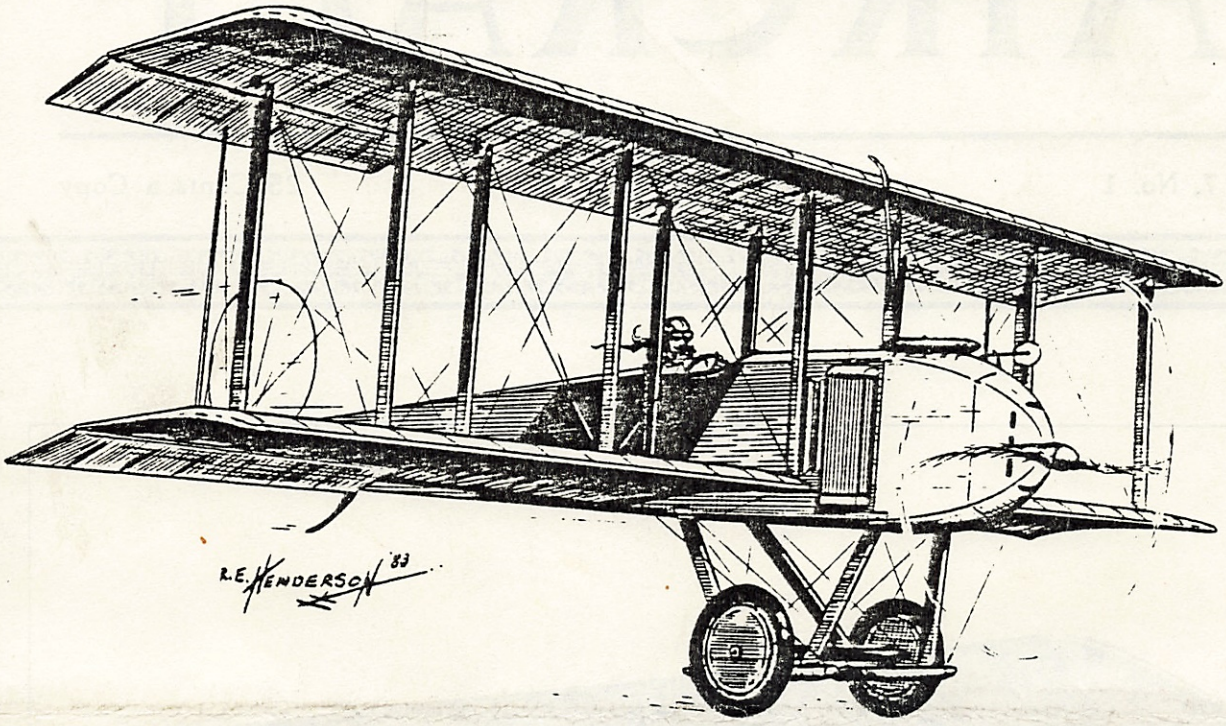
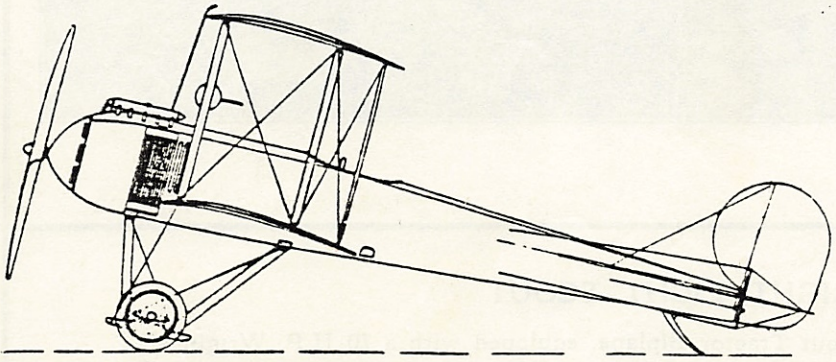
CROSSWINDS

NO. 68
1Q '83



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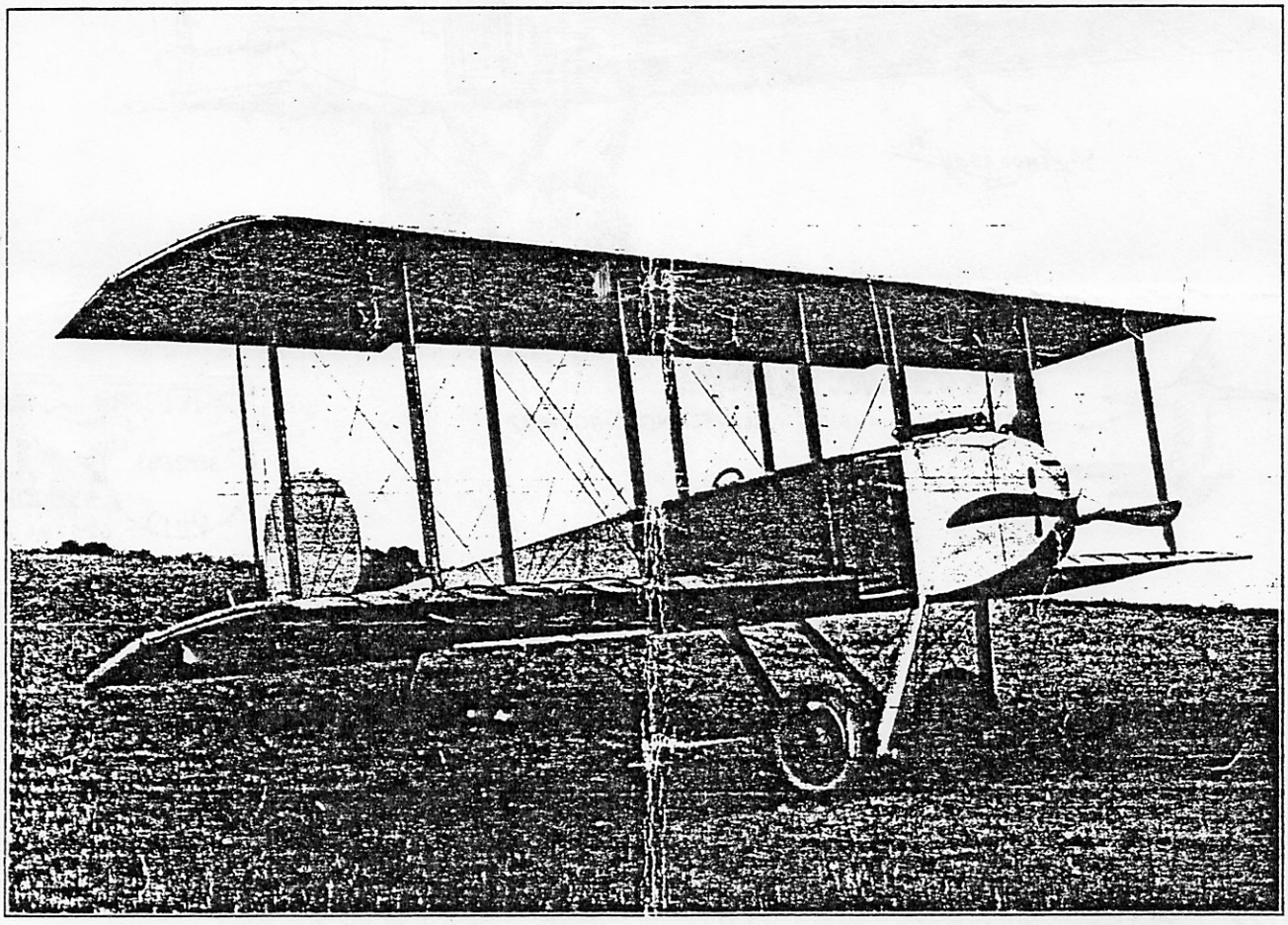


