces of balsa into the complex mosaic that comprised the fuselage.

Two hours passed before I was able to drop the razor from my trembling fingers and stand. The old motor was relubed and dropped in, the wing pinions slid on, a timer was summoned, and my assistant alerted. With the patched fuselage creaking and shivering with every turn, the winds went on and on until at 675 (out of a potential 720), I could take no more and halted. One more turn and I would have a heart attack; one less and I would be deported or executed for malfeasance. This was the place to stop.

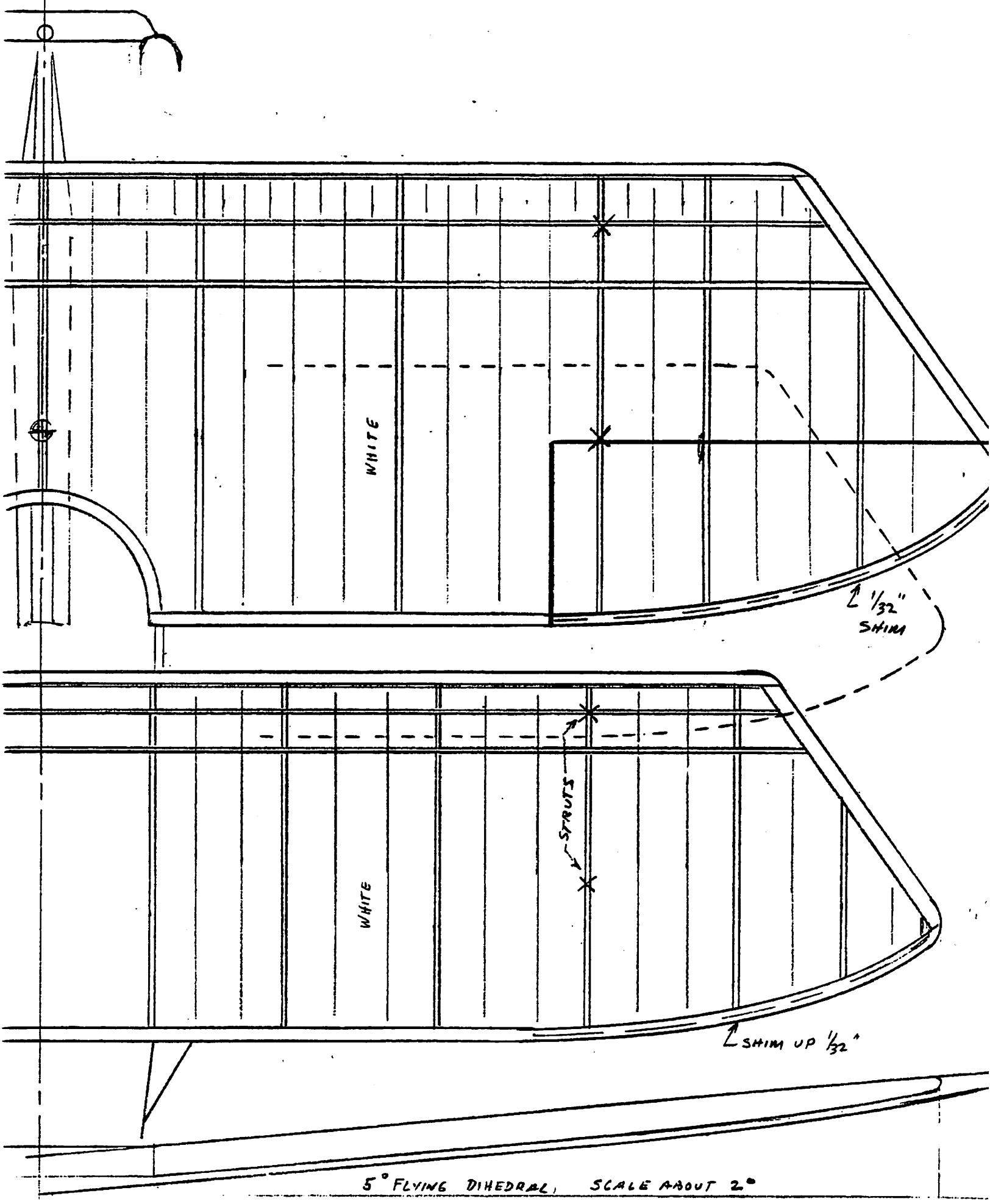
I moved the monster to the flight line followed by a seemingly friendly crowd of Others. But in their midst was Hearse Flowers holding up a glass with one hand and pointing to me with the other. And standing tall above the crowd was dapper Dave Crease, who seemed to be fanning himself with a ticket.

When out on the runway, and no longer protected from the elements by the assembled vehicles, the full strength of the wind, now risen to near gale strength, tore at me and nearly wrenched the monster model from my sweat and castor oil covered fingers. Quickly I slapped the model down to the runway and waited for a break in the wind, signifying the passing of a thermal. There was no break in the wind. There clearly would never be. This paltry Max would have to be done on turns alone.

With one last despairing look at the happy faces of the Others, I released the prop. Dancing out of the way of that enormous wing, I screamed out "Leggo" to my faithful assistant. Slowly the beast began to make headway against the wind as those four inch wheels began to reluctantly roll. Six feet-eight feet--it's off--nose up into a modest but safe climbing attitude--the prop grimly grinding out revolution after revolution as the monster slowly and steadily pulls itself up to thirty feet--downwind turn--flat and safe--continues to climb--every foot is hard-fought--now forty feet--into cruise--way down the runway--better run, the wind is really fierce--still holding thirty feet--circling the control tower as it requests permission to land--on freewheel now--it's coming in--it's 93 seconds! A paltry Max!

****

And so I didn't win. But as I look around my comfortable cave, and check the piles of contest grade balsa wood strewn everywhere, I realize winning isn't all that important. Surviving is what counts.



5° FLYING DIHEDRAL, SCALE ABOUT 2°

*****Phugoid Philosophy Phor Phlegmatic Phlyers****
Mumbo Jumbo #8 from the Glue Guru, aka Leon Bennett

Salutations, disciples! Today we shall begin our meditations upon the issue of stability, that most difficult, delicate, and crucial of matters. Yes, in this valley of tears, the tiniest deficiency of right-side-upness spells doom. Given the low state of scale model stability, it is not surprising that the collective subconscious fantasy of "flying over tall grass" occupies so many of our dreams. Alas, such fields exist only in the sick imaginations of cringing "how to" authors as they desperately seek to avoid the inevitable crunch awaiting their miserable creations.

Those of us who are strong and pure at heart well realize that only by meeting the issue of stability head on can we pass the ultimate test--flying over concrete on a windy day. Currently our knowledge of stability is so meager that those of us willing to venture upon such a trial are best advised to bring more brooms than models.

Yet, when we turn to the works of the masters on this subject (Zaic, Grant, McCombs, Zier--see references) we receive but mysterious hints and strange rituals involving the hanging of cardboard effigies. We are enjoined to use exaggerated amounts of tail area to "keep it stable" and then to move the CG back to prevent too much static stability. We are told that downthrust is our most effective weapon in the fight for stability; and then Zaic, in a stunning blow-by-blow saga, demonstrates conclusively that downthrust can be of little avail. (I was--sob--unable to touch a bowl of my beloved Pakora for many weeks after that sad tale.) In short, we emerge from our studies not only ignorant of solutions to the problem of stability, but lacking even in an understanding of what constitutes the problem. (Admittedly, Zaic comes extremely close.)

