CROSSWINDS

QUARTERLY

ISSUE 71

CROSSWINDS
4909 N. Sedgewick
Lyndhurst, OH 44124

FLAT HATIN' ON :
ROSCOE TURNER
DIME SCALE
UP A NORSKI
BORON FILAMENT
AND LATE NEWS.

Your address number is a renewal issue No. for $10 CROSSWINDS contributions to Russ Brown 4909 N. Sedgewick, Lyndhurst OH 44124 USA Thanks for lift!

As the last load of CROSSWINDS 69 was in the Pony Express sack, Bill Lamm from the TRW Met'l Eng. Lab. came past my desk. The Biederman aviation art calendar was flipped over to a nifty Beech 17 staggerwing with bold contrast marking (artistic license). Every two months the calendar stops Bill in his tracks to re set memory cells. Bill flashed back to his model building youth, when he could get kits for only 10 cents, and proudly revealed he had reached the rank of CAPTAIN in the Roscoe Turner Club. Roscoe pitched for Heinz 57 brands in the late 1930's. Like FLYING ACES MAGAZINE, for 5 box tops sent in with your name and rank, you earned a promotion. Bill ate and collected enough cereal tops to reach CAPTAIN. He still looks a bit bloated from the task. At the last five box tops, Bill found out that Roscoe's crew didn't keep a tidy log. All you had to do was name a rank, and they promoted you to the next one! Bad Guy Squadron was at work even then. Say it wasn't so Roscoe! Ah, but that is the way it was, and the zest to collect cereal box tops was gone. Bill also gave up building 10 cent kits as the prices went up, WW II came along, and even Roscoe got passed over for promotion.

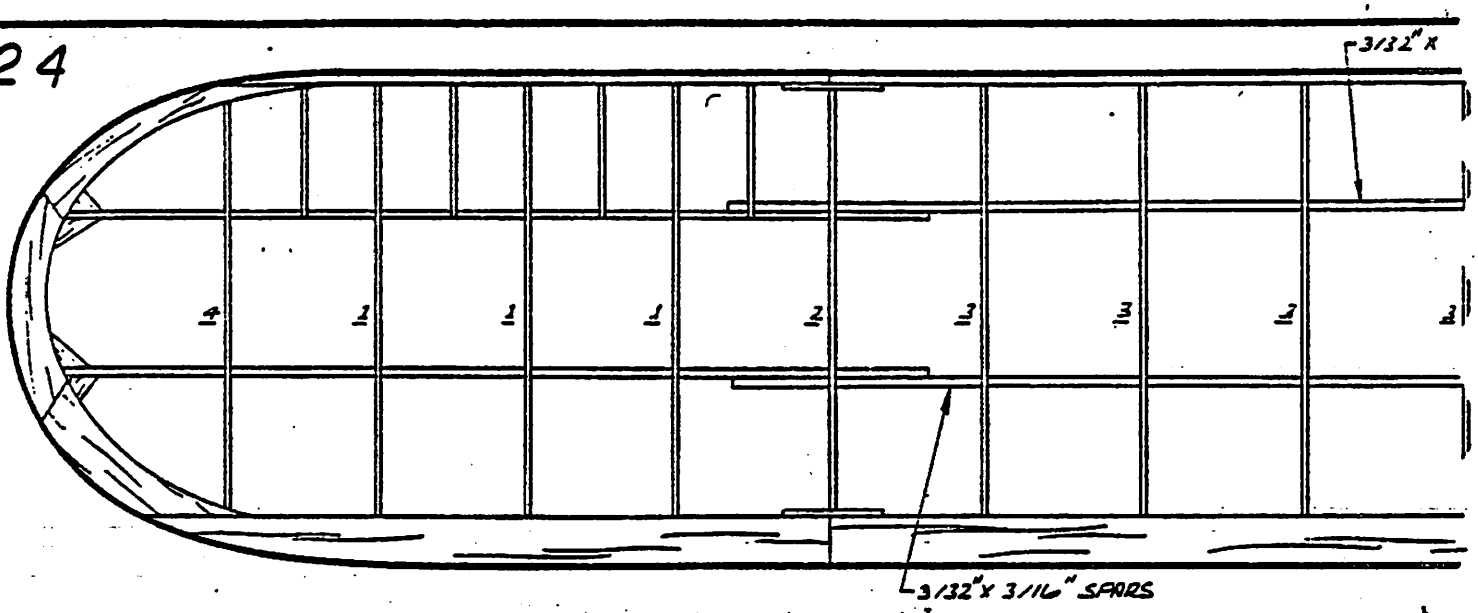
Nearly 45 years later, the Flying Aces Club promotes fliers at 5 Kanone (Ist place wins) increments. GHQ keeps a close count of FAC event wins, and the local CD has to send in those ever lovin' Kanones. No paper promotions in the FAC! Mike Zand, Lead Editor this Issue, just reached 16 Kanones to be awarded the Blue Max medal from GHQ. In a moment of reckless zeal, exhilaration, or compassion, Mike offered to do the entire edditing of this issue, so this Editor might get back to building something. Thank you Mike, and GHQ too for the inspiration. But much as I need to build something, there is news too good to hold up !till next issue.

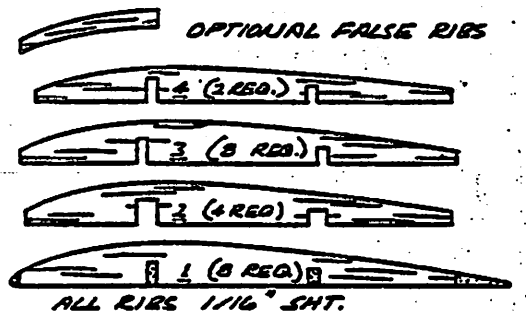
10¢

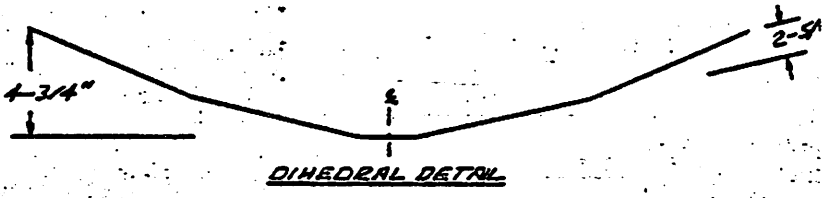
Dime Scale is back! Not for that thin dime of course, but the $1.50 per plan and $1.50 for print wood is light enough for those 12 to 20 inch wingspan Comet, Dallaire, Megow, Peerless, and Scientific Kits that sold for a dime once. Jack Fike is off to a good start with several choice models ready from Scale Flight Model Co. at 630 Fairway Lane in Bloomington, IN 47401. Jack flies rubber scale (verry well), and suggests Dime Scale as an FAC event using bonus points and per plan replica points. Sounds like more good fun.

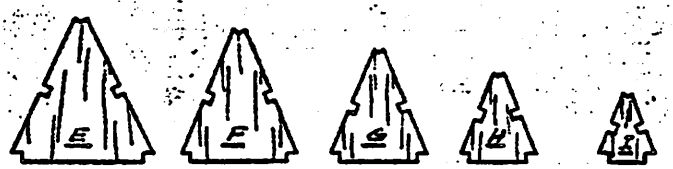
Flying Aces Club was founded around these little dime wonders, and a little refresher will be good to keep our helmits on straight 'Nes Paw? These Kits can also be flown in the Old Timer Rubber Scale events without bonus points . CFFS and ERIE Hellcat Squadron fly many such events. Jack Fike also has plans and wood for several larger duration O.T. rubber drive models including the Scientific 30" Whippet, 25" Bantom, and 25" Raven. These larger planes are attractive for the Commercial event, or for the CO_2 power replica events. The larger sizes force up prices a wee bit. Send Jack a SASE for the list and pick out a favorite. G-8 saw the list at the CFFS meeting and sent over a 16" Comet R.O.G. Phantom kit to add to the set. Thanks Jim. Let's all see what we have to fill in the gaps. One Kit Jack can use is the Comet Wiley Post Model A; that will be a nice addition for CROSSWINDERS. Blue Fox Base archives show 16" Burd, 12" Dallaire and 12" Duncan Gold Seal Kits at 10 cents in '30s. Bet there are more. Joe Ott had some swell kits, and the real big ones were only 25 cents. Only 25 cents? that was a whole lot of money then. Contest entry fees were 25 cents also.

Jack says he is not lost, and Bloomington is in Indiana. Wish he was in Illinois. 'cause the only flying Wiley Post A as of August 1960 EAA SPORT AVIATION was there. Marion McClure is or was the owner of Serial No. 10 Wiley Post A from 1935. We need colors. HELP!

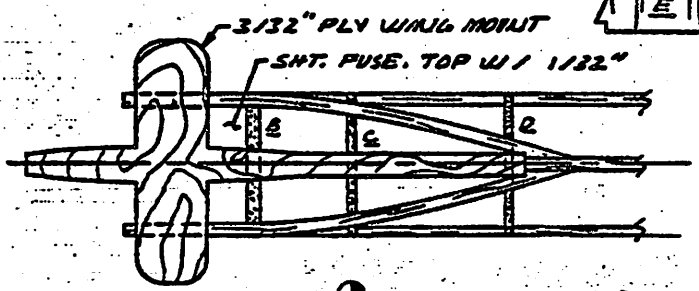

3/32" K
4
1
1
1
2
3
3
2
3
3/32" X 3/16" SPARS

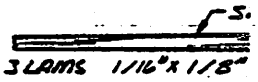

OPTIONAL FALSE RIBS
4 (2 REQ.)
3 (8 REQ.)
2 (4 REQ)
1 (8 REQ)
ALL RIBS 1/16" SHT.

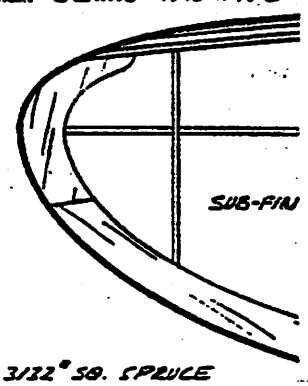

4-3/4"
1/2-9
DIHEDRAL DETAIL

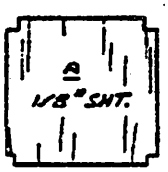

E
E
G
H
I
FORMERS C-I ARE 1/16" SHT.