·W·R·I·G·H·T· MODEL "L" LIGHT SCOUT·

2
COURTESY W.C. HANYAN

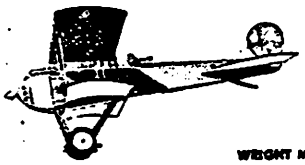
AIRCRAFT

Vol. 7, No. 1 AUGUST, 1916 25 Cents a Copy



WRIGHT LIGHT SCOUT

The Wright Model "L" Light Scout Tractor Biplane, equipped with a 70 H.P. Wright six cylinder motor, with a speed of from 25 to 81 miles per hour. See plans and description in this issue.



CROSSWINDS QUARTERLY

THE JOURNAL OF THE CLEVELAND FREE FLIGHT SOCIETY

VOL. 10 NO. 1
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1 Q, 1983

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EDITORIAL COMMENT

Last February CFFS held an indoor contest at the Estabrook Recreation Center, Cleveland, Ohio. Most everyone was pleased with the flying site and since the management has assured us that there will be no more A.A.U. Boxing shows scheduled, to interfere with the preparation of the gym for a model airplane contest, we are tentatively planning meets for November 1983 and February 1984.

November's activity will be directed by Dave Pishnery and will feature EZB, Scraps, GHQ Peanut and Indoor HLG. I will direct a six event contest in February, probably on the Sunday before Presidents's Day. This contest will see EZB. Scraps, Jetco ROG(revised rules), FAC Peanut, No-Cal, and HLG as the events.

After much thought and discussion with club members, the following revisions to the Scraps and Jetco rules will be in effect for the February 1984 contest. In the Scraps event you will be allowed to fly other small indoor types with a 9" maximum wingspan and condensor or tissue covering. Each ROG will be examined by the CD for structural authenticity according to the CFFS reprint of the plan. Wood sizes may be changed but no hollow motor sticks, cambered wing due to altered wing ribs or baggy tissue. The prop must be plastic and modified only by sanding thin. The model must weigh at least 3.5 grams* The 3.5 figure is reasonable since I recently completed a test model using the lightest indoor wood I could find at the plan specified sizes, which weighed 3.7 grams. *(WITHOUT RUBBER)

Concerning last February's contest, did you know there were 38 registered entrants that included seven juniors, and that the club actually did not lose money for the day? The winning flight in EZB was ten minutes plus and there were a few ninety second peanut times. Besides the contestants there were many interested observers. With this kind of competition and support we will be happy to sanction future meets. Also of note is the fact that Walt Van Gorder, of Cincinnatt, Ohio, set a AMA Category I record of 8:36 with his penny-plane. At all our future indoor meets you are welcome to try for records.

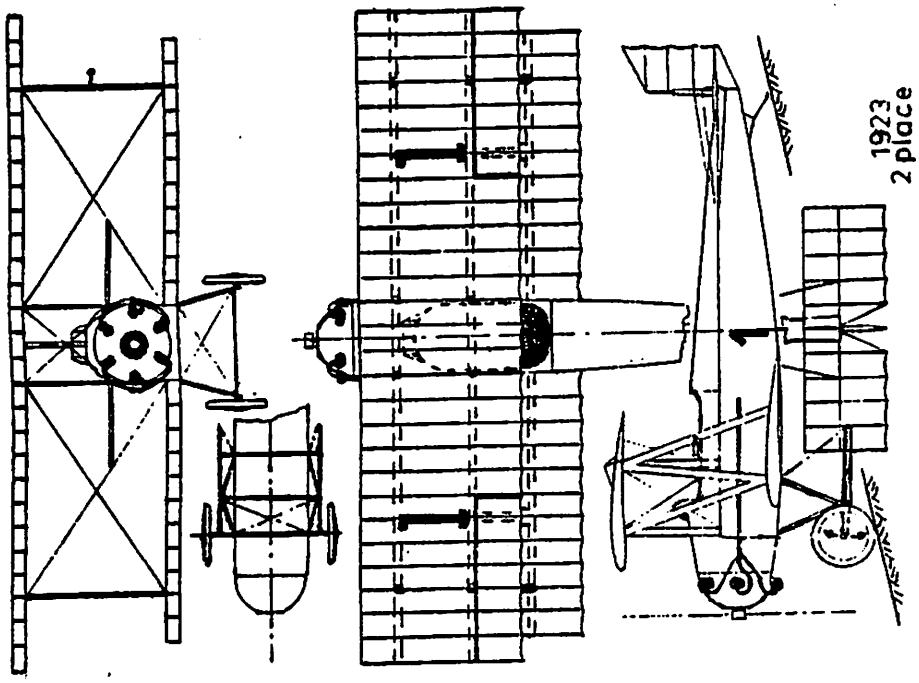
In this issue I have included several items that can help you planfor February's contest. I was impressed with Vic Peres' No-Cal Farman Bipe. I thought of a similar subject and proceeded to draw up the Wright Model L Scout as a indoor No-Cal. Please observe the revised FAC rules for the event. Markings for this biplane are hard to come by but at least include your control surfaces.

So much for indoor activities, now here are a few other items that I hope will be of interest. Those of you interested in the Gadfly, currently featured in the May 1983 Flying Models as a jumbo FAC subject and the November 1981 Model Builder as a peanut, might have use for the proof of scale data that I found at the Cleveland Public Library. The xerox copies are to light to publish but if you need them then send me an S.A.S.E.

My own personnel fleet of models are ready for this years' flying season. I completed an 18" Fokker D-7 for WWI Combat & FAC Scale. I also converted my Waco Coast Guard to CO2 power. I suggest that all of you that are interested in CO2 power scale try modifying an old model so that we can have a larger participation in this event. The last building project of the winter was a Dayton-Wright Racer that I built with almost all of the kit's materials. I modified, as Russ suggested in the third quarter 82 newsletter, as raced in 1920-#2. The Jetco kit is a good value but not a particularly fun project. While on the subject of kits I like the Jetco Embryo, the Eaglet. My younger son David and I are having a good experience with it. We are able to use the kit materials and the die cut parts are adequate and save a lot of time.

And finally, do any of you remember the Jack Armstrong-Wheaties card models? If you fly WWII Combat this summer you just might win an exact replica from this series of fourteen. I think I had everyone when I was a youngster. My recollection of these was of a bigger model but of course I was a lot smaller then. These card kits will be fun for those who enjoy such trips into the past.

Michael C. Zand
Secretary-Treasurer of CFFS



Farman Sport: 60-hp Anzani; span, 23.3 ft; length, 20 ft; area, 280 sq ft; empty weight, 445 lb; gross weight, 880 lb; maximum speed, 87 mph; stalling speed, 35 mph; normal range, 200 miles.

3-View Courtesy Benno Sabel W. Germany.