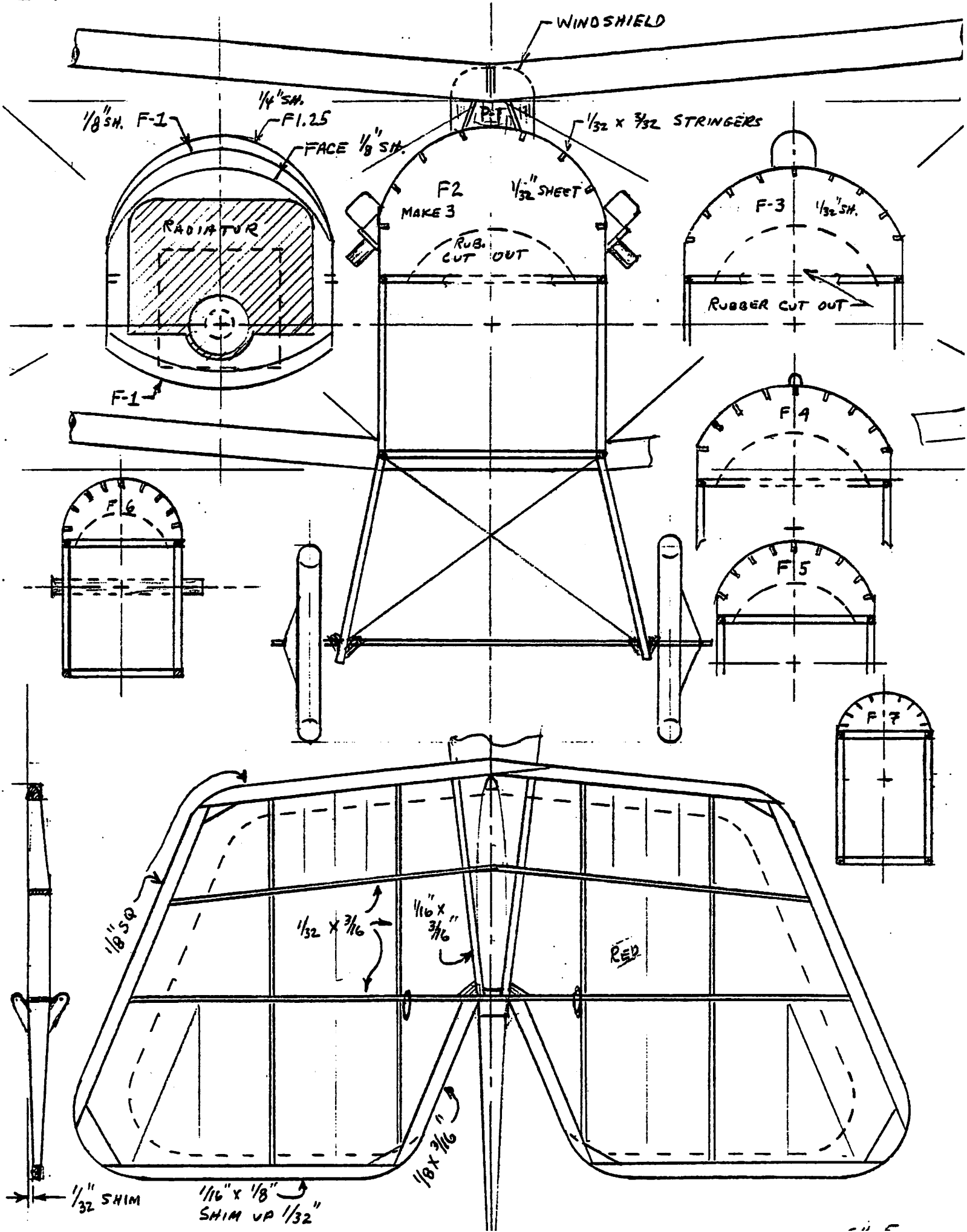
Let us start by examining the simplest and clearest of all stability problems--unwanted zoom. At every mass launch contest, some entrant, pushing his model beyond its normal flight envelope, will watch in horror as the model zooms up in a near vertical climb, hangs for a moment, flips over to point straight down and then either bores straight into the earth or performs a series of swooping stalls ending in a crash. In the previous round or in prior test flights, the same model has behaved well. Yes--something terrible has happened--but what?

To answer this question we must return to the misty land of high school physics, first-year university calculus, and the mathematical modelling of W.F. Lanchester. Given half credit for the theory of flight (a team of German applied mathematicians got the other half credit) Lanchester's genius produced the bound circulation concept that is at the heart of any coherent flight rationale. In what follows we will present Lanchester's views on zoom as filtered through B. Melvill Jones, the great English aircraft dynamics worker. See references.

My end of this affair is to leap in whenever these worthies say "it is obvious that...". It is <u>never</u> obvious to me and possibly not to you. Hence some of the humble dung shovelling efforts are mine--but the concepts, and some are brilliant, are those of Lanchester.

And so let us enter the strange cannon ball world of high school physics. In this world neither left nor right (yaw) exists; nor does roll, for we have chosen to live entirely within a vertical plane. Within this plane any sort of continuous trajectory is acceptable, so long as it meets our other constraints. Of these the principal one is that gravity exists and that energy is conserved. In other words a fallling object will gather speed and this gain in velocity can be traded at any subsequent time for an equivalent gain in altitude. We are in a roller coaster world here where a dive can be readily converted into a zoom.

Next let us consider our model airplane. We will assume it to be well trimmed to fly at some velocity above stalling speed. We will assume that the tail area is generous, the C.G. properly positioned, and the angle of longitudinal dihedral has been carefully set to assure superb (even perfect)


WINDSHIELD
1/4" SH.
1/8" SH. F-1
F1.25
FACE 1/8" SH.
1/32 x 3/32 STRINGERS
F2
MAKE 3
1/32" SHEET
RUB. CUT OUT
RADIATOR
F-1
F-3
1/32" SH.
RUBBER CUT OUT
F4
F6
F5
F7
1/8" SQ
1/32 X 3/16
1/16" X 3/16"
RED
1/8 X 3/16"
1/32" SHIM
1/16" x 1/8"
SHIM UP 1/32"

static stability at our chosen slow flight velocity. We will assume that there is no hesitation (lag) in the tail action; in other words, the tail acts instantaneously to maintain the wing at some fixed and large angle of attack no matter what path the wing happens to be following. This last assumption implies that there is a negligible moment of inertia about the pitching axis. Next we will assume that Zaic's circular airflow, while real, does not influence the outcome; in other words the model is so small as compared to any possible flight path that the pitching moment produced by the angular velocity of pitch is negligible. Finally let us assume that the thrust is precisely equal to the drag at all times.