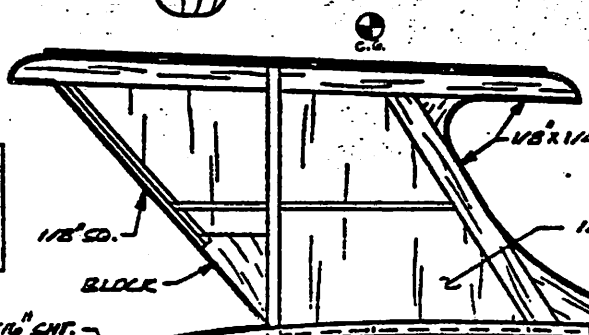

4
1
FIREWALL
1/16" PLY.

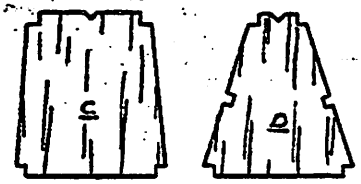

3/32" PLY WING MOUNT
SHT. PUSE. TOP W/ 1/32"
A
B
C
D

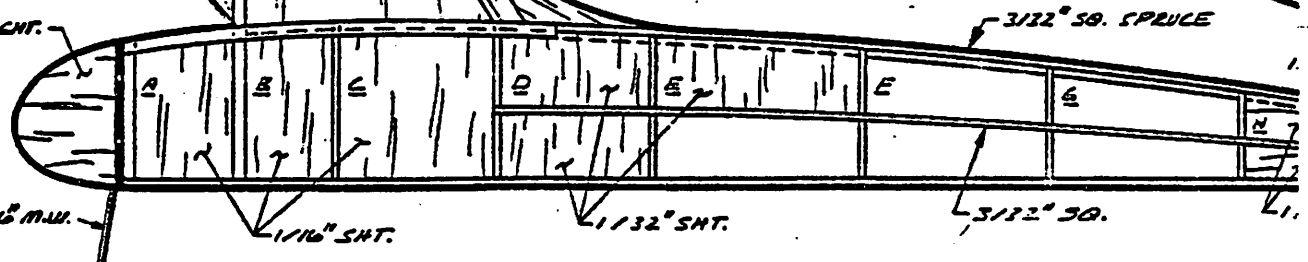

S.
L.E. 3 LAMS 1/16" X 1/8"

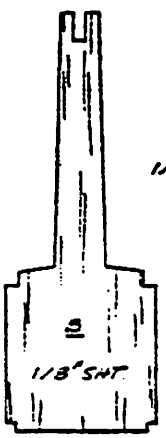

SUB-FIN

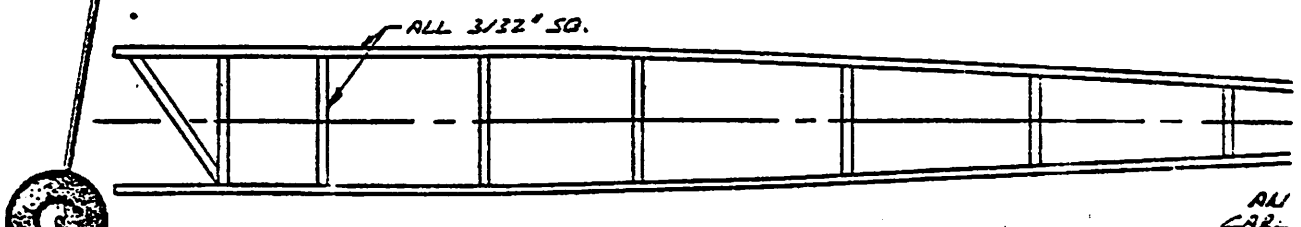

A
1/8" SHT.


C.G.
1/8"x1/4"
1/8" SQ.
BLOCK
1/32" SHT. PYLON SIDES L & R
*NOTE: LEFT SIDE NOT SHOWN IN THIS VIEW


C
D


1/16" SHT.
3/32" SQ. SPRUCE
A
B
C
D
E
E
G
1/16" M.W.
1/16" SHT.
1/32" SHT.
3/32" SQ.


G
1/8" SHT.


ALL 3/32" SQ.

1" DIA. WHEEL

ALL CAR.

INT

FOX FUZZ
4909 N. SEDGEWICK
LYNDHURST, OH 44124

FLAT HATIN' ON BORON FILAMENT

PLEASE DON'T EAT THE BORON

Better than balsa? Can it be true? A definate maybe! And just when the cryogenic (cold) super tankers find wet balsa is not such a great insulator. How strange to be loading up with high price Boron Filament just when the price of balsa starts back down! But in pursuit of performance, price is not the game.

Boron is an element that lives up in the light and lively high country out North West in the Periodic Element Chart (top left). I think Boron was discoverd by Ronnie Reagan on a 20-Mule-Team tour of force in Death Valley, while looking for property in Silicon Valley. Boron does behave like Silicon, but is light like Carbon. IT MUST BE TOXIC AS ALL 20 MULES WENT TO GLUE.

Boron Filaments are vapor plated pure Boron on either fine Tungsten or Carbon core from a Boron Trichloride vapor and Hydrogen gas. Sounds expensive 'Nes Paw? You Bet. When the now surplus 1960's composite programs supply is gone, It may not be available commercially. There may be some work on Boron as fine powder forms, by the year 2002. Present technology seems to be trying S Glass in multi strand tow strips as a nearly as stiff alternate to Boron. S Glass has slightly more ducility than Boron and may have promise for less cost. The very fine size requires grouping as tow strips, like carbon or graphite fibers. duPont Kevlar 149 for use in composites is good in tension, but not so good in bending or in compression. Besides, it eats cutting tools. Cracking in fast set epoxy binders contributes to failure problems.

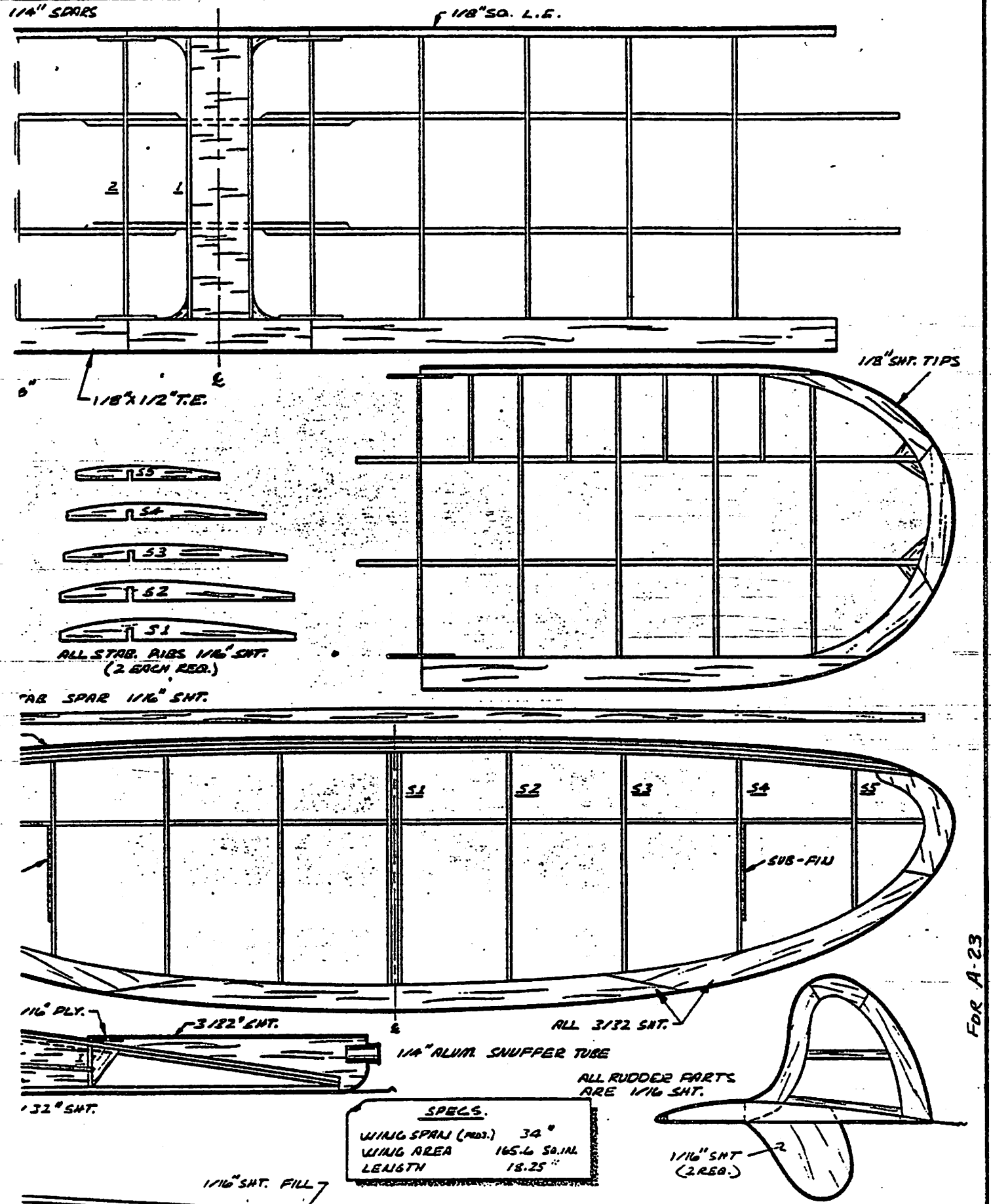
Nothing is as good as Boron Filament for stiffness and strength per weight. Data shows Boron:

Almost twice as stiff as steel at Y = 58 X 10^6 PSI.
9X stiffness of aluminum.
38X stiffness of spruce.
100X stiffness of 8lb/ft^3 balsa.
6X stiffness per weight of balsa. But glue and tissue "rib Stiching" add weight.

The weight of a .004 inch diameter filament is .0000173 oz/inch, or .00049 gm/inch . This is equal to the weight of a 1/64th sq. strip of 8lb. balsa, and the tension strenght of 1/16" sq. balsa. At 450,000 psi X .0000126 sq. in. area, over 5 lbs. load in tension. Most impressive. But like ultra high strength materials, the ductility is low. Boron filament wants to be straight like it was formed, but it can be bent to nearly an inch in diameter. Restrict the bend to a close space and it snaps right off. If bent to break by finger tips, some will get into the finger. Don't eat it; Boron is TOXIC. The little fragments drill in like glass.