CROSSWINDS

#68 10/'83

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Flat Hatin' Lightly on The Wright L

Russ Brown 8/'83

The ultimate Wright Brothers biplane rolled out on the War Department tarmac in 1916 as the Wright Model L Light Scout. All Wrights do not look alike (or wrong!) The Model L was an attractive blend of 1916 "state-of-the-art" with considerable hold over of classic early Wright Brs. concepts. As enthusiastically described in August 1916 AIRCRAFT, the Model both flew right and looked right. War Dept. requirements for a light scout with easy flying and upkeep resulted in a new European style tractor biplane with sharp nose planked fuselage and contempary movable control surfaces in place of wing warping. Evolution of the Model L with characteristic thin cambered airfoil on multi bay wire braced wings and no dihedral developed along lines of the Wright Model K twin float U.S. Navy biplane. The Model K was more traditionally Wright, retaining wing warping with dual chain driven tractor props. The engine was enclosed behind a nose radiator in a full fuselage with a ballanced rudder, as shown in the book UNITED STATES NAVY AIRCRAFT SINCE 1911. Only one Model K was sold due to poor 50 mph performance vs. 82 mph Glenn L. Martin S Seaplanes or 69 mph for the 1914 Curtiss F Boat.

The Model L reduced the Model K lines to a practical, small light tractor biplane with a completely cowled in engine in a sleek gray planked fuselage. The sharp metal nose enclosed a flexible connection shaft extension linked by 8 "endless rubber bands" (16 big strands!) to 8 studs on the fly wheel. Above the engine cowl is a cylindrical tank or manifold, and 6 exhaust stacks up to the left. Ever so many serialized rigging wires were looped on non-adjustable hooks. The pilots' feet operated engine spark advance and throttle arms, while the stearing wheel (probably 4 spokes) operated the ailerons. A hand lever for the rudder cables could be hand held to the stearing wheel for coordinated turns.

Top and side views compare well with the exceptional 22ft. 'span British and Colonial Airplane Co. 1914 Bristol Baby Biplane designed by the inspired Scot. Frank S. Barnwell. As the Bristol Scout C, this 80 h.p. rotart powered biplane was stretched to 24 ft. 7 in. span, and was immediately and ever more the best liked light scout of WW I. This popularity is sustained even now at WW I replica Headquarters WW 1 AERO by editor Leo Opdycke at 15 Crescent Rd., Poughkeepsie, N.Y. 12601 ($6 for Bristol Scout Issue #58, or donations $16 up per year). By comparison with this prooven Bristol Scout C, the new Wright Model L was 20% larger and a full half again heavier, with less power. Even so it was looked on as a promising and most modern evolution of the Wright Flyer. It was also to be the last of the line, as the Glenn L. Martin Company and the out-of-production Wright intrests combined with the Simplex Automobile Co. and the General Aeronautical Corp. as the Wright-Martin Company. Production of Martin designs continued in September 1916 as Wright-Martin airplanes.

We are indebted to Bill Hannan for the crisp copy of the entire August 1916 AIRCRAFT article. Full detail is shown on the 1/20th plan sized for the Brown Jr. Campus Bee ($35 at Peck Polymers or Micro-X). Full known detail may be built up, or make it a light scout by omitting wing ribs and fuselage sheeting. The scale size stab. is big enough at 13% WA on a 2 3/4 X wing chord arm, but the 2.5 % rudder looks too small to turn well. A light Peanut Scale plan BH-115 of the Wright Model L by Fred Weitzel, drawn by Bill Hannan is available from Peck-Polymers P.O. Box 2498 La Mesa CA 92041. Now, PEANUT POWER author Bill Hannan transcends the perils of publishing to offer his SCRAPBOOK of SCALE 3-VIEWS & NOSTALGIA, Volume 1. Early warning of this chance at an autographed Hannan sent vibrations back to the tail hook (wallet) To share the joy and stimulate creativity, we have directed this offering to the CROSSWINDS Team, where the ever inspiring Hangar rash may spread to visual effects. Now lets drop a frantic May Day to devotees to save up $8.95 plus $1 pp. Bill is gonna' break an arm on the demand for autographs, and you are sure to want your own copy. NOW is not a bit too soon to start planning for FAC NAT'S IV somewheres up North in Rottenville Sector.

B

Constructional

AEROPLANES :: DIRIGIBLES

WRIGHT LIGHT SCOUT

Tractor Biplane

The new Wright model "L" Light Scout tractor biplane was designed to fill a demand for a machine of moderate power, light weight, economical upkeep, ease of control and with both high and low speed qualifications. These qualities are in direct contrast to the old well-known "Model B" twin-screw pushers, which are noted for their slow flying qualities. This new machine gets off very quickly, even at low speeds, and has a range of from 25 to 80 miles per hour. An observer gets a novel impression that the machine is flying without effort, while the ease of control is remarkable. While primarily designed for light military scouting upon lines laid down by representatives of the War Department, its light weight, small dimensions and other qualities make it a machine particularly suitable for the sportsman owner. Simplicity has been expressed in every detail, which, in the event of necessary repairs, enables the latter to be carried out with maximum despatch and minimum expense. Too, the quick rising abilities make it a machine particularly adaptable to fields where a lafger plane would be out of the question. This makes it a particularly good machine for exhibition or kindred flying.

Main Planes.

The top and bottom planes are identical in shape and size, the upper being in three sections, and the lower in two, which are interchangeable in a vertical direction. The wings are readily demountable from the body section for shipment or motor-haulage, and the upper sections are attached to each side of the top central section. The lower sections attach to short surfaces four inches wide, which are affixed near the bottom of the body. The center struts run from these small planes to the central upper plane section. This is a new system not found in the general types of tractor biplanes. The wings are thus entirely separate and individual units. There is no wing surface underneath the body. The lateral spars are of spruce and of ample dimensions. The ribs are of solid spruce, of I-beam section, with the webs drilled out, and are spaced on 12 inch centers. The planes are amply braced internally with wire. The entering edge is 6 inches from the front beam, while the trailing edge is 24 inches back from the rear plane beam. The cloth is Irish linen, doped, varnished, and held in place by means of spruce strips.

The struts are solid, twelve in number, of spruce, and streamlined, with very little head-resistance. They are thin and 3 inches deep throughout, except at the ends, where they taper to the fittings which are set on hook-plate anchorages, to which the solid guy wires are formed with eyes securely soldered, loop over the hook-plates under the strut ends. By taking out a small bolt which runs through the strut and its fitting, the struts are slipped out, releasing the wires from the hook-plates. No turnbuckles are used in cross-bracing. Solid wire is used instead of cable, doubled where the load comes. The wires being standard length, with eyes formed at each end and ferrules securely soldered. These are sent from the factory ready for installation, and can be duplicated exactly in length and gauge, as each one is given a number for ordering purposes similar to that adopted in the automobile manufacturing industry for repair parts.

Fuselage.

The fuselage is of the usual box-girder construction, tapering to a vertical knife edge at the rear, which serves as the support for the vertical rudder. The longitudinal spars and vertical struts are of spruce, and a special fitting has been evolved which obviates the necessity of bolts passing through the spars. The entire body is strongly braced with wire. The nose is covered with sheet aluminum, painted gray, with very large doors rendering easy access to the engine. The decking is of veneer, covered with linen, which also covers the rest of the body, doped, painted gray, and then varnished, thereby giving a very neat appearance. Where control cables pass into the body, brass eyelets are used to prevent wear and tear. The pilot's cockpit is a very comfortable one, located under the trailing edge of the top plane. In front of the pilot is the instrument board, and between that and the motor, the fuel tanks are located.