Then if we call V the velocity at the C.G. and t, the total elapsed time of maneuver, we note from high school physics

$$V = gt \qquad (1)$$

where g is the acceleration of gravity

if we call Z the distance of the C.G. below some datum line that is fixed in space, we have, also from high school physics,

$$Z = \tfrac{1}{2} g t^2 \qquad (2)$$

from (1) we have $V^2 = g^2 t^2$ (3)

and from (2) we have $t^2 = \frac{2Z}{g}$ (4)

Combining (3) and (4) $V^2 = g^2\left(\frac{2Z}{g}\right)$ (5)

or $V^2 = 2gZ$ (6)

As we are flying at a constant angle of attack, the lift L is sensitive only to (directly proportional) the same V^2 term. In other words,

$$L = KV^2 = K\,2gZ \qquad (7)$$

For a constant, straight and level flight trajectory at some level Z_1 below the datum line, it follows from (7)

$$Z_1 = \frac{L_1}{K2g} \qquad (8)$$

Here the lift must be fixed and therefore equal to the weight of the model or mg, where m is the model mass. Hence we define that value of lift, L_1, which is just capable of supporting the model in a straight horizontal trajectory as $L_1 = mg$

In a more general sense, any lift L is proportional to V^2, as shown by (7), hence we can write the following ratio

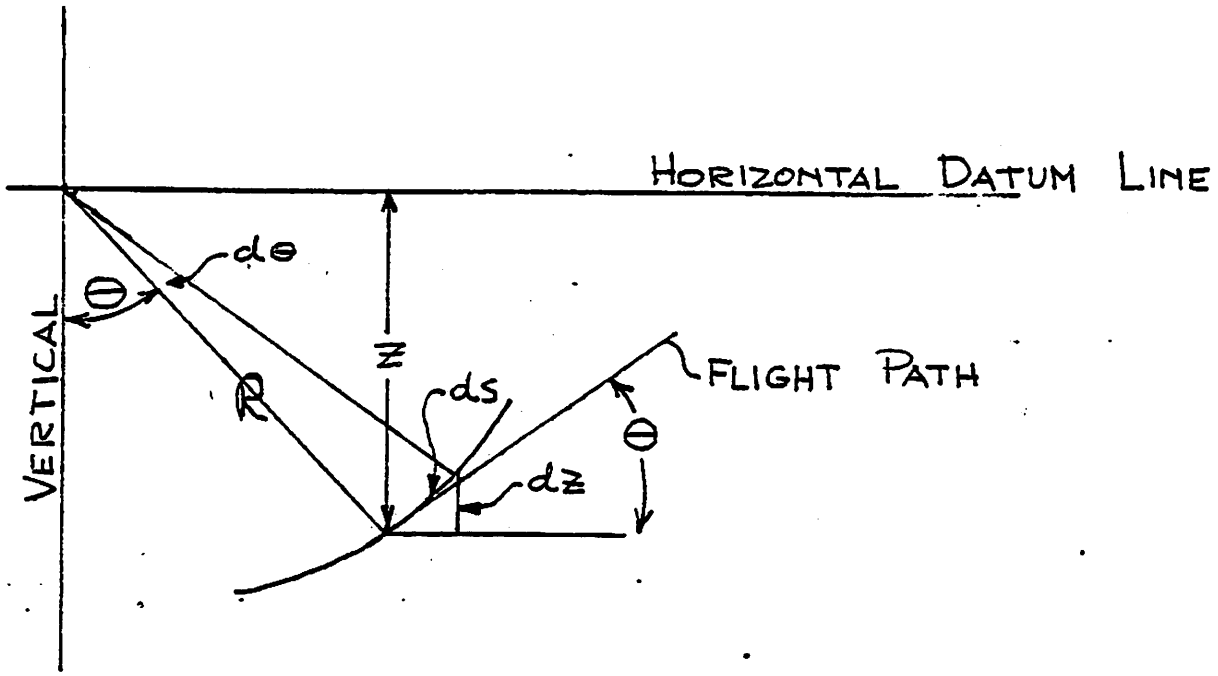
$$\frac{L}{L_1} = \frac{KV^2}{KV_1} = \frac{K2gZ}{K2gZ_1} = \frac{Z}{Z_1} \qquad (9)$$

then $$L = L_1\frac{Z}{Z_1} = mg\frac{Z}{Z_1} \qquad (10)$$

As flight in general will reflect some radius of curvature, let us consider the forces generated in flying along a curved path. If R is the radius of curvature of such a path (see following page for diagram), and θ is the inclination of the path with respect to the horizontal [R taken as (+) for an outside loop and (-) for an inside loop], then

$$ds = -R\,d\theta = \frac{dz}{\sin\theta} \qquad (11)$$

$$R = \frac{-dz}{\sin\theta\,d\theta} = \frac{dz}{d(\cos\theta)} \qquad (12)$$



The total force acting perpendicular to the flight path is the sum of the lift and the component of weight along R. If we call this force F_R

$$F_R = mg\frac{z}{z_1} - mg\cos\theta \qquad (13)$$

F_R must be balanced out by a centrifugal acceleration equal to $\frac{V^2}{R}$ (high school physics again). However from (6)

$$\frac{V^2}{R} = \frac{2gz}{R} \qquad (14)$$

By combining (14) with (12) we have for the centrifugal acceleration

$$\frac{V^2}{R} = \frac{2gz\,d(\cos\theta)}{dz} \qquad (15)$$

And the centrifugal force will be

$$\frac{2gz\,d(\cos\theta)\,m}{dz} \qquad (16)$$

Equating (16) and (13) and dividing through by mg, we have

$$\frac{2z\,d(\cos\theta)}{dz} = \frac{z}{z_1} - \cos\theta \qquad (17)$$

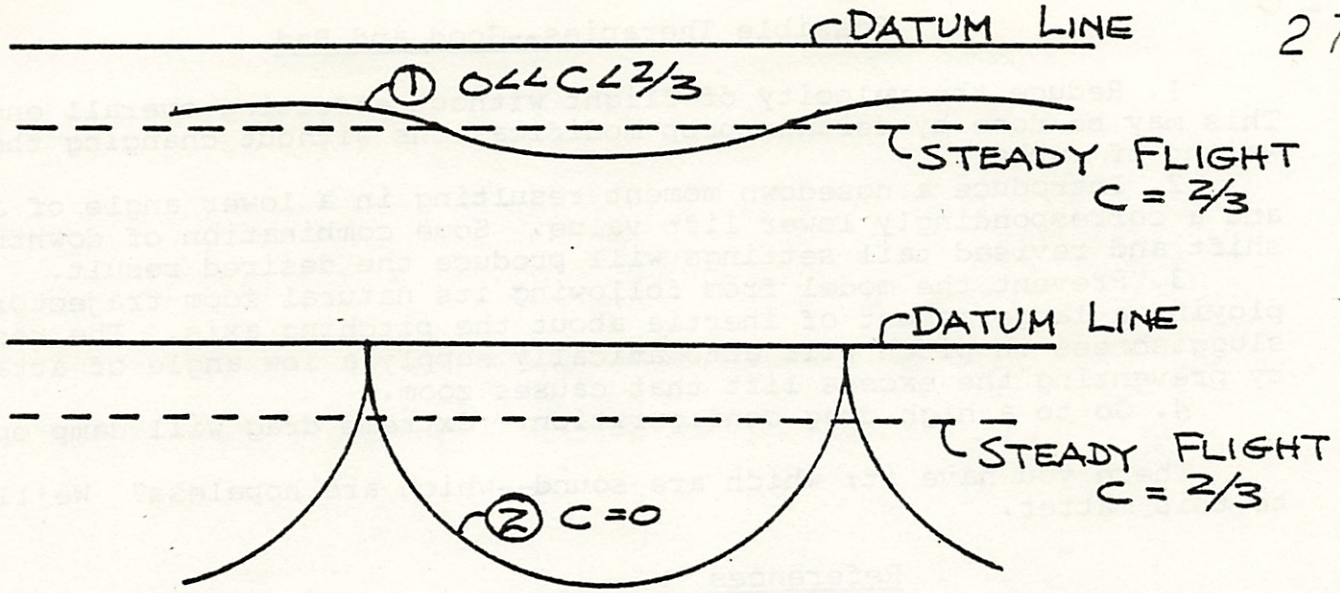
If we now multiply every term in (17) by $\frac{1}{2}z^{-\frac{1}{2}}$, we are in a position to integrate. The integral is