Reinforced Balsa may be a good place to substitute Boron in for less balsa. One half to one quarter total original balsa plus 2 filaments per original 1/16 square balsa may be a good place to start experimenting. A real good bond to the balsa is vital. Jack McGillivray, who may be do ing the most to develop light FF Scale structures, finds that if the Boron comes off the balsa structure (delaminates) , a local bow out over bend breaks the filament and causes a stress concetrated total fracture. Bonding the filament to balsa can be as a Boron sandwich or on one side with a tissue " rib stich" lap. Franklin HSC thick white glue may be a good ductile adhesive. If Boron is laminated to the inside of an edge or outline, try covering the lower surface of a wing first and bring the tissue over to lap on the inside edge over the Boron. Experience will lead us to how much is best without using more than is necessary. Not too much in place of graphite tow on foam hlg wings for example. Boron also works well as rigging wire or external brace wire. Use Boron Filament to punch in holes and a toothpick dab of glue on the end will hold it in. The bumpy over plated micro surface on the filament is enough of a toe hold to glue.

SAMS the Indoor supply in England and source for Curt Stevens MRL Boron Filament overseas advises that the main use on larger rubber models is for wing spars. SAMS mentions Indoor motor sticks, outlines, ribs, wing posts, bridge braces, prop outlines, frames and angle braces. It should be helpful on those fuselage stick models that bend on full winds. The Swiss models at World Champs at Romania put Boron at 4 O'Clock & 8 O'Clock locations with a single bracing wire over the top of the stick.



FOR A-23

SPECS.	
WING SPAN (PROJ.)	34"
WING AREA	165.6 SQ.IN.
LENGTH	18.25"

OLD REPLICA OF
GOLDBERGS 1942

ERCEPTER

DESIGNED & DRAWN BY:
JERRY MURPHY

TRACED FOR M.B. BY:
S.A. PAERSON

0 1 2 3 4 5 6 inches

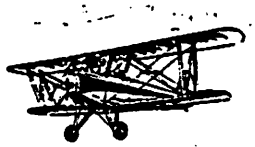
MODEL BUILDER magazine
621 W. NINETEENTH ST.
COSTA MESA, CALIF. 92627
Plan No: 1177-AT.

FLAT HATIN' ON : DIME SCALE CONT'D.

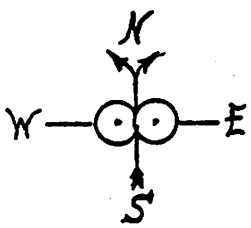
The Marion McClure Wiley Post Model A on the Aug. 1960 EAA SPORT AVIATION is a light over all color with a color trim edged by a contrast line. George A. Hardie Jr. who edits the mystery plane feature in EAA VINTAGE AIRPLANE may be able to help out here with data to follow. George may find more on the Mercury Monsoon B-100 Cabin Biplane for a future plan. We still need colors on this clean negative stagger bipe with retracts to go ahead. EAA has the follow up design Mercury BT-120 Aerobat at Oshkosh, WI. Look for more in V.A. Join EAA ($25) and the Antique Classic Div ($18/ Yr.) to see a lot of inspiring aircraft. EAA is at Wittman Airfield Oshkosh, WI 54903-2591 U.S.A.

Gordon Codding responded to the Wiley Post CROSSWINDS project with a prompt package of model plans from his extensive collection. Gordon sent both the 22 " 'span plan from July 1936 Model Aircraft Builder by J. Zeboyan (FS-140 at .75) and the 18" Comet/American Model Modelcraft Co. plan (FS-133 at $.60). This Dime Kit Plan shows as No. A8 on Comet list from Jack Fike, with same NC 13915 numbers. Comet suggests yellow wings and tail assembly with a green fuselage. Best stick with the Hurst Bowers all over yellow with black trim for contest use, or stay loose and wait for the attractive Marion McClure markings. Order the Model Museum plans of Gordon Codding at 3724 JOHN L. AVE. KINGMAN AZ 86401. Do yourself a favor and put in $3 for his plan lists. Add 60 cents for Wiley Post FS-133.

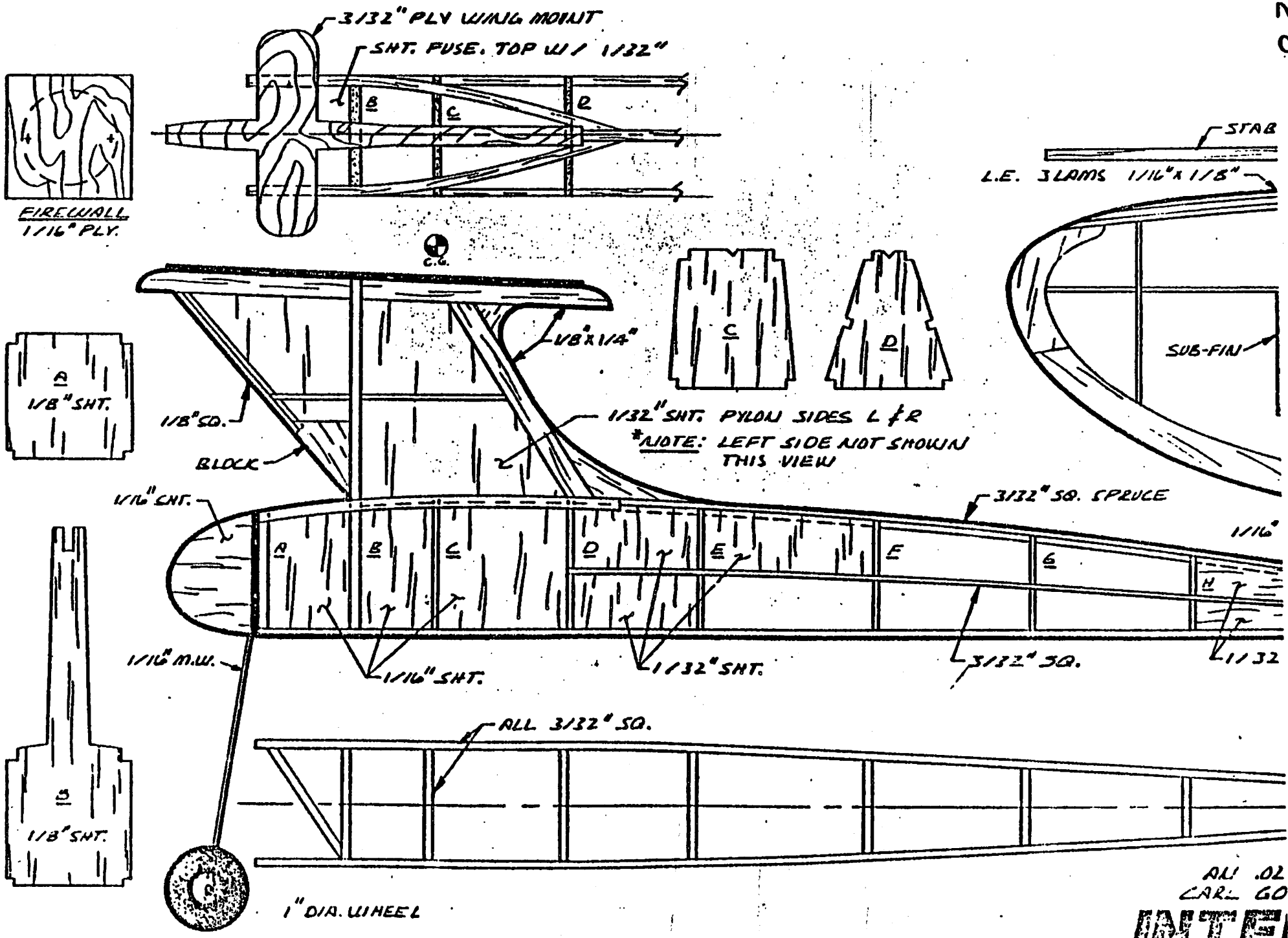
We also appreciate that CROSSWINDS cover artist Ron Henderson took time while moving(to near Euclid Beach)to look through his Cleveland Plans for Wiley Post Plan CD159. Sorry but Ron didn't have this one. CD159 may be a blue print of the later additions to the Cleveland Models line. Ron provides the art for the next Spitfire Issue. Look for Ron's offer to do aviation art in this issue pg. . He also builds some terrific looking models on contract. Alb DV was a beauty. I'll bet Ron would have fun flying a CO_2 power Wiley Post A !



UP A NORTHSKI



OPE'NOR'SKIVER? WHEREINTHEHELL is it? Which way is up? 'Gimme a map. Never mind: Lets just follow the trails blazed on strips of rubber trees by the Indoor fliers all going North to Circle Pines. OP'NORSKIVER is not a place but a special tool. It is THE tool for precise cuts off Contest rubber strip. The OpeNorskiver is the throughly developed state of the art of rubber stripper by Bob Oppegard at 140 E.Golden Lake Ln. Circle Pines,MN 55014 . Bob is a talented and well equiped model flier just elected president of the Minneapolis Model Aero Club. He is also into Indoor, and found as an interested beginner that a rubber stripper is a must. But Indoor competition has a strange affect on the social behavior of its many expert enthusiasts. Show and tell of rubber strippers was not to be had. (Perhaps they were embarrassed by results). Bob was forced into a lengthy development program. The latest design is as precise as the cutter can set a .001 inch micrometer slide given a uniform strip of rubber. The resulting Ope'sNorskiver is the rage among aware Indoor fliers, and the word is spreading fast. Bob is also dedicated to keeping the price down, so while this dual disc cutter might go for say $125, Bob has it cost priced at under $70 for the present. The latest model arrived with a cutter disc tension adjustment wheel added to the crank and a .003 inch taper to the(brass) rubber strip guide. Bob may need to adjust the price for the added wheel version, so write in to beg a place on his next run , and get the current price. Spare disc blades may be a good investment at $5 for the imported Polish blades (the SKI part of of the name with Nor for Norway led to a catchy Ope'Norskiver identity;it did not come from Northrop and Uberskiver). Bob recommends cutting strip wet to reduce friction. Spray the cutter with L.P.S. #1 after use to prevent rust on the wet steel parts."Go wash your rubber"Bob sez in response to the Blue fox base sign off "Go break a gum band". We tried it out and it really does an accurate job. O.K. we dealt some Boron to work into a place on the Oppegard production list and we got our precious instrument from Uppa U.S.; Now tell us amis, WHEREINTHEHELL IS PIRELLI?