Landing Gear.

The landing gear is of the two wheeled type, and very simple. The chassis struts are of ash, which mount onto short skids. The wheels are 26 inches by 4 inches, with their spokes enclosed by aluminum discs, and are mounted on a steel tubing axle. The shock absorber is of the regular Wright type, using rubber bands and special metal fittings. The whole landing gear is wired and cross-braced to the planes on both sides of the body. The tail skid is of the enclosed-spring type, made of ash.

Control Planes.

The lateral equilibrium is maintained by double-acting ailerons, each 7 feet by 2 feet, located in cuts in both the top and bottom planes. These ailerons are hinged to the rear lateral spars and have a slight curve, which makes them normally actual lifting portions of the main planes. The upper and lower ailerons are connected by a thin spruce strut-spacer, located just back of the outer rear main plane strut. The control cables run from the spacer-strut ends over pulleys at the upper and lower extremities of the adjacent main plane struts and along the planes to the steering column. The cable from the lower ailerons runs to the top of the strut and vice-versa. The aileron surface is ample enough to insure very easy control.

The vertical rudder is of the balanced type, supported by the vertical knife edge of the body. It is well braced by wires running to the body and stabilizer, and is operated through a rudder bar by cables running into and through the body to the control column.

The elevating planes are double, of customary design, operated by cables from the masts to the control apparatus, and are hinged to the rear edge of the stabilizing plane.

The stabilizing plane is of the split semi-circular flat type, and is adjustable for balancing purposes.

Control System.

The control system is the regular Wright type, where turning the wheel to the right or left operates the ailerons, rocking the wheel and its supporting column operates the elevating planes, while an aluminum hand lever swinging in the arc of the rim of the wheel, operates the rudder. This lever can be used to operate the rudder alone with very little pressure, while gripping both the wheel and the lever at the same time in one hand causes the rudder to turn simultaneously with the operation of the ailerons, otherwise, the ailerons may be operated independently. This is accomplished by the aileron and rudder cables terminating in chains which pass over sprockets mounted on the steering column. These sprockets are on the same shaft, the aileron sprocket being rigidly attached to the axis of the wheel, while the rudder sprocket is attached to the lever, whose handle fits snugly around the rim of the wheel, which, when gripping both the lever and wheel in one hand, causes both sprockets to act simultaneously, producing the turning and banking actions at will.

Power Equipment.

The power equipment consists of the latest Wright six-cylinder water-cooled motor, of 4⅜ inches bore and 4⅝ inches stroke, rated at 70 horsepower. The motor is entirely enclosed in the body, its exhaust pipes projecting through the top of the body. The entire motor compartment is metal covered, with doors for ready inspection. The engine may be primed from the seat. The engine is controlled by the feet, the right foot pedal controlling the throttle, while the left takes care of the magneto advance. Between the two is a magneto-cutout pedal-switch or button.

The propeller used on this machine was especially designed, and has an exceptionally narrow blade and a high pitch. These propellers developed a strong tendency to split, and experimentation led to covering the blades with linen, doping, and then varnishing with a final high polish, which reduces skin friction, and improves the appearance, as well as making the blade much stronger. The hub is fitted with a cone of sheet aluminum.

The propeller is mounted on a short shaft which forms part of the Wright flexible propeller drive. This short propeller shaft is keyed to a steel disc which is concentric with a light fly-wheel keyed to the engine crankshaft. From both the fly-wheel and disc there projects eight studs in each one.

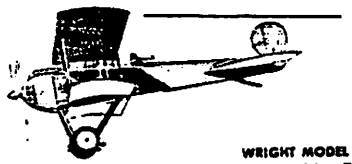
and over each pair of these studs, one on the disc and one on the fly-wheel, a short but very heavy endless rubber band is passed. These bands transmit the full power of the motor to the propeller and absorb vibration and sudden or violent strains on the propeller or engine shaft.

The radiator system consists of two flat tube radiators, mounted one on each side of the body nose. These radiators are each 30 inches high, 5 inches thick and 11 inches wide. They are quickly demountable by unfastening retaining straps which hold the radiator to plates attached to the body framing. The hose connections are readily removable.

The gasoline tank is located to the rear of the engine, enclosed in the fuselage, with 12 gallons' capacity. Force air-pressure feed is used, with the gasoline gauge, air-gauge and hand pump mounted on the dash in front of the pilot.

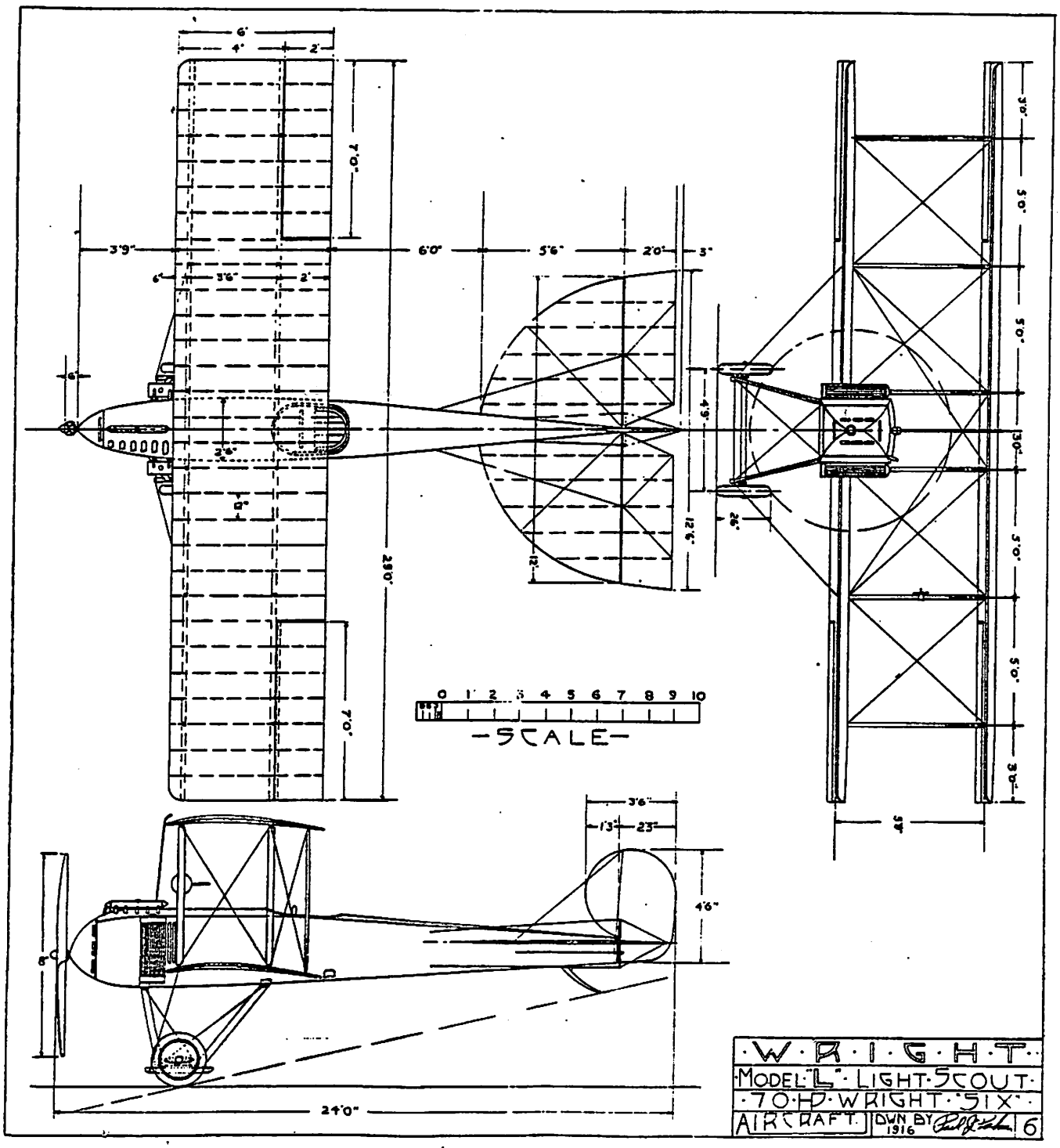
Instruments.