$$\cos\theta = \frac{1}{3}\frac{z}{z_1} + C\left(\frac{z_1}{z}\right)^{\frac{1}{2}} \qquad (18)$$

Where C is an arbitrary constant of integration
From (12) we have

$$\frac{1}{R} = \frac{d(\cos\theta)}{dz} = \frac{1}{3z_1} - \frac{1}{2}C\frac{z_1^{\frac{1}{2}}}{z^{\frac{3}{2}}} \qquad (19)$$

Together, equations (18) and (19) establish every possible flight path as a function of the parameter C. Of the two equations, (18) yields the slope along every flight path and (19) yields the radius of curvature. While an infinite number of flight paths are possible, because C is not constrained, in practice two flight paths are of particular interest. Termed phugoids by Lanchester, these two are given below.



In the case of ① the phugoid is one of gentle undulation about some steady flight path. For a perfect model ($C = 2/3$) we would generate an absolutely steady flight path. Yet the gentle undulations associated with $C < 2/3$ are acceptable and we are content. However when C goes to zero we are horrified, for we have entered the world of zoom and doom. The model remains the same highly stable model capable of yielding smooth and steady flights. What has happened?

At this point Lanchester bows out and we are left to pur own devices. Let us imagine that we are entering phugoid ② at bottom dead center. Here $\theta = 0°$ and $C = 0$. From (18) we have

$$1 = \frac{1}{3}\frac{z}{z_1} + 0$$

$$\text{ie } 3 = \frac{z}{z_1}$$

Inserting the above into (9) we have

$$\frac{L}{L_1} = \frac{z}{z_1} = 3$$

In other words, phugoid ② is caused by an excess amount of lift, equal to 3 times the required lift. From (7) we see that the excess lift results from an excess velocity, one equal to $\sqrt{3}$ times the necessary velocity. And so, we arrive at a statement of the problem: Zoom is due to excess lift in turn due to excess speed. An increase in speed equal to roughly 75% of cruising velocity beyond cruising velocity will automatically convert a nice, stable model into a zoom to doom monster.

The problem has nothing to do with high wing vs low wing, downthrust vs. upthrust, Jumbo vs. Peanuts, rubber vs. gas, indoor vs. outdoor, or even FAC vs. the Others. If you start with a satisfactory model adjusted for slow cruise, and manage to get it going too fast the zoom is automatic. The reason for the prevalence of zoom at mass launch events has to do with the competitive spirit aroused in otherwise reasonable men. Some desperate flyer, sensing impending elimination in the next round, will put more turns into his motor than warranted. The burst of energy is quickly converted into excess speed which then...

Yes, Lanchester has performed a noble service in laying out the zoom problem clearly, for all to see and ponder. But human nature contains a large portion of perversity and impatience. And there are those among us who are even now crying--I knew it all along--so what--to hell with the disease, where is the cure--you're in the pay of the Others--high school physics stinks gym was OK--etc, etc.

To these doubters and scoffers, the following challenge is offered. Listed below are four possible therapies for zoom. Some work, some do not. Examine these carefully and determine which are gold and which are dross. We shall return to the issue in our next meditation and announce the winners. Here is your chance to prove that insight and experience are worth more than calculations--

Possible Therapies--Good and Bad

1. Reduce the velocity of flight without effecting overall endurance. This may be done by certain prop modifications without changing the overall weight of rubber.

2. Introduce a nosedown moment resulting in a lower angle of attack and a correspondingly lower lift value. Some combination of downthrust, C.G. shift and revised tail settings will produce the desired result.

3. Prevent the model from following its natural zoom trajectory by employing a large moment of inertia about the pitching axis. The resulting sluggishness in pitch will automatically supply a low angle of attack, thereby preventing the excess lift that causes zoom.

4. Go to a high drag configuration. Extreme drag will damp out zoom.

There you have it; which are sound--which are hopeless? We'll return to this matter.

References

1. Circular Airflow--Frank Zaic--available through AMA and SIG for a few dollars. Must reading for anyone interested in stability--even if you do not completely agree with the author.

2. Flying and Improving Scale Model Airplanes--William F. McCombs--AirAge 1977--Available through MAN for about $8. And well worth it.

3. Aerodynamic Theory--Durand--Dover, 1963--Three volume hard covered--$17.50 back in '63: an encyclopedia, calculus prerequisite. LANCHESTER SPOKEN HERE.

4. Aerodynamics for Model Aircraft--Avrum Zier--Dodd, Mead (1942): long out of print--very good on indoor.

5. Model Airplane Design and Theory of Flight--Charles H. Grant--AirAge 1942, long out of print--stability material questionable, but good stuff on rubber, gears, old timers.

And Now, G.G. Answers Your Questions:

Q: When I tie knots in my motor, using spittle as a lube, the rubber tears. What's wrong?

A: Your spit lacks viscosity; its lubricating quality is deficient. Smoke heavily. Develop a hacking cough. Buy a spitoon and practice, practice

Q: I've built the Gordon Roberts P-51 from Crosswinds plans and while it will do a consistent 2 minutes, there is one thing--it flies backwards. My friends say I'm winding the prop in the wrong direction. What do you think?

A: Dear Mark, if it will do 2 minutes, enter it as an Ascender and tell your friends to mind their own business.

Q: My husband spends most of his time making those stupid toy airplanes. I'm thinking about a divorce. What do you say?

A: It depends. Peanut or Jumbo?

Q: I've built a super Jumbo with a two-holer trainer configuration. The cockpit opening is eliptical and I was stumped for a means of making a neat coaming edging until I learned that by dropping a watermelon on the fuselage from about 12 feet, real crisp openings resulted. However now that I'm flying the model I find that the motor keeps blowing. Why?

A: Dear Allan, remove the motor before you drop the watermelon. The bursting fruit releases flying seeds and pitts that nick the rubber.

Courtesy CIA INFORMER #4/83

GLUING REVISITED: I suppose most of you out there in the model building universe read L. F. Randolph's article, "Gluing" in March 1983 Model Aviation. I thought it was a very good article and helpful to most of us. It was apparent to me, however, that there is one new product Mr. Randolph must not have tried or his article would have been considerably longer to accommodate coverage of this "glue." To my way of thinking, it is the closest thing to a universal model building adhesive I have ever used.