3/32" PLY WING MOUNT
SHT. FUSE. TOP W/ 1/32"
B
C
D
FIREWALL
1/16" PLY.
C.G.
STAB
L.E. SLAMS 1/16" x 1/8"
SUB-FIN
C
D
A
1/8" SHT.
1/8" SQ.
BLOCK
1/8 x 1/4"
1/32" SHT. PYLON SIDES L & R
*NOTE: LEFT SIDE NOT SHOWN THIS VIEW
1/16" SHT.
3/32" SQ. SPRUCE
1/16"
A
B
C
D
E
F
G
H
I
J
1/16" M.W.
1/16" SHT.
1/32" SHT.
3/32" SQ.
1/32
ALL 3/32" SQ.
B
1/8" SHT.
1" DIA. WHEEL
ALL .02
CARL GO
INTE

FOX FUZZ
4909 N. SEDGEWICK
LYNDHURST, OH 44124

FLAT HATIN' ON BORON FILAMENT

MORE ON BORON by Ed Whitten in May, 1984 MODEL AVIATION pg. 112 reviews the what, where, and how much of Boron Filament. Boron on Carbon core filament is about the same as Boron on the .0004" diameter Tungsten wire core. Actual tensile test data on spool filaments may vary closer to 450,000 psi tensile strength than the ideal 550,000 psi level quoted. We don't really care to design to breaking load if it works, and we can get some. It does work, and we can get it!

Blue Fox Base has loaded up on both Boron Filament on Tungsten and Borsic or Boron on Carbon in the .004 inch diameter size. Curt Stevens offers 1000 ft. spools for $25. in U.S.A. SAMS, 2 THE DRIVE, BLACKMORE END, WHEATHAMPSTEAD, HERTS U.K. has this for U.K., Europe +10%, and Non Europe sales plus 15% on 100 ft. L6.99, 500ft. at L12.50, 1000 ft. spool at L 19.75 and 2000 ft. L 32.95 plus the 5% in U.K.

Jim Jones at 36631 Ledgestone, Mt. Clemens, MI 48043 has 250 ft. spools of Boron Filament for $15. Send .50 or stamps for Jim's list of handy , dandy tools. His ABS Balsa Stripper is real good. Lots more: Tissue, Torque Meters, Prop Blanks or forms, blades, etc. , etc. We hope to see Jim at the FAC NAT'S July 14 & 15 in Detroitenville. You too; Be there!

FOX FUZZ above can supply Boron Filament at the established prices of $25 per 1000 Ft., $45 for 2000 ft., and $60 for 3000 ft. spools. At 2.5 cents per foot, this is actually a lot less than handy bundles of 1/16 sq. balsa strips! As an experimenters alternate to the Ray Harlan offer of 2 ft. straight lengths of 200 ft. for $8, FOX FUZZ offers 50 pc. bags of Boron in 3 ft. lengths at $6.00 at local C.F.F.S. contests. Add .50 if you can't attend, and want to take a chance on the mail. Out of U.S.A. add 20%.

> The FAC NAT'S SPECIAL for orders to FOX FUZZ by July 4, 1984 and picked up at the FOX HOLE at the Sunnybrook Motel on E. 17 Mile Road July 13 & 14 (Russ Brown's room) or at the FAC Site, is $1 off. The Experimenters pack of 50 pcs. X 3 ft. will be $5 only at Detroitenville to orders in by July 4. See you there!

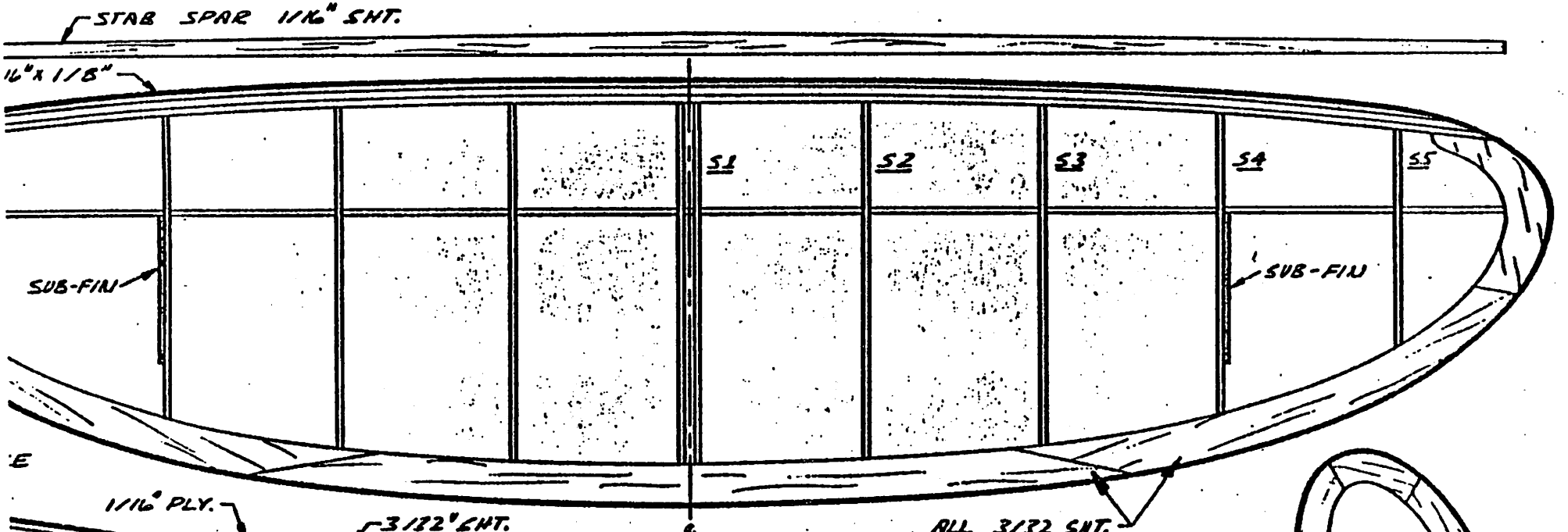
PLANS

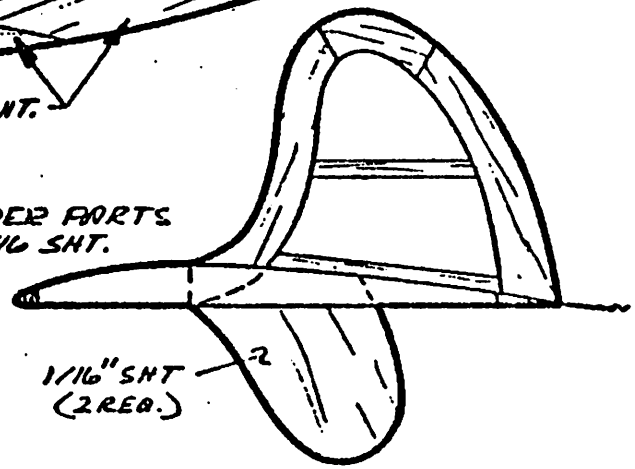
DAVE DIELS at P.O. BOX 101 WOODVILLE. OHIO 43469 adds 1/24 scale Boeing F4B (P-12C) plan 43 for $3 plus .75 and the Curtiss BF2C-1 Hawk III (F11C-3) Navy Fighter with retracting gear plan 42 for $3.25 plus .75. or 15% on order. This 15 15/32" span Hawk looks real good for CO_2 power use with the Brown MJ 70 or Campus Bee. Profile Publication 116 had photos and a color profile of the green tail USS Ranger Squadron 5 BF2C-1 Hawks. But don't look at this Profile , nor the Navy Air Colors Vol. 1 Squadron / Signal book if you don't want to get hooked by U. S. Navy Fighters. Love those Biplanes and WW II. Pre WW II U. S. Navy colors are so bright, and just the thing for flying over green. Dave offers enlarging or reductions and requests response to the future design survey.

Out West at 7611 Cypress Humble, TX 77338, Iron Mike Midkiff is drawing WW II Pacific Aircraft at 3/4 inch/ft. scale. General Mikes' Curtiss P-40 makes into many types, including the longer N model. P-40's were at their best in Africa, where the ammo trays were big enough to haul beer cans in! The Douglass SBD, and Vought Vindicator are also 3/4" scale. The Curtiss SB2C Helldiver is 5/8" Scale, and the Beautiful Radial Engine Laird Super Solution Biplane is 1" scale. Del Balunek flew his Laird at Erie, and it flies nice. Lets look in Mikes' P-40 at the FAC Nats and see if the beer cans are Stroh brand. Plans are $5.
Judy & Jill Plans are ready also!

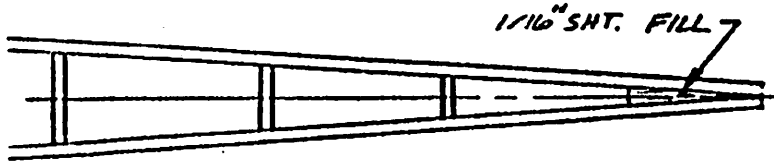
1-2-1 Model Plan Co. 2200 W. Cornwallis Drive, Apt. 308 Greensboro, NC 27408 also has a selection of 1" per foot scale plans by Stephen A. Lambert for $5.00 each. These are:

1) Fok. D-VIII, 2) Gull-E O.T. Rubber elliptical Gull wing non scale, 3) deH Puss Moth, 4) 1/2 scale 42" Turner Special O.T. from May '36 MAN, 5) 24" Dormoy "Bath Tub", 6) Great Lakes T2-1A, 7) 19 3/4" wing Old Ironsides Cabin homebuilt, 8) Baby Ace 25½", 9) Volksplane 24", Wittman Buttercup 28", 11) 30" Les Long Longster 12) Pietenpol.





SPECS.	
WING SPAN (APPX.)	34"
WING AREA	165.6 SQ.IN.
LENGTH	18.25"



AN OLD REPLICA OF CARL GOLDBERGS 1942

INTERCEPTER

DESIGNED & DRAWN BY: JERRY MURPHY

TRACED FOR M.B. BY: S.A. PAERSON



MODEL BUILDER magazine
621 W. NINETEENTH ST.
COSTA MESA, CALIF. 92627
Plan No. 1177-AT.