The instruments on the dash in front of the pilot include clock, aneroid barometer, slip-gauge, etc. On a strut, in plain view of the pilot, is mounted the Wright angle of incidence indicator, which gives at all times the angle of the chord of the planes with respect to the air currents through which the plane is passing. This instrument is entirely independent of gravity, in contra-distinction to the ordinary inclinometer, which takes no consideration of ascending or descending air currents. This reduces the likelihood of stalling or dangerous diving unawares to the pilot, thereby adding to the safety of flight.



WRIGHT MODEL "L"
One of the most detailed Peanuts, as designed by Fred Weitzel. Primarily an indoor model featuring delicate construction. 12" span, stick & tissue BH-115.. $1.25 ORDER FROM

Peck-Polymers P.O. BOX 2498 LA MESA, CALIF. 92041



AMA Record Trials and FAI Team Selection
January 9, 1983, St. Mary Magdellan Church

We couldn't have asked for better conditions as the outside temperature was 43° and sunny for most of the day. Drift was neglegible and the air buoyant until around 3:45 P.M. We set the rounds at six and usually had at least one FAI ship up a time. Larry Loucka had an excellent flight going and just started coming down around 18 - 20 feet at 13:20 or so when he had a collision. As it turned out he still got the cat. I record at 13:27, but from that height a realistic time of 18 min. could have been had. A pity really, seeing that he had the record beat handily. That put an end to his flying as he had a 9:+ first flight on the board. Dave Rigotti shared a similar fate but was able to repair his ship and steadily increase his flight times. By the time he was ready for a big one, the air had deteriorated. The change in air temperature was really noticable. Larry Loucka looked as if he had it sown up for 1st. But low and behold, Dave Rigotti came through with a fine 12:02 to match his earlier round 11:__ to beat Loucka out.

In third place Paul Loucka put in two steady flights from not much altitude to nose out Larry Mzik who has to deserve a reward for persistant trying. He continuously worked on his ship throughout the trials and if he would have changed to more power earlier, the outcome would have been tighter.

On the other side of the gym, Gerald and Robert Skrjanc were quietly putting up flights for record purposes only. Robert impresses me as being a natural - very knowledgable and active. I hope I didn't hurt his feelings about his A - R.O.G., but my ignorance for checking his specs was showing. I might add that written calculations and drawings would greatly help matters in processing, but I was receptive to his explanation of the ship. Gerald and his son had a very productive day as they set the following Cat.I. records:

Robert Skrjanc	Larry Loucka
Jr. Paper Stick	Open AMA Stick
Jr. EZB	Open FAI Stick
Gerald Skrjanc	Paul Loucka
Open A - R.O.G.	Jr. AMA Stick

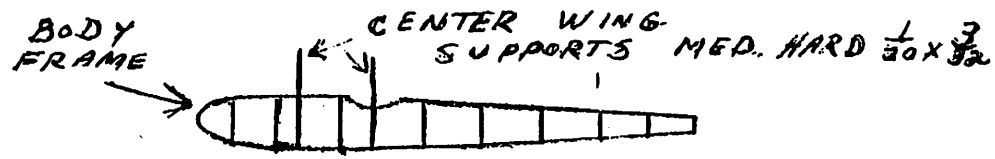
Good times can be achieved in low ceiling halls and gyms but several factors play an important part in there make-up. One is co-operation by all parties. Two is judicious use of steering un official ships away from good flights in the making and three knowledge of your own ship and its potential. Without encouragement from other and good natured "egging" from fellow competitors, these meeting would be dismal funeral-type affairs. I thoroughly enjoyed myself to the point of renewing my interest in indoor and I look forward to other chances to fly.

Dave A. Pishnery
CD, AMA #50088

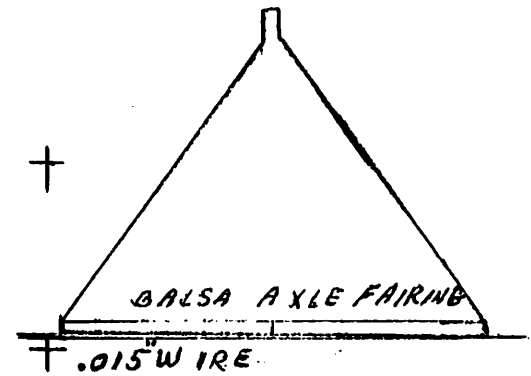
WRIGHT "L" LIGHT SCOUT

NO-CAL SCALE

BY MICHAEL ZAND



PROP - 6" BENT WOOD STYLE.



MOTOR STICK
3/32" X 3/16" MED. HARD
DO NOT GLUE AT X UNTIL THRUST LINE IS ADJUSTED (OR TACK GLUE)

6

CONTEST RESULTS

Sunday, February 20, 1983 — Estabrook Recreation Center

EZB/Pennyplane (Open)

Name	Best Flight
Jack McGillivary	622
Gerald Skrjanc	551
Larry Mzik	547
Larry Loucka	543
Robert Mullins	483
Garry Hunter	414
Walt VanGorder	411
Dave Rigotti	373
Victor Peres	359
Chuck Slusarczyk	341
Frank Kieser	271
Dave Pishnery	242

EZB (Junior)

Name	Best Flight
Robert Skrjanc	324 & 343*
Paul Loucka	324 & 73*
Kathy Loucka	307
Mike Peres	222
Lee Wallace	185
Brian Gibbs	164
Don Slusarczyk	DNQ

* Flyoff

****

SCRAPS (Open)

Chuck Slusrczyk	238
Robert Mullins	176
Gordon Roberts	120
Frank Kieser	92
Robert Wallace	74

SCRAPS (Junior)

Brian Gibbs	65
Lee Wallace	60

****

R.O.G. (Open)

Larry Loucka	163
Walter VanGorder	152
Robert Mullins	147
Robert Wallace	77
Chuck Slusarczyk	75
Michael C. Zand	63

R.O.G. (Junior)

Paul Loucka	105
Don Slusarczyk	75
Jason Hart	60
Scott Woodward	58

****

No.Cal Scale

Victor Peres - Farman Sport	325
Walt VanGorder - Fike	258
Ken Groves - Bonzo	227
Gordon Roberts - Howard DGA	94