I'm referring to "Franklin Home, Shop & Craft Glue," hereafter referred to as HSC Glue. If the name Franklin strikes a chord with you, it must be 'cause you, like myself, are a Titebond user, and it is another Franklin product. When you first see a container of HSC Glue, you'll probably think, another white glue! Whoa hoss! So far the only similarity that HSC Glue has to any other white glue I have ever used is the color white. As soon as you remove the cap and squeeze some out (it won't pour), you will see the difference. It's thick (no run, no drip), dries fast, fills gaps, dries clear, and seals wood surfaces. It also retains some flexibility when dry which gives considerable impact resistance.

Because Titebond is thinner, it penetrates wood better and thus for pure wood joint strength is superior. This is important on firewalls, l.g. mounting, etc., but for flexing structure, give me HSC Glue.

The new HSC Glue is extremely versatile and has some features which make it practically indispensable on your work bench.

Here are some of the uses that have been found for this new adhesive:

(1). Construction --
Use a complete construction glue (especially medium to heavy structures) pin/clamp, etc., just like when using model airplane cement; only you get it finished quicker and gas/oil mixes and hot fuels won't touch it.

(2). Faster Construction --
Make basic assembly with cyanoacrylate adhesive, then use HSC Glue as follows:

(a). Sand framework to finished state.

(b). Apply HSC Glue onto any area or joint that needs additional strength (I apply with toothpicks or hardwood dowel, but fingers work fine) or where gaps need filling. (ED NOTE: Hey, Bob, how about pouring some in an empty Hot Stuff bottle and using the tapered point dispensing cap?)

(c). Using your finger (or a damp rag if you're fussy) smooth HSC Glue into joint or gap. Typically, I use at wing dihedral joints, rib and spar joints, rib to LE/TE joints, fuselage structure joints, gaps in planking, any place additional strength is desired. Within reason you can actually form HSC Glue into contours. Always remove excess and smooth it out. Properly done, it dries clear and smooth with no need to sand it again.

(3). Sealing --
Unbelievable! Sealing inside wooden cowlings, nose blocks, wooden wheels, etc., has long been one of my most detested modeling chores. Endless coats of dope and it still most likely isn't sealed adequately. Try this with HSC:

Dilute with water about 50-50 (put water in container first so glue doesn't tend to stick to the sieds and bottom). Mix with a brush. Use a good one if you like--won't hurt it a bit. You just wash it out with water when you are finished. You want the mix about the consistency of a thin milk shake. Now brush on two coats (allow drying between) on any wood surface you want to seal. After it is dry you can apply the same finish you are using on the rest of the model.

(4). Covering --
More unbelievable!! No need to pre-dope structure before covering with paper or cloth. HSC Glue diluted with water works better than any adhesive I have ever used on covering materials with wet strength (silk, silkspan, ply-span and bamboo paper have been used to date, also old timer models, red porus paper, which is the same as once was called sky sail). On silk and heavy paper I use the same 50-50 mix as for sealing. For lighter materials I like it thinner--have used as thin as 30-70 successfully.

(a). Silk and silkspan: Cover wet or dry. Dry: Just brush on HSC mixture on outline of structure and smooth pre-cut sections of covering material onto structure. Pull wrinkles out of the open area but don't worry about small ones in contact areas as they pull out as adhesive dries. On planked areas you can apply adhesive on top of covering and work through with brush and fingers. Wet: Don't apply on outline of structure. Wet and position covering material. Apply HSC mixture through covering and rub onto the outline structure. Wet or dry, it's the only way to fly on under cambered wings. Stick the covering on and when adhesive dries, its there to stay. Water, dope, nothing will pull it loose (if you have it stuck down in the first place). An entire side of a planked fuselage with compound curves can be covered with one piece of covering material. Applying adhesive through covering and working from center to edges with brush and fingers, the HSC mixture allows heavy wet strength materials to flex as no other material I have ever used. Silk works best of materials tried, but expect other cloths would work the same.

(b). Wet strength tissues: (Light bamboo, ply-span, light silkspan, sky sail, etc.). Cover wet or dry. Either way, use the approach of brushing HSC mixture on outline of structure. Position covering material and smooth out edges.

(c). Jap tissue and other tissues not having wet strength: HSC will work but be careful--brush sparingly on outline of structure. Position tissue but don't apply much pressure as the lack of wet strength can cause tears in areas where HSC mixture is in contact with tissue. With Jap tissue it's still the best adhesive to hold covering on under cambered wings or other concave surfaces.

(5). Other things of note --

(a). Finishing. Mostly I use clear nitrate dope thinned with blush retarding thinner. If it's for glow engine A.C., I apply a coat of clear epoxy. On smaller models I have used Aero Gloss and Sig Lite Coat. I have also experimented with K&B epoxy, enamel, and polyurethane. All are compatible with HSC Glue and diluted mixture for covering.

(b). A hair dryer can be used to speed up production when using HSC Glue.

(c). Keep your brush in a container of water when not in use. When finished, wash with soap and water. When dry, you can use for clear dope or whatever!

(d). You foam freaks check this out. HSC Glue bonds foam, seals foam and doesn't attack foam. Beyond this, I haven't had time to experiment.

(e). A couple of experiments indicate that a thin mixture of HSC Glue and water may provide an excellent sizing for silk, reducing coats of dope to seal.

(f). When covering wet, if you have to reposition covering, re-wet contact areas.

(g). In case you haven't gotten the message, HSC Glue is impervious to any known fuel or finishing material I have found to subject it to.

CFFS FAC 2nd ANNUAL HYDRO AT LAKE BUTCHSAN 7/3/'83 in high wind and white caps on lake.

FAC PEANUT SCALE

PILOT	AIRCRAFT	FLYING TIME LOGGED	STATIC LOAD	TOTAL
1. Major Del Balunek	Mil. Waco SRE	52	60	112
2. Major Mike Zand	Dayton Wright Racer	45	61	106
3. Air M'l D. Norman	Art Chester Goon	50	56	106
Mike Zand back up	Bleriot Canard	27	75	102
4. Capt. Don Assel	Fike E	44	51	95
Del Balunek 2nd flt.	Finnish Me 109F	32	58	90
Major Dan Briehl	Wittman Tailwind	(18) Tailslide!	52	DNQ
Lt. Andy Medovitch	Boulton Paul Defiant	DNF Night Flight Duty		
Lt. Paul Dietz	Piper J3 Cub	DNF AMA cut orders for ground spotter		

FAC RUBBER SCALE, PLUS 5 R.O.W.

1. Major Del Balunek	Civil Waco SRE	55	65	120
2. 6* Dennis Norman	Race P-51 Boomer II	57	62	119
3. Major Mike Zand	Aeronca K on floats	37 + 5 R.O.W.	63	105
4. Major Dan Briehl	Ninitkin Schevschenko	39	61	100
5. Lt. Robert Zand	Heinkel He 100D	46	44	90
Lt. Andy Medovitch	Bell P-39 Cobra	Test cracked		
Air Marshall Norman	Me 109 E ½"/ft.	Needed Desert filter		

OLD TIMER KIT OR PLAN SCALE

1. Air M'l D. Norman	Bellanca Skyrocket	40 + 55 + 0	95
2. Major Mike Zand	Rearwin Sportster	22 + 34 + 25	81
3. Major Dan Briehl	Stinson 105	30 + Cracked	30
Lt. Andy Medovitch	Taylorcraft	Cracked	
Major Mike Zand	Withdrew due to doubt of prior to 1942 date on Aircraft log.		