ALL CFFS MEETS INCLUDE FLYING ACES SCALE, PEANUT SCALE, EMBRYO ENDURANCE (JS)(O), AND HAND LAUNCH GLIDER (J)(SO). CO_2 POWER AND *DESIGNATED EVENTS FLY FOR CO_2 MOTORS. ZED/ BROWN JR. MOTOR PRIZES LIMITED TO ONE PER FLIER IN '84. CFFS HAS CO_2 FOR BROWN FILLER.

June 10 Great Lakes Meet at Prangmore Field Rt. 832 McKean Pa. FAC Scale, GHQ Peanut, Embryo, No. Cal, Jumbo Scale, WW II Combat, HLG, .020 O. T. Replica, O. T. Scale, O. T. Commercial Rubber. CD: Joe Barna 1428 West 32 St. Erie PA 16508. 864-6933

June 17-21 Indoor Champs and MIAMA GRAND PRIX at MICHIGAN STATE FAIR COLISEUM, Detroiten.
6/18: HLG 8:30AM,AMASTICK 11:30, SPEED & ORNITHOPTER 5:30PM. TEST 6/17 12 to 6PM.
6/19: PENNYPLANE - NOVICE PP-BOSTONIAN- MANHATTEN, 1:00 CABIN- FID. SCALE IN 9AM.
6/20: EZB - PAPER STICK, PEANUT-AMA SCALE - KIT-PLAN, EZB 8:30-1:30, SC 1:30-6:30.
6/21: MIAMA INTERNATIONAL PEANUT GRAN PRIX 8:30-5:00 PM. Schedule Revised/ R. Doig.

June 24 CFFS CALM AIR MEET 1:00-9:00 PM at Lorain County Community College, Elyria, Ohio. FAC Rubber Scale, Peanut GHQ *(* CO_2 Motor Prize Event), CO_2 FAC Power Scale*(*3 Pl) O. T. Rubber Scale, WW I Biplane FAC Mass Launch Dogfight, Jet Catapult Glider Sc. Embryo Endurance (JS)(O), HLG (J)(SO). CD: G-8 and Battle Aces (Jim Hyka).

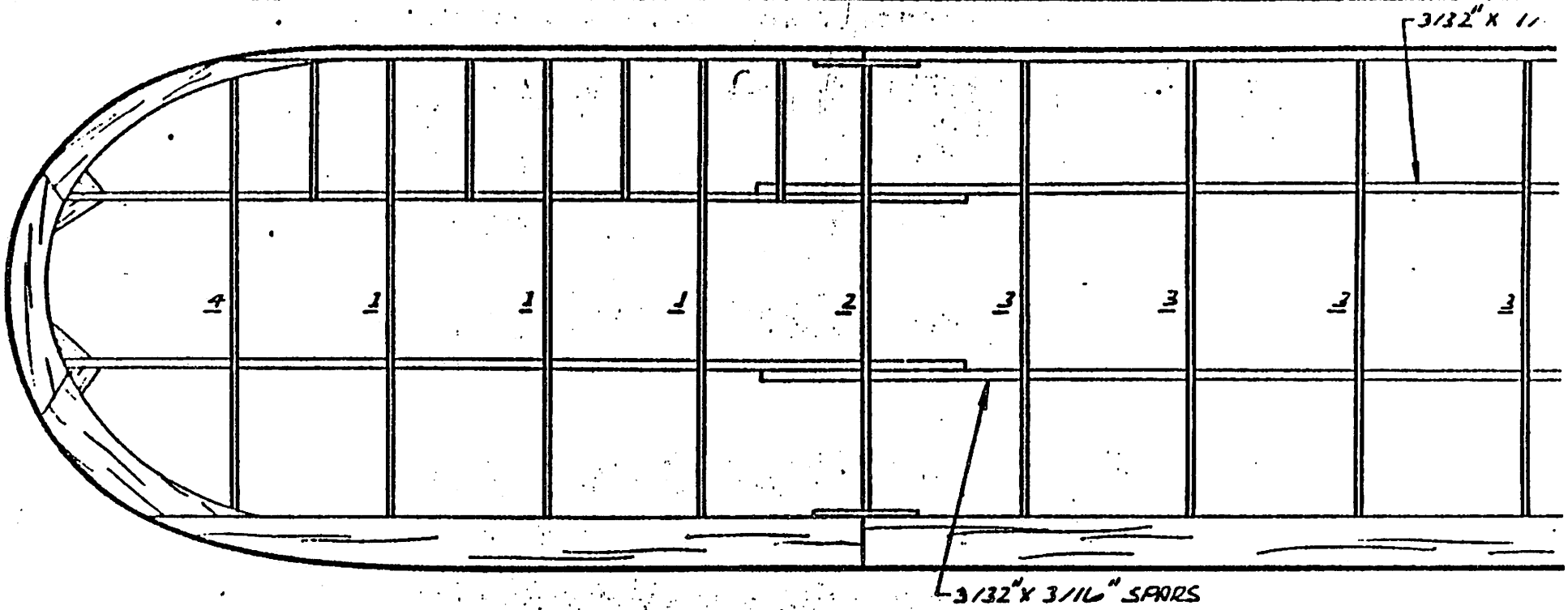
June 25-29 SAM O. T. Champs at Bong, WI. 14 Miles West of Kenosha off Highway 43. 14 "regular" FF Events plus 9 Specialty Events including Nostalgia Gas .02-.08, Nos. .081-.65, Twin Pusher, Jimmy Allen, and Commercial Rubber. For Commercial, bring proof of pre 1943 design or kit. 36" max projected wingspan, fixed 2 wheel landing gear per plan, balsa two-blade free wheeling type prop design for era may be increased to 16" diameter max. may be laminated sheet, warped sheet, or cut to shape. Model construction should generally follow the original and (full) geodetic may not be substituted. Wood sizes may be increased and some body planking is allowed. Extra spars may be added, but not to front one third (top) of wing. Balsa may be substituted for bamboo outlines. Check with Bob Larsh on rules at 45 S. Whitcomb, Indianapolis, IN 46241. Blue Fox Base adds the following: Response to the question Can I lighten the structure of Old Timer Models? is: YES. The SAM Rules generally allow lightening of structure, but retain the shape including airfoils. Original wood size is best for static judged events. No need to train those balsa termites now; use thinner stock, and bore out lightening holes just like big golden age airplanes. Replica Events do not require scale structure. No restriction to color and marking on wing front. (But the guy who finishes 2nd and maybe the CD will not think a whole lot of balsa triangles up top is real pretty) A few stripes are normal trim./ RB.

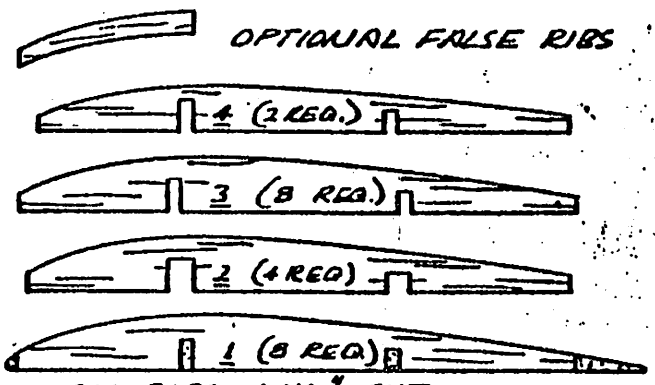
July 1 CFFS FAC and Hydro FF at LCCC Calm Water Meet 1:00-9:00 PM, Lake Butchsan Square Hole. FAC Peanut plus 10 R.O.W., FAC Rub. Scale plus 10 ROW, No. Cal, Old Timer Rubber Scale plus 10 ROW*, CO_2 Replica Precision*, WW I Peanut Biplane Dogfight, WW II Peanut Combat, Jet Catapult Scale Glider, Embryo Endurance (JS)(O) plus 10 ROW, HLG (J)(SO)

July 14-15 FLYING ACES NATIONALS MK IV at Detroitenville, MI (Ford Oval at Utica, MI).
Sat: WW II Combat at 10 AM, Flying Aces Rub. Sc., FAC Peanut, Embryo Endurance, Golden Age Rub. Scale for fixed landing gear types of 1920's and 1930's Mass launch at 1:00 PM. Thompson Trophy Race for 1929 thru 1939 Era Raced or Race Type Radial Engine types in appropriate marking for mass launch at 4:00 PM., and Flying Aces Power Scale. Banquet at Midway Motor Lodge Sat. PM. $12 by 6/15.

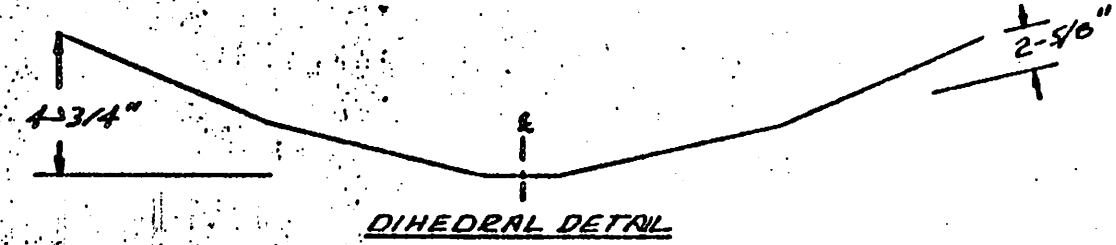
Sun: Greve Race for Inline Racers as above for mass launch at 11:00 AM, FAC Jumbo Scale, GHQ Peanut Scale, WW I Dogfight at 1:00 PM, No. Cal Profile, WW I Peanut Biplane Dogfight at 3:00 PM. Entry $10 Advance by 6/15 or $12 on field.
Advance Entry & Banquet: FAC Nat's IV P.O. Box 129, Birmingham, Mi 48019
CD: Ralph D. Kuenz 14645 Stahelin Detroiten Mich 48223.For rules send S.A.S.E.

July 16-20 CANADA NAT'S at Dunnville, Ont. North of Dunkirk, N.Y. & Lake Erie.
Mon: Entry & Practice. Tues: Coupe. Class 1 Power. Wed: Class 2 Power, HLG, and Scale (FAC). Thurs: Class 3 Power, Open Glider, Open Rubber.
Fri: F1A, F1B, F1C. Flying starts o900 each day 'till 1700. FAI 7 flights.