F.A.C. Scale

Jack McGillivary (39 +87)	D.H. Sea Hornet	126
Ken Groves (37 + 76½)	Sopwith Tripe	113½
Michael Zand (15 + 49)	Rearwin Sportster	64

F.A.C. Peanut Scale (Open)

Flyer	Model	Flying Points	Scale Points	Total Points	Place
Victor Peres	Farman Sport	62 (56)*	73	135	1
Jack McGillivray	SE-5	58 (39)*	77	135	2
Victor Peres	D-7	67	63	130	-
Michael Zand	Bleriot Canard	32	90	122	3
Ken Groves	Sopwith Tripe	51	69½	120½	4
Garry Hunter	Lacey M 10	63	48	111	5
Garry Hunter	Waco SRE	38	67	105	-
A.A. Balunek	Waco E (Mil)	35	69	104	6
Gordon Roberts	Lacey M 10	52	49	101	7
A.A. Balunek	Waco E	27	67	94	-
Lad Plachy	Piper J-3	30	48	78	8
James McClaskey	Cougar	26	47	73	9
James Lane	Cougar	25	42	67	10
Andy Medovitch	Hein	DNQ	66		
Lou Leifer	Volksplane	DNQ	64		
Clyde Francis	Piper J-3	DNQ	50		
J. Harris	Lacey M 10	DNQ	49		
James McClaskey	Ganagobie	DNQ	49		
David Narance	Pietenpul	DNQ	48		
Ken Groves	Fike	DNQ	48		
Clyde Francis	Cougar	DNQ	46		
David Narance	Monocoupe 90A	DNQ	44		

* Flyoff

F.A.C. Peanut Scale (Junior)

Mike Peres	Farman Moustique	63½	60	123½	1
Mike Peres	Farman Moustique	60	60	120	- (reenter)
Jason Lane	Cougar	28	38	66	2
Robert Zand	Taylorcraft	10	04	14	3

Credits

Thanks to: Lisa Adkins, Donna Zuppan and Tim Reilly. Three of my loyal band students of Rhodes Senior High School who helped us with timing and the contest headquarters.

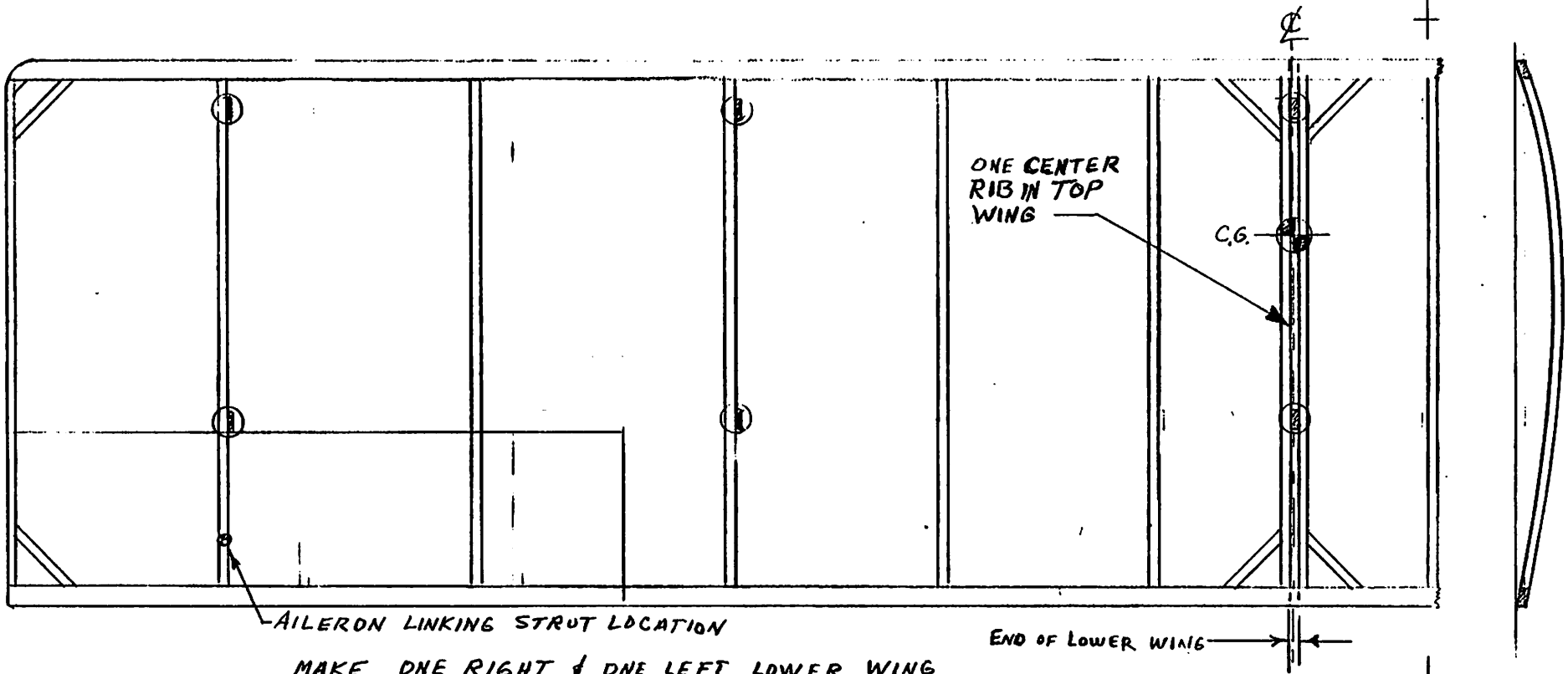
Micro-X, Majestic Models, Peck-Polymers and National Hobby who contributed prizes.

Also: To the City of Cleveland's Department of Recreation and the staff of Estabrook, especially Mrs. Jean Vana.