NO. CAL. &/OR SCHNEIDER CUP PROFILE SCALE

1. 4* General Russ Brown	Occhipinti Tailwind	24 + 47 + 45	116
2. Major Dan Briehl	Pilatus Porter	34 + 29 + 38	101
3. Major Mike Zand	Hannan Nieuport Mono.	(18)+(16) Not for gale winds!	DNQ

JET CATAPULT SCALE GLIDER

1. Captain Don Assel	Bell X-5 Full Swept wing	30 + 31 + 39	21	121
2. Lt. Dick Woodward	SAAB J-35 Lansen	12 + 17 + 21	27	77
3. Lt. Andy Medovitch	NAA F-86 Sabre	18 + 17 + 20	20	75

R.O.W. EMERYO ENDURANCE

1. Major Dan Briehl	Debut on floats	60 + 14 + Sank +9	83
2. Lt. Mark Schneider	"Ocean Bird"	1 Dove in white caps!	1
All others tied down by Coast Guard Storm warnings!			

CO_2 OLD TIMER REPLICA PRECISION

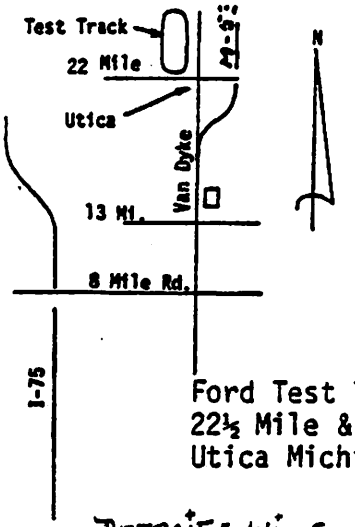
1. Major Mike Zand	MINI RULER	13 + 3 + 8	24
Major Dan Briehl	POWERHOUSE	No Power!	
Lt. Richard Woodward	DIAMOND DEMON	Demons at work!	

HAND LAUNCH GLIDER SR.-OPEN

		JR.	
1. Lt. Tad Jones	53 + 45 + 51 = 149	Lt. Taylor Strack	30 + 29 + 26 = 85
2. Lt. Dick Woodward	60 + 32 + 47 = 139	Lt. Jeff Briehl	5 + 6 + 6 = 17
3. Lt. Ken Strack	50 + 37 + 46 = 133	Lt. Robert Zand	Threw Sphere!

Lt. Andy Medovitch 74, Lt. James HArris 70.

FLYING ACES NATS IV



Ford Test Track
22½ Mile & Van Dyke
Utica Michigan

DETROITENVILLE

A.M.A. Sanctioned

Hosted by "Cloudbusters" & Detroiten Geschwader

Saturday July 14 Events 9 A.M. - 5 P.M.

*FAC Scale
FAC Power
FAC Peanut
*Embryo Endurance
WW II Combat - 10:00 A.M.
Golden Age - 1:00 P.M. - Between Wars, Fixed Gear, Over 13", Under Jumbo.
Thompson Trophy - 4:00 P.M. - Radial Engine Racers, Racing Colors 24" Max.

Sunday July 15 Events 10 A.M. - 5 P.M.

*No-Cal
Jumbo
*Full Factor Peanut
Greve Trophy - 11:00 A.M. - Inline Engine Racers, Racing Colors 24" Max.
WW1 Dog Fight - 1:00 P.M. Multi Wing Over 13"
WW1 Peanut Dog Fight - 4:00 P.M. Multi Wing

Awards - To Third Place All Events
*Denotes Special Hi-Point Jr. Award

Entry Fee - All Events Sr-Open $10.00 Advance (by 6-15-84)
12.00 on Site
Jr. $ 4.00

Nats Hq. The Midway Motor Lodge
31800 Van Dyke (just North of 13 Mile Rd.)
Warren Mich 48093 PH. 313 393-2860
$55/Room w/ Two Double Beds - Mention Flying Aces

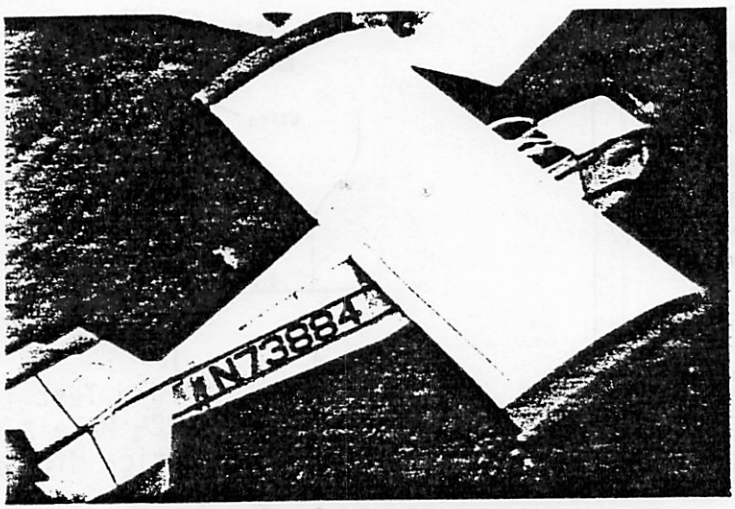
Friday Evening July 13 Hospitality Room at the Lodge

Saturday Evening July 14 F.A.C. Nats Banquet at the Lodge
$12.00 per person prepaid by 6-15-83
F.A.C. Awards, Kanone Review,
Commander Words of Wisdom,
Presentation/Discussion of Certain Nats Models,
Earl Stahl Perpetual Trophy,
Guest Speaker

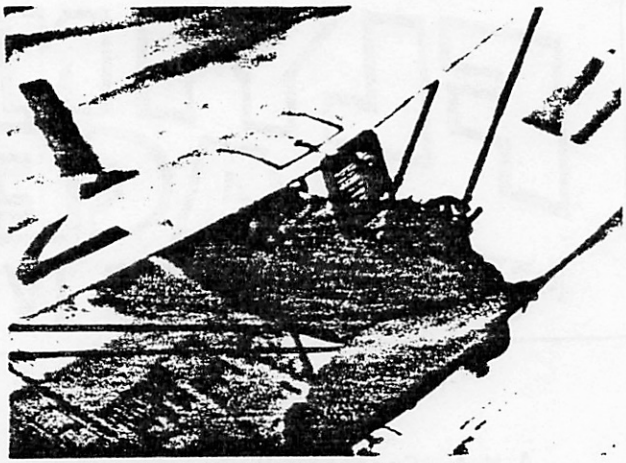
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SUNNYBROOK MOTEL
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27 Championship Holes • 58 Brunswick Lanes
Food at it's Best . . A Snack or a Banquet
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Between Mound & Van Dyke
STERLING HEIGHTS, MICH. 48078
Category I
Indoor Site ?