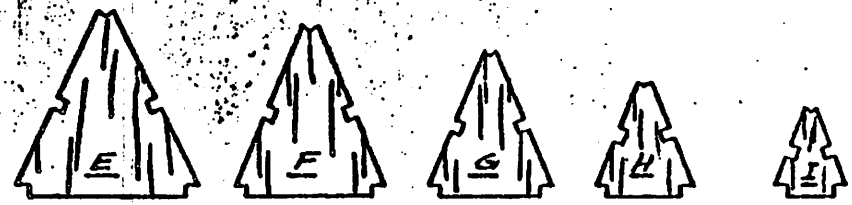




ALL RIBS 1/16" SHT.



DIHEDRAL DETAIL



FORMERS C-I ARE 1/16" SHT.

1984 CONTEST CALENDAR

July 22 CFFS FAC FF at LCCC 10AM-5PM Elyria, Ohio. Rain date for May 20. G. Roberts CD. FAC Peanut Scale* (*Designated event for A23/Soda), FAC Rubber Scale, No. Cal., Old Timer Rubber Scale, CO_2 Old Timer Replica Precision*, WW I Peanut Biplane, WW II Peanut Combat, WW II FAC Combat, Embryo Endurance (JS)(O), HLG (J)(SO).

Pike N.Y. Meet date and Old Timer R/C at Plum Brook Tentative date.

July 29 CIA at WPAFB Rain date for June 10.
OT A, B, C&D, HLG.. Rub., Nost ½A, ABC, .020 Rep/Nos(Comb), Sm. Rub. (from O.T. Commercial Kits). Richard Covalt CD. 2716 Catalina Drive Anderson, IN 46012.

7/29-8/4 EAA Fly In Convention at Oshkosh, WI.

Aug. 4 Sat. SAM 48 Niagara at Bedell Road, Grand Island, NY (just above Brewster Falls). FAC Rubber Scale, Cabin Rubber, .020 Replica O.T., (AB), (C). Rubber Cabin must use O.T. Prop shown on plan; if not shown, 1/3 of wingspan max. Proof required. O.T. R/C ½Texaco H.L., Antique(IGN & Glo), (Elect), (A*B IGN & GLO) C IGN & GLO). CD AL MACK 4572 Miller Road Niagara Falls N.Y. 14304 9am - 5pm. SAM 1984 rules.

Aug. 5-12 AMA INDOOR and AMA NAT'S at Reno, Nevada.

Aug. 12 CFFS FAC FF at LCCC 10AM - 5PM.
FAC Peanut Scale, FAC Scale, O.T. Rubber Scale, CO_2 O. T. Replica Precision*, Cleveland Post War Handicap Racers for best flight plus handicap plus 5 fixed gear type and biplane. Greve Race, Thompson Race, WWI Peanut Dogfight, Embryo Endurance (JS)(O) *, HLG (J)(SO). Russ Brown CD. 4909 N. Sedgewick, Lynd.OH 44124

Aug. 19 Erie MMA Picnic Meet at Prangmore Field. McKean Pa. Rt. 832 N. Rt. on 1st road. FAC Peanut , FAC Scale, FAC Power Scale, O.T. Scale, Embryo Endurance, WW I Dogfight, Thompson/ Greve Races, HLG, .020 O.T. Replica, O.T. Commercial Rubber. Vic Didelot CD, 4410 Lorna Lane, Erie PA 16506. PH 814 838- 3263.
Tentative date for R/C O.T. Meet at Richmond & Harvard Rd. Cleveland Rt. 175.

Aug. 25-26 WPAFB date. Practice 8/25, COFFC FF Meet 8/26.
½A, (AB), (CD), Coupe, HLG, .020 O.T. Rep, Nost, ABC O.T.. R. Lyle CD.
Potential FAC Dayton Buzzard Action. and/ or Detroit FFS Meets.

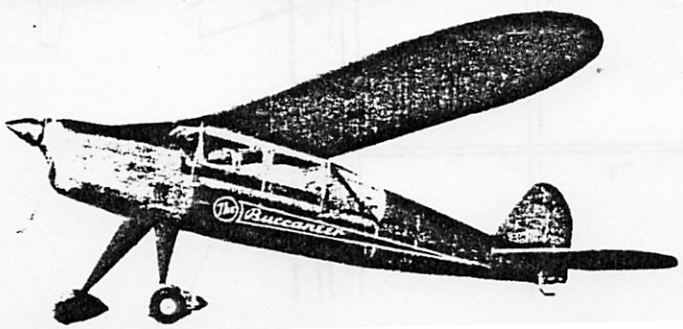
Sept. 9 Probable date for Canton FAC FF Meet.

Sept. 15-16 WPAFB date. COFFC Meet.9/16.
½A, A, B, (CD), Electric/P-30, Coupe, A1 &2, HLG, Nost., O.T. ABC. Harry Murphy.

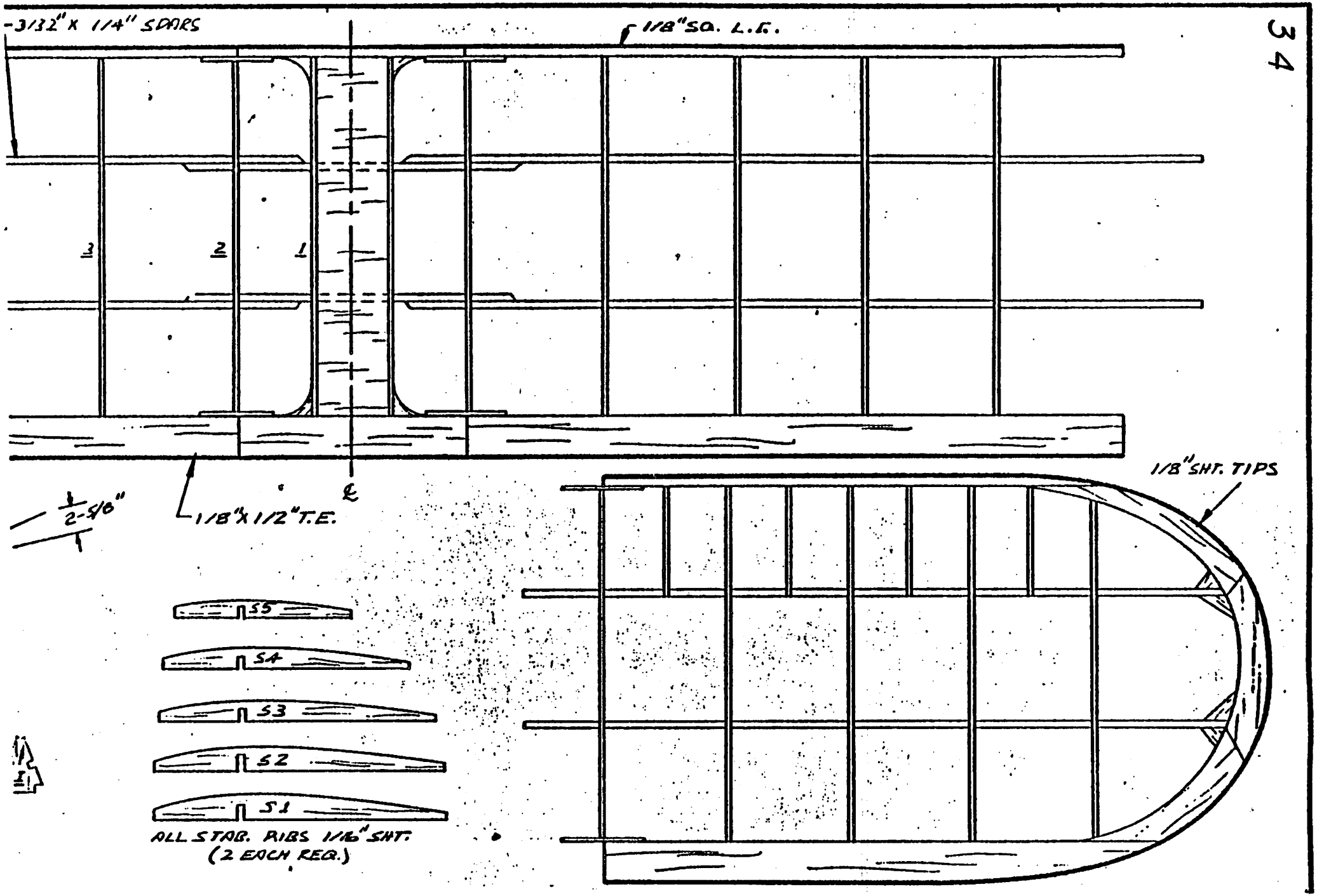
Sept 16 CFFS Fall FAC at LCCC 10AM- 5PM.
GHQ Peanut Scale, FAC Rubber Scale*,FAC Power Scale CO_2 or Elect.*, No. Cal. Profile, Cleveland Post War Handicap, Greve Inline Race, Thompson Radial Race, WW I Biplane, WW II FAC Combat, Embryo Endurance (JS)(O), HLG (J)(SO). Dave Pishnery 216-943-2640. 1st prize in FAC Rubber Scale is a Brown A23 & Soda Charger from A. H. ZED AIRCRAFT.

Sept 23 Erie FAC Fall GHQ Meet at Prangmore Field, McKean, PA.
FAC Rub. Scale, FAC Peanut Scale, Jumbo Scale, FAC Power Scale, O.T. Rubber Scale, WW II Combat, Embryo Endurance, HLG, O.T Rubber, .020 O.T. Replica. Lin Reichel CD.

Oct. 6-7 WPAFB date.



30"


-3/32" X 1/4" SPARS
1/8" SQ. L.E.
3
2
1
℄
1/8" X 1/2" T.E.
1/8" SHT. TIPS
S5
S4
S3
S2
S1
ALL STAB. RIBS 1/16" SHT.
(2 EACH REQ.)

***** With The Others In Paris *****
Mumbo Jumbo #10 from the Glue Guru, aka Leon Bennett

Salutations, disciples! It is spring again, a time when one's building efforts quicken, for soon will be heard again the ping of exploding motors and the scream of runaway freewheel mechanisms.

Engaged in busy preparations, I sensed a disturbing presence in my cave. Looking up, I was surprised to see Dave Crease at his most dapper, threading his way through the usual piles of contest grade balsa wood strewn everywhere. Dave himself! Not an emissary, not Bob Thumbsome, but Dave! Something really important must be up!