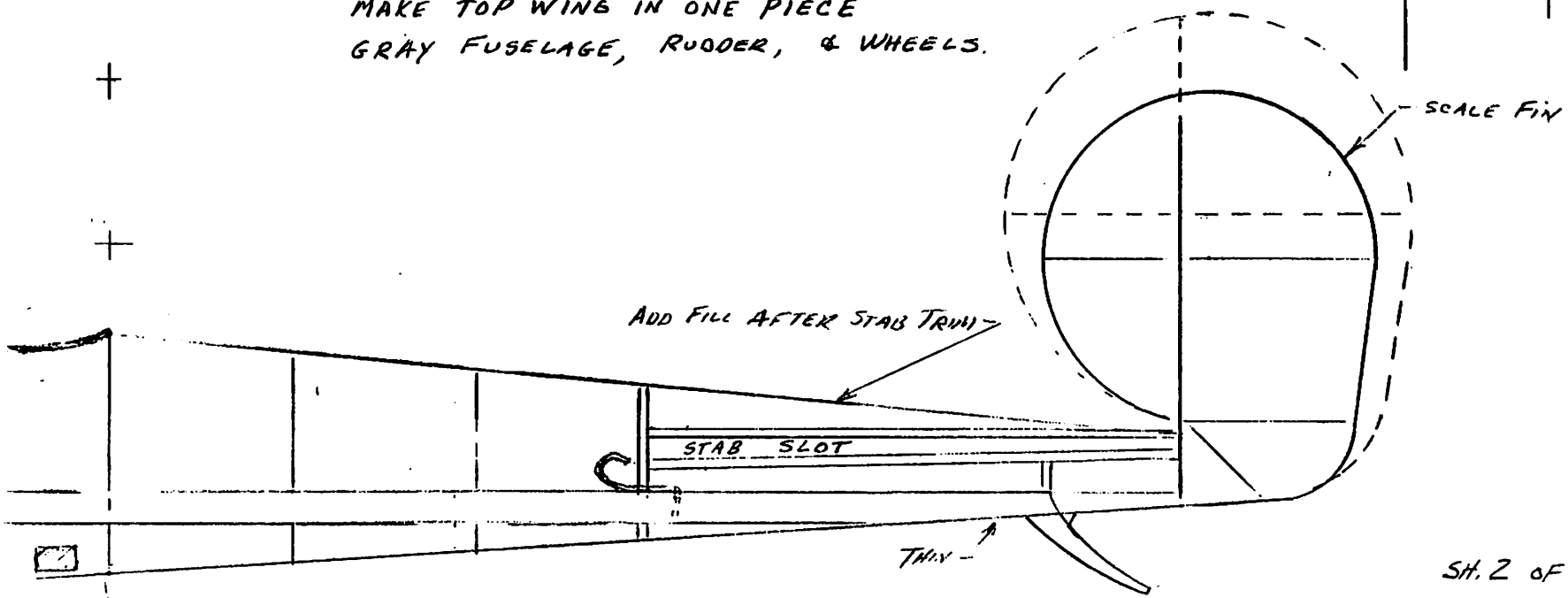
To Russ Brown for the painstaking job of judging all the scale entries.

Michael C. Zand

March 6, 1983



MAKE ONE RIGHT & ONE LEFT LOWER WING
MAKE TOP WING IN ONE PIECE
GRAY FUSELAGE, RUDDER, & WHEELS.



**********PERFORMANCE**********

Mumbo Jumbo #5 from the Glue Guru by Leon Bennett

Salutations, disciples! Today we shall meditate on flight performance. A means of calculating the flight duration of any rubber-powered model will be presented. By performing a few computations you will be able to sift out the hopeless cases and mad dreams before construction.

Do I sense resistance? Do you equate your next project with your next romance and fear that too assiduous an accounting of your intended's charms may destroy the very atmosphere necessary for affection? There is something to this concern. Compulsive counting and recounting of a dowry does smack of something less than true love. Yet, in this valley of tears, a certain amount of rational assesment is a necessary thing. If your intended has already buried seventeen husbands, it will pay to check the contents of the soup very carefully.

It is in this spirit that we shall do performance analysis. Not to squeeze out every possible second of duration, for that is best left to the Wakefield crowd, but rather to make sure that the soup does not taste of bitter almonds.

A further advantage of these calculations is the ability to test planned modifications to an existing favorite before resorting to surgery. Is it really useful to move the rear peg backwards so as to employ additional rubber, at the expense of more ballast up front? Is it worthwhile to extend the wing of that clipped Piper Cub, Hughes Racer, or whatever?

Finally, familiarity with these numbers may change the manner in which you view configurations in general. The cosiness of side-by-side seating and the resulting fat fuselages are things I have come to disdain. Give me that isolated tandem seating arrangement in a skinny fuselage and I've gained a few seconds; a few seconds that I will gladly pay out for spats or whatever moves me.

The actual analysis comes in two versions--Short Form and Federal Case. They differ primarily in the complexity of the information they can digest. If you have something reasonably conventional in mind, use the short form; if you are breaking fresh ground, go to Federal Case.

Short Form

The following information is required:

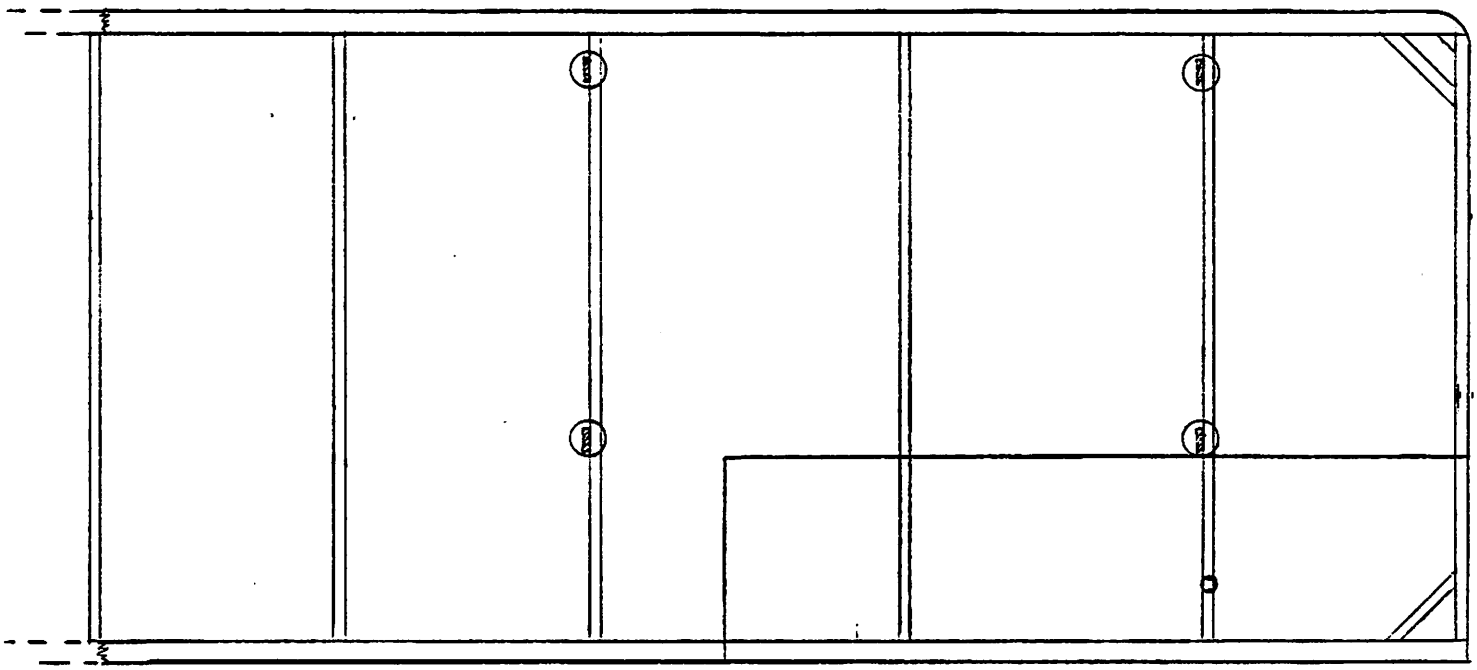
1. The wing area in square inches, S
2. The flying weight (including rubber) in grams, W
3. The weight of rubber in grams, R
4. The glide ratio, in pure number form, G

Of these four items, the first three are straightforward. To convert square feet to square inches, multiply by 144. To convert ounces to grams, multiply by 29.