Contest Director
Ralph D. Kuenz
14645 Stahelin
Detroiten Mich
48223
S.A.S.E. for Rules

Advance Entry &
Banquet Reservations
F.A.C. Nats IV
P.O. Box 129
Birmingham, Mich 48019



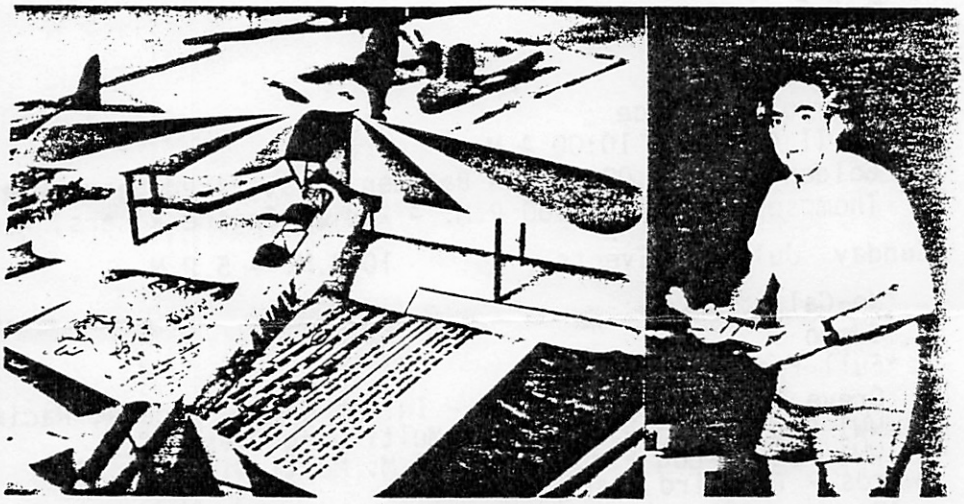
AARON MARKOS FROM CHICAGO DID WELL WITH THIS RED AND WHITE LACEY. FINE WORK BY A JUNIOR.



HIGHLY DETAILED MODEL A FORD ENGINE ON ED TOLEIKIS' PIETENPOL.



MARTIN FLYING A MARTIN. DOC PUTS IN JUST A "TWEEK" OF WARP IN THE WING.OF HIS PROFILE.



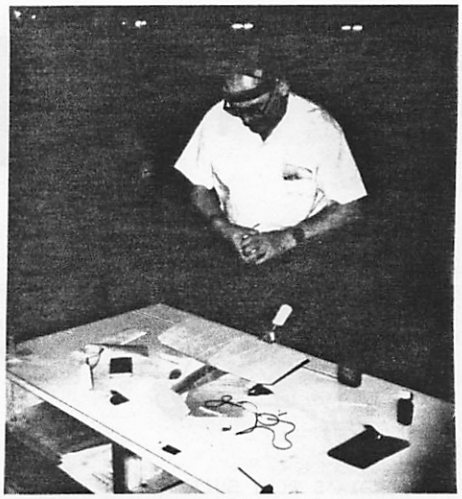
CHUCK MARKOS AIRBRUSHED THIS TIGER MOTH IN YELLOW, RED AND BLACK. FLEW AS GOOD AS IT LOOKED. CHUCK TRIED MANY DIFFERANT PROP/MOTOR COMBINATIONS.



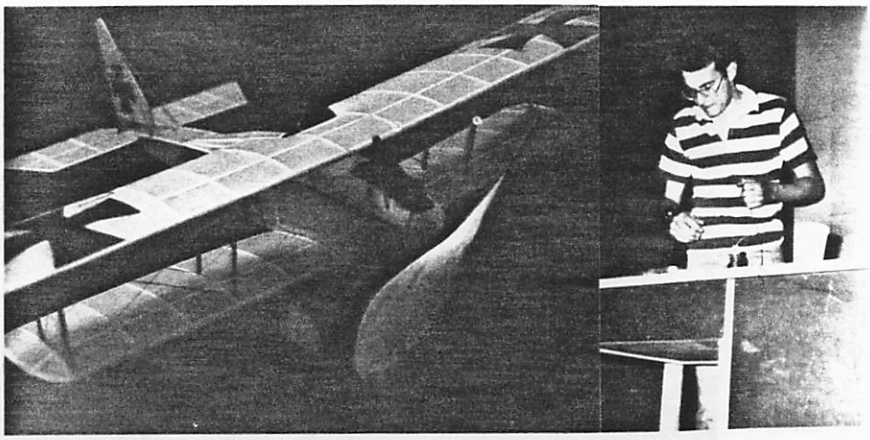
JACK McGILLVERY WON THE TWIN ENGINE EVENT AGAIN THIS YEAR WITH HIS YUGO-SLAVIAN TYPE 45T. GOOD PICTURE IN JANE'S 1955-56.



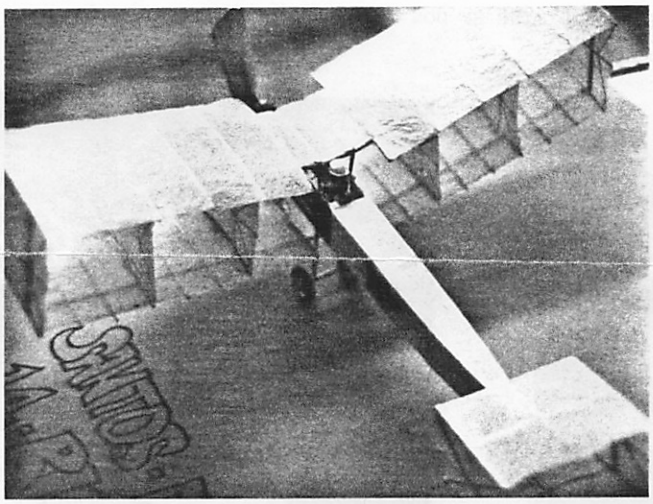
BRENT SAULSBURY OF PENYTON TEXAS SENT A PROXIE 1910 NIEPORT. IN TRANSIT THE PACKING BOX GOT REDUCED TO ABOUT ½"THICKNESS. CHRIS AND FRANK SCOTT REBUILT AND PATCHED THE PLANE BACK TO ITS ORIGINAL HIGH LEVEL OF WORKMANSHIP. THEN THEY FLEW IT TO SOME VERY RESPECTABLE TIMES. WELL DONE CHRIS AND FRANK.



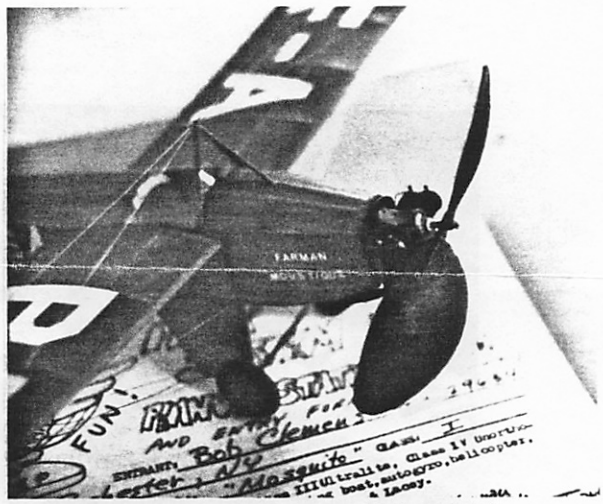
TORONTO'S LOU LEIFER KEPT BUSY IMPROVING HIS PROFILE FIKE.