With a look of faint disgust, Dave levelled off a few piles of sheet stock and sat down. "Nice little -umm- cave you've got here." Several rodents, spying an intruder, stared at Dave with great interest but Dave was unable to reciprocate. "I'll come right to the point so that I can leave you -umm- to your work. There's a mission for you. It's an easy one; and it's in Paris. All expenses paid. You might call the operation a paid vacation. All you have to do is to fly a Jumbo contest. And we're not even ordering you to win."

Sensing a trap, for Headquarters is not noted for munificent awards to the foot soldiers, I countered with "Surely there are many flyers who would be interested. Why me?"

Dave rattled off an obviously rehearsed answer, something to do with Eastern religious beliefs producing an equanimity that more readily accepts those blows to the ego resultant from losing a contest.

My face registered disbelief. Dave sighed. "Here's the whole story. The French rubber scale people have long flown their own competitions. They call the event "sixty-six". The name comes from the maximum allowable wing span in centimeters, about 26 inches. Same dull stuff, year after year. But since the election of their new Premier, the French have been turning their culture upside down in the name of progress. Computers are being handed to the public - free. Trains are in operation that reach 160 MPH on a routine basis. And - Jumbo is coming to France!"

At this point Dave's face lit up with false animation. Something was amiss. "But you are not a Jumbo flyer" I said gently. "Nor are you a Francophile. Why are you concerned?"

"Because with this ferment, there's an opportunity! The French have scheduled a special Jumbo challenge contest to the entire world. The winner shall determine the basic mode of Jumbo -the rules -the outlook -the style -for generations to come! With one victory -FAC will take over French modeling. And then, all Europe! No longer shall we be but a minor thorn to the Others -instead we shall be the dominant force in most of the world-".

I now understood the enthusiasm and support of headquarters. Such madness is indeed the rationale for the existance of the leadership of any organization.

"Yes. But what is my precise role in this affair?"

"Umm. Yes. Well, you see, we of course received our official invitation and turned it over to -umm- Don Skoal. Umm- oddly enough we also got hold of -umm -found -anyone who says we paid for it is lying in his teeth -umm- the invitation to the Others -and so -umm-"...

"I am to represent the Others?"

"Well, yes. Of course, we want you to give it your best shot, but after all you're on a paid vacation in Paris and we don't want you to overwork yourself. You of course understand." Wink, wink.

"Yes. And have other groups entered?"

"No and that's the beauty of it all. When word got out that Skoal was flying for us, all the other contenders dropped out. We can't lose! You're in this thing merely to make it look like a contest - and to embarass the Others. Now the temporary rules will be a hodgepodge of international regulations. But don't worry about it; you'll pick it up. And once we win - the rules will be ours! All ours! Now, GG, about your -umm- model. Are you familiar with Grillo Kits?"

I blanched. "You mean the ones that contain genuine ossified wood -guaranteed not to burn or float? I believe their add says "Put the paper on and you have a model airplane, leave it off and you have a barbecue grill?""

"Yes, that's Grillo. They have a very nice Jumbo B-17 kit. One that would be exactly right for this event" - Dave stood up and dusted himself off while musing "Contests always contain some element of mischance. Even this one." He looked me straight in the eye and barked out "No matter what - do not try to win! Those are your orders - straight from the top!" and he was gone.

There is something to be said for building a model that cannot fly. The tension involved in complex trade-offs between performance and appearance are gone. One proceeds calmly to make a statue. Half forgotten skills, such as planking and electroplating, are revived. And indeed the finished B-17 was a striking model, right down to the miniature lead bombs that filled the bomb bays.

In the ROG attitude at full power, the four tiny props provided some faint urge to the wheels; a tendency to lean forward expectantly was detectable, but motion was not.

It remained but to place the model in a brand new wheelbarrow, generously supplied by headquarters, along with my spare dhoti and a few jars of Pakora. A farewell wave to the Glue Guruess and I began to trudge down the long road leading to Paris.

Countless miles rolled by under the wheelbarrow before my dust encrusted eyes at last sighted the Hotel Voltaire on the Left Bank -the site of the processing check-in and the scale cage. Bob Thumbsome, nervously pacing back and forth at the entrance welcomed me and pointed out my quarters under the adjacent Pont Neuf, a particularly sturdy and rain-proof bridge. A feature of the grassy location was easy access to the Seine River for the purpose of drawing fluids and performing ablutions. Indeed, all seemed as promised - a paid vacation.

On the next day, Don Skoal and I stood at the scale cage, eyeing one another warily as the official speeches of welcome droned on. Don was entering the Shlep and of course there was the B-17, nested in its wheelbarrow.

Now Don is an old hand, made even more secure by the private knowledge that certain arrangements had been made concerning the contest outcome, and yet his face registered tremendous strain as we listened to "...the two great contending organizations from les Etats-Unis have sent their respective champions..."

An increasingly agitated Don suddenly stepped to the speaker's podium, seized the mike and began to read a prepared statement to a startled audience. "I, Don Skoal, designer of the Heineken fighter, no longer wish to fly under the flag of the FAC. Henceforth my efforts shall be directed to support the Others...". A defection!

Pandemonium followed as the modeling press broke through the barriers to photograph Don. He continued to read:

"...while rubber scale remains first in my affections, I believe that radio control has a legitimate place..."

A disappointed audience began to boo. Cries of "traitor" were heard. A little old lady screamed out the ultimate insult, "Fike Builder!" An outraged Bob Thumbsome leaped at Don and succeeded in biting Don's ankle before being dragged away by the gendarmes. All might still have been well had not some enterprising reporter pushed a microphone into Bob Thumbsome's face and demanded a statement. Freeing an arm from a policeman's grasp, Bob slapped his plastic goggles into position and announced "...the FAC is undaunted. We have a far greater flyer to represent us..." A slowly increasing sense of anxiety began to grip me. "... a straight American who would never do anything underhanded..." I reached through my dhoti and checked my Indian passport with a sense of impending doom. It was coming ...

"...the Glue Guru. A man who has lost contests all over the world, but a man who will win this one...". Made frantic by a sense of undeserved disaster, I hissed into Mr. Thumbsome's ear "Instructions were to lose. Desist, Mr. Thumbsome. Please..."

But Bob Thumbsome, now totally transported into some heroic fantasy of his own, shook off the other policeman and strode forward to the wheelbarrow.

"The FAC will win because we are square shooters. We shall win because this model has the right stuff." And at this point he grasped the B-17 and sought to hold it up for the press. Alas, he could not budge it, although his ears purpled with the effort. For the B-17 weighed 65 pounds.

* * * * * * * *

Hours later, stunned by the day's events, Mr. Thumbsome and I sat under the bridge. The night silence was broken only by the blubbering of Mr. Thumbsome. I smoothed out the cablegram once again and re-read the fatal orders: "All right, you morons, if you think you can win - do so. We have every confidence in you. After you lose, depart immediately by cheapest available transportation to exile in Afganistan. Send back the wheelbarrow. Where is the inventory card for wheelbarrow? Reply immediately. Hqs. FAC."

Yes, Afganistan again. It would be difficult. Thousands of kilometers to traverse... Mr Thumbsome would be of little help... the blubbering is maddening...

"Mr. Thumbsome, I can well understand your sadness. Your actions today were unwise. But we still have the gift of life. All is not lost."

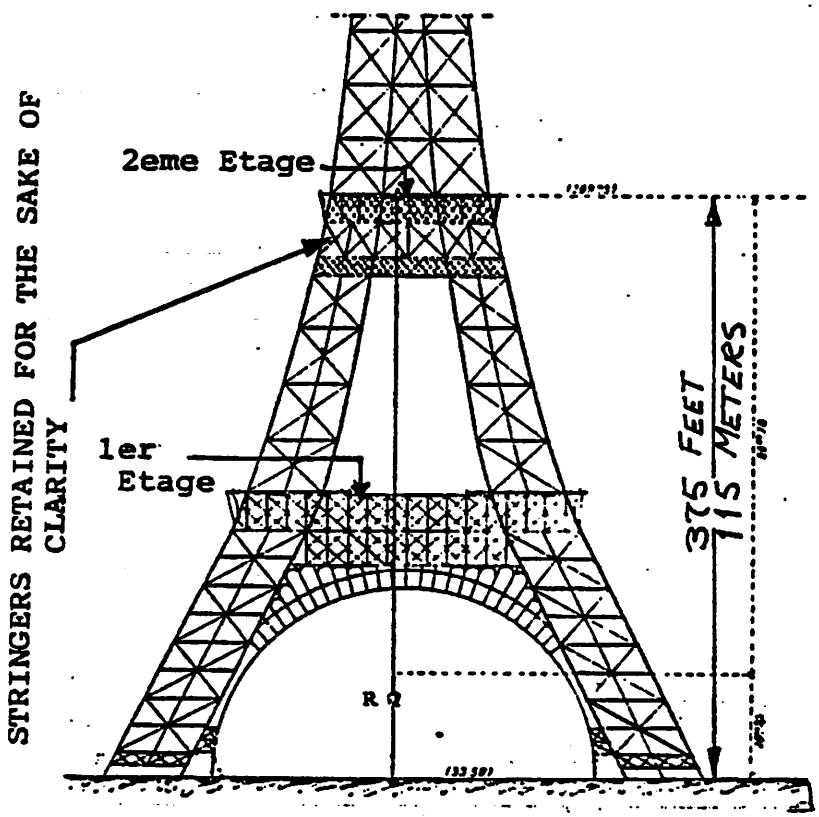
"GG, you just don't understand. I lost the inventory card!. Headquarters will never forgive me..." ,and he blubbered on.

I nodded in unfelt assent. The man was doomed. Not by the lack of an inventory card, but by the inevitable atrophy of the brain resulting from the scale judging of thousands of Peanuts. Each of these miserable creations, resembling at best a collection of toothpicks wrapped in dyed toilet paper, had taken its toll. To assign figures of merit to countless such abominations would destroy the mind of any man. Yes, even myself. One must be merciful. Still, to spend my exile with such a fellow would be grim. And yet, the only alternative was to win.

To win? For the hundredth time I reviewed the sad facts. A wing loading of 120 grams per square inch, when more than 1 is fatal. A power loading of less than 0.1% rubber when more than 20% is desirable. Hopeless. The B-17 itself had been impounded by the careful French to prevent "modifications". Hopeless. Finally, the competition - one of the best Jumbos flown by one of the best flyers in the world. Hopeless.