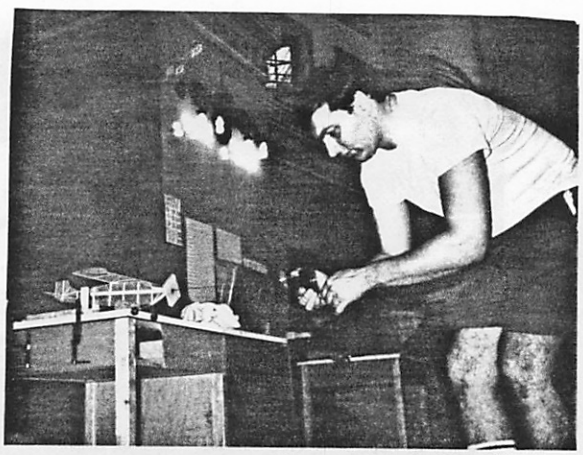
WWI HALBERSTADT D BY ROSS JAHUKE FROM WISCONSON. BEATIFUL WORK BY AN UPCOMING YOUNG BUILDER.



SANTOS-DUMONT PISTACHIO SIZE BY DOC MARTIN. PILOT KNEW WHAT HE WAS DOING; PLANE FLEW NICELY.



THE ENGINE ON BOB CLEMENS' FARMAN LOOKS REAL ENOUGH TO FIRE UP AND FLY AWAY.



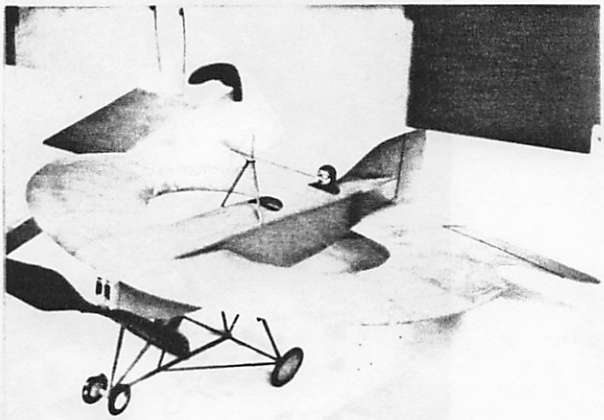
CLEVELANDER LARRY LOCKA PACKS TURNS IN HIS PROFILE FIKE. OFFICAL FLIGHT 4:17.



CONTEST DIRECTOR DOC MARTIN DID MANAGE TO GET A FEW FLIGHTS IN. BOB ANDREWS HOLDING.

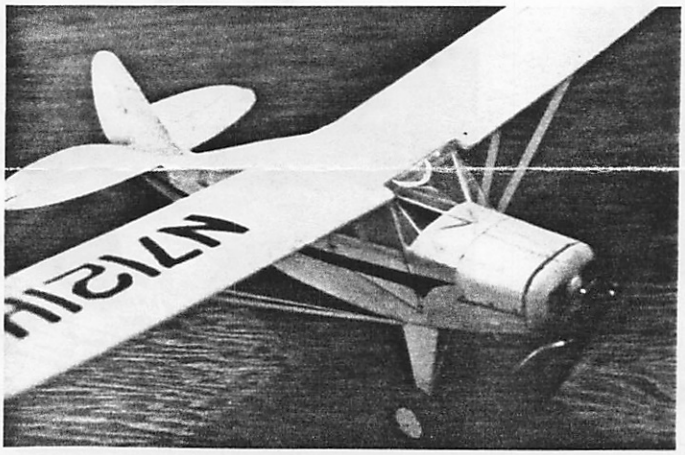


BOB CLEMENS DID HIS USUAL OUTSTANDING JOB ON THIS CURRIE "WOT". 3-VIEWS IN AEROMODELLER, MARCH 1965.



FLORDIA'S TONY SUTTER FLEW THIS LEE-RICHARDS ANNULAR-WING. IT DID 40 SECONDS R.O.G.

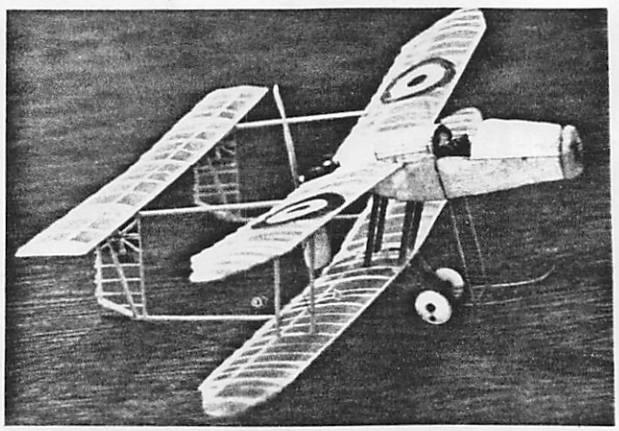
PHOTOS AND EDITING BY DON "WIZ" ASSEL



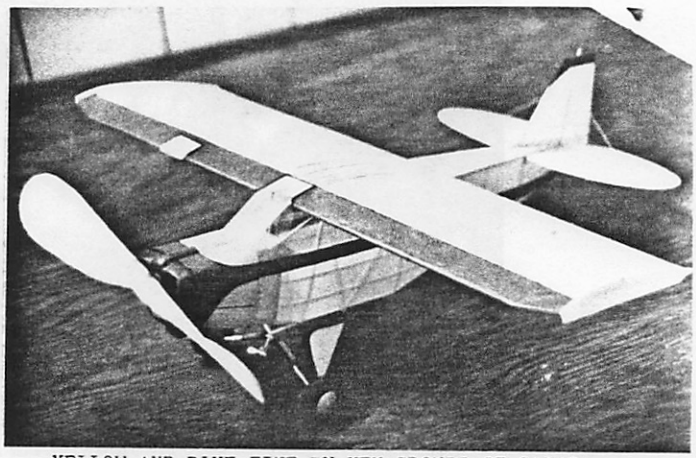
ALL PIPER VAGABONDS SEEM TO FLY WELL. THIS YELLOW BEAUTY IS BY MIKE ARAK. GOOD DETAIL.



BUTCH HADLAND FROM ENGLAND AND BOB ANDREWS OF FLORDIA JUDGED 90 SOME MODELS. THANKS FELLOWS. ITS PEOPLE LIKE THIS THAT MAKE A CONTEST RUN SMOOTHLY FOR THE REST OF US.



EXPERIMENTAL WWI BLACKBURN A. D. SCOUT BY MILLARD WELLS. FLEW WELL--LANDED LIKE THE REAL ONE--UPSIDEDOWN.



YELLOW AND BLUE FIKE BY KEN GROVES OF CANADA. VERY LIGHT AND VERY GOOD CRAFTSMANSHIP. IT TOOK FIRST PLACE WITH FLIGHTS OF WELL OVER TWO MINUTES.