There was but one plus - the Grillo B-17 had received a superior static score, for mere tissue (Shlep) can never simulate metal skinning as realistically as true metal skinning. And, as the press was quick to note, the "Brillo Grillo" was rich indeed in successive layers of copper and chrome. With the static victory came one small advantage - the right to chose the flying contest site and time of day. But of what use was the advantage? This field or that field -early or late- what difference could it make? Weary of endless speculations, I put away my thoughts, stretched and ambled about.

The view in Paris is always striking. Commanding that view is -THE EIFFEL TOWER. I stopped in my tracks as though bludgeoned. My hand-held abacus leaped into action; the beads hurtled back and forth as though my life depended on the outcome, for indeed it did. Phugoid oscillation equation parameters were listed, entered and searched... Yes, it was possible. We might just win...



~ ANNONCEMENT!!! ~

GRAND CONCURS ET BATTAILLE !!!

FAC (Monsieur GLUE GURU)

contre

L'ACADEMIE (Monsieur SKOAL)

LES SNEAKERS SEULEMENT...!!!

~ TOUR EIFFEL, Paris ~

(2eme ETAGE)

RESTAURANT(***)

Premier Etage

MENU SPECIAL - PRIX FIXE!!!

Les Escargots...
Les Hamburgers...
Le Vin Rouge...
Le Coca Cola...
La Pie a la Mode...

~ ~ ~

Will FAC take over Europe? Can the 65 pound Grillo B-17 beat the Shlep? Will Bob Thumbsome return to his old sweet self? See the next issue for the exciting conclusion!

***WITH THE OTHERS IN PARIS ***

Conclusion

Mumbo Jumbo #11 from the Glue Guru aka Leon Bennett

Update: instructed to lose at a Paris Jumbo contest, GG has entered a 65 pound chrome plated Grillo B-17. However, as the result of a last moment defection by his adversary Don Skoal, GG's orders are changed- he is to win or face exile again. Aided by a dispirited Bob Thumbsome, who is mourning the loss of a wheelbarrow inventory card, GG has chosen the Eiffel Tower as the contest site. The fly-off is about to start.

* * * * * * * * *

Salutations, disciples! The night of the contest was upon us. Nervous tension crackled through the midnight air. Angry officials and cynical members of the press crowded the second stage of the Eiffel Tower, 375 feet above ground level. Working in the glare of enormous searchlights, the FAC and Others camps made ready. The anxious CD made one last attempt to alter the contest site choice.

" I would remind you Monsieur Guru, That unless your model is perceived as being higher in altitude 10 seconds after launch than at the time of launch, the attempt will be called unofficial." The CD shrugged. "Merely to make a splat on the pavement from a great height- that is not flight." I nodded agreement while busily untangling my parachute harness.

The CD continued."The lights are directed towards the tower- not outwards. Should your model fly a mere 30 meters from the tower, it will be lost in the darkness. The count will stop." Again, I nodded absently, my attention centered on attaching long shock cords to the parachute harness.

"er- Monsieur Guru- you do not intend to jump from the tower?"

"No- the opposite. I fear heights. With this leash, I can not fall off. And I clipped the shock cords to a husky rail.

The CD sadly agreed. "Yes, unfortunately you can not fall off. So I suppose we must continue. But - -" and here the CD tentatively attempted to lift a wing tip of the B-17 - -"Monsieur Guru, your honor would be satisfied if you conceded at this point. It is not within the bounds of reality that such a er- robust model should defeat one of flimsy construction."

Mr. Bob Thumbsome, hitherto brooding silently, suddenly came to life."You want the inventory card ,eh? Well, I dont have it! And if you dont stop hounding me, I'll- - " And a clearly distraught Mr. Thumbsome attempted to bite the CD, who beat a hasty retreat.

Meanwhile, Don Skoal finished his preparations and called for a timer. Moving quickly and efficiently, Don properly reasoned that only a tight circle around the tower would win. Would he go the indoor route, with a left-left setting? There was a risk here, for as the torque fell off, the circle would inevitably open, putting the model into outer darkness. On the other hand going right-right might produce an ever tighter circle as torque faded, resulting in a collision with the tower. With extreme care, he wound, tweaked the rudder a hair left and launched.

The Shlep climbed slowly as it began to swing about the tower. Too much climb and it would go out of sight; not enough and it would drop beneath launch at the 10 second check point. Don's mastery was evident as the model smoothly circled the tower on a 10 second circuit. A brilliant white when caught up in the searchlights, a perfect black when silhouetted against the background, the model swept round and round until the prevailing breeze carried it into outer darkness after 42 seconds.

The officials, much relieved that a dignified flight and respectable time was recorded despite the strange flight conditions, applauded and whistled as Don's time was posted. Don, always quiet, seemed pleased,as was I. Had he flown in daylight, three minutes would have been achieved.

Our turn. One last check of the harness and shock cords and I climbed into the wheelbarrow. A brisk winding of the four tiny motors and the B-17 was ready. Now it all depended on the phugoid theories of Mr. Lanchester and the muscles of Mr. Thumbsome. First the dull-eyed and morose Mr. Thumbsome would have to be brought into the picture.

"Mr. Thumbsome! Do you see this wheelbarrow I happen to be standing in?" A morose nod.

"Mr. Thumbsome, if this wheelbarrow disappeared over the edge of that railing, there would be no need for an inventory card!" His head rose slowly from his chest as he pondered this strange, yet liberating concept.

"Mr. Thumbsome, this model in the wheelbarrow, it belongs to the Others!" His eyes lit up with crafty comprehension. The plastic goggles were slapped into position. Action was impending.

"Mr. Thumbsome, I happen to be a secret supporter of the Others. I'm a closet RC fan."

I swiftly reached down to the bottom of the wheelbarrow and using every bit of strength given me managed to somehow lever and hoist the B-17 into a launching attitude. I turned to see Mr. Thumbsome grasp the wheelbarrow handles with steam coming out of his ears as he screamed out "Death to the Others! Death to the wheelbarrow!" Things were going well. I braced myself in the prow of the wheelbarrow in the manner depicted in the famous portrait of Mr. Washington crossing the Ganges River. Unable to move under the crushing weight of the B-17, I sensed rather than saw Mr. Thumbsome begin to sprint towards the rail, propelling the wheelbarrow and its contents as though we were but a handful of feathers. With the acceleration supplied by Mr. Thumbsome reaching the limit of human muscular capability and sparks flying from his heels, I managed to gasp out "Hurray for the Others. Three cheers for the Academy." Thus spurred on, his pace doubled. The wheelbarrow entered lift off. Moving ever faster, we smashed into the railing. The B-17 flew straight on from my outstretched arms, the massive tail nearly decapitating me. Yes, the hand launched requirement had been met and a considerable velocity imparted to the model, enough to result in a small zoom. Tumbling headlong over the railing, I barely glimpsed the wheelbarrow as it departed for points unknown. Brought to a stop by the checking action of the shock cords, I swung from the railing. Looking up, I saw the model climb a dozen feet, hang for a moment, waver and then break for earth. Suddenly just a winged bomb, the model accelerated to the accompaniment of a slowly rising wail passing over into a scream. The startled timer rushed to the railing to catch the precise instant of the crash - but there was no crash. For the huge tail of the B-17, freed from the stuffy confines of the wheelbarrow and operating in a generous air stream at last, proved capable of guiding the CG of the model into a phugoid trajectory. The plunge stopped and the model zoomed upwards like a giant yoyo on an invisible string. The critical point was approaching. Something like 10 seconds had passed since launch- would the trajectory peak exceed launch height?

Speechless, the judges crowded the rail as the model approached. A faint whirring of the tiny props could be heard- each contributing less impetus than a flea breaking wind. Yet everything counted, from Mr. Thumbsome's launch velocity to the four Peanut props. For unless the energy consumed in drag is replenished, each succeeding peak in a set of phugoid oscillations will be lower than the proceeding one.

With the model pointing straight up, the B-17 continued to coast silently, trading velocity for altitude. Swinging from the shock cords securing my harness, I could do little but urge on the Brillo Grillo as it went by on its critical mission. As velocity decreased further, almost to zero, the timer reached above the railing and called out "10 centimeters positive". The check point had been passed! With groans of disgust, The officials settled back for the duration of the flight.

Again the B-17 wavered and broke for earth. Like a basketball rebounding from an invisible floor, it shot up and down, each drop and return resulting in a lower peak and yet another cycle. After many cycles the prevailing wind nudged the model into the main tower structure. Hesitating but slightly, the model sliced through the cheap steel with little effort. Desperate to end this most unconventional of flights, the timer ruled interference. The flight was over. With more than one minute on the clock, the Brillo Grillo had won!

There was no celebration. The stunned judges, deep in thought, left in

haste. Soon all had departed the contest site except Mr. Thumbsome and myself. "Mr. Thumbsome, it is I , the Glue Guru, your friend and accomplice, who is hanging from the railing. Haul me up!"

Dark suspicion clouded his brow. "You look like an Other to me. One I used to know- the smarty pants with no pants."

"You mean the wheelbarrow pilot?"

"yes, that's him. Whatever happened to him?" This was going to be difficult.

"Mr. Thumbsome, we both know how treacherous low aspect ratios can be. Too much center of pressure travel. And that wheelbarrow had no tail area to speak of. Straight into the Seine River."

Mr. Thumbsome glowed with delight. "Tell me about it"

"I just did."

"Well, tell me again. About the Other going into the drink."

"Mr. Thumbsome, it is difficult for me to shout across this gap. If you'll haul me in, I'll tell you the story again."

"About the Other going into the drink?"

"Yes"

"That's a great story. I'm going to write the whole thing out. OK, I'll pull you up, but dont forget the details in the meantime."

* * * * * * * * * *

Mr. Thumbsome's book "Fighting the Wheelbarrow Menace" , an account of the Paris adventure, was chosen by the Paranoid Book Club and went on to become a best seller. Miss Streep will play his role in the movie.

As for myself, I have returned to a life of peaceful meditation. It is warm in the cave again. The Glue Guruess, clad in a designer sari brought from Paris, is busy working the foot treadle, thus energizing the computer, as she pursues studies of a rubber powered quarter scale Piper Cub. Thanks to Mr. Lanchester's phugoid theories and Mr. Thumbsome's energetic distaste for the Others, I have survived The Great Paris Contest. Soon it will be time for dinner. I am content.

HAND LAUNCH TECHNIQUE FOR GRILLO MODELS