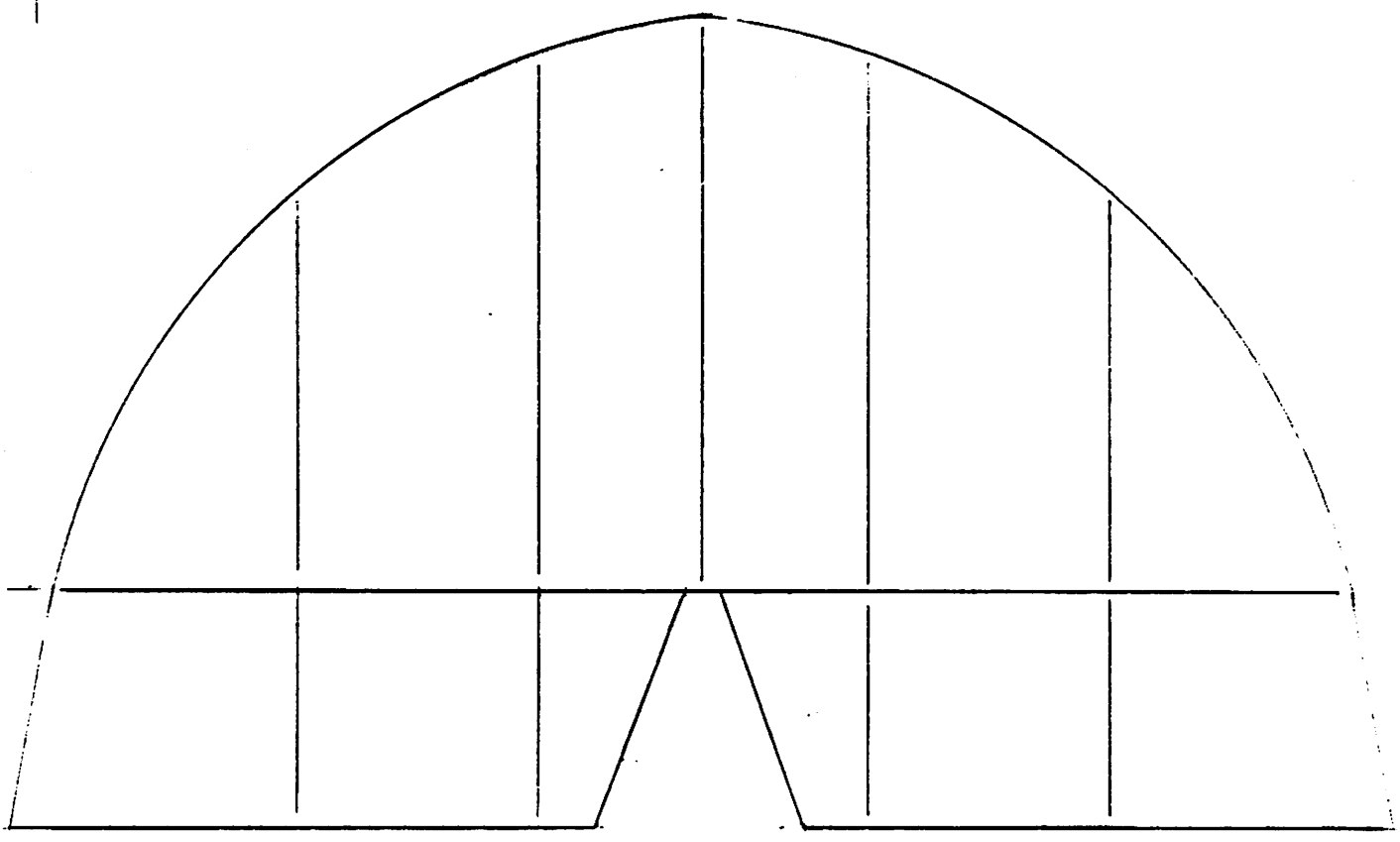
The last item, glide ratio, takes careful judgement. At issue is the distance the model will travel forward for every foot of drop. Imagine that you are gliding the model and that your launch is perfect. From a typical launch height of six feet, how far from your feet will the model land? If the distance is, say, eighteen feet, then the glide ratio is three, or 18/6.

To help make a judgement, check the scale below. Listed are known and computed glide ratios of models in the Jumbo size category. The Spitfire is in the "retracted gear" form. The Tailwind has a particularly large and boxy fuselage cross-section. The Ford Tri-Motor was fully detailed and flaunted every detail known to man. Those 1930's Wakes had a generous fuselage cross-section and a full, although spindly, landing gear with no wing struts.

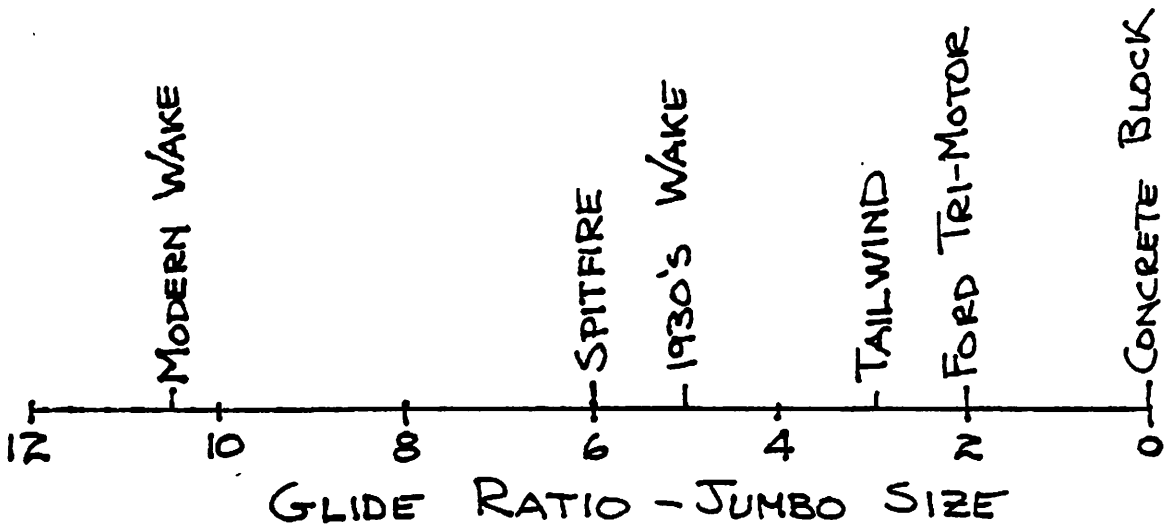
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SCALE WING HAS 1/6 DIHEDRAL; 5/8" OPTIONIAL.



ANTIQUE TAN FABRIC COLOR - WINGS AND STAB.



GLIDE RATIO - JUMBO SIZE

Still in doubt? If the configuration seems really clean you might go with 5; if of average drag go with 4; if fairly draggy--big fuse cross-section and lots of struts--go with 3. If none of the above seems to fit, go directly to Federal Case.

Now the actual computation. There are five steps.

Step 1. Compute forward velocity, V

$$V\,(FT/SEC) = 16.4\sqrt{\frac{W}{S}}$$

Step 2. Compute net energy, E

$$E\,(FT\text{-}LBS) = 1.85\,R$$

Step 3. Compute drag factor, D

$$D\,(LBS) = \frac{W}{454\,G}$$

Step 4. Compute cruising distance, C

$$C\,(FT) = \frac{E}{D}$$

Step 5. Compute duration, T

$$T\,(SEC) = \frac{C}{V}$$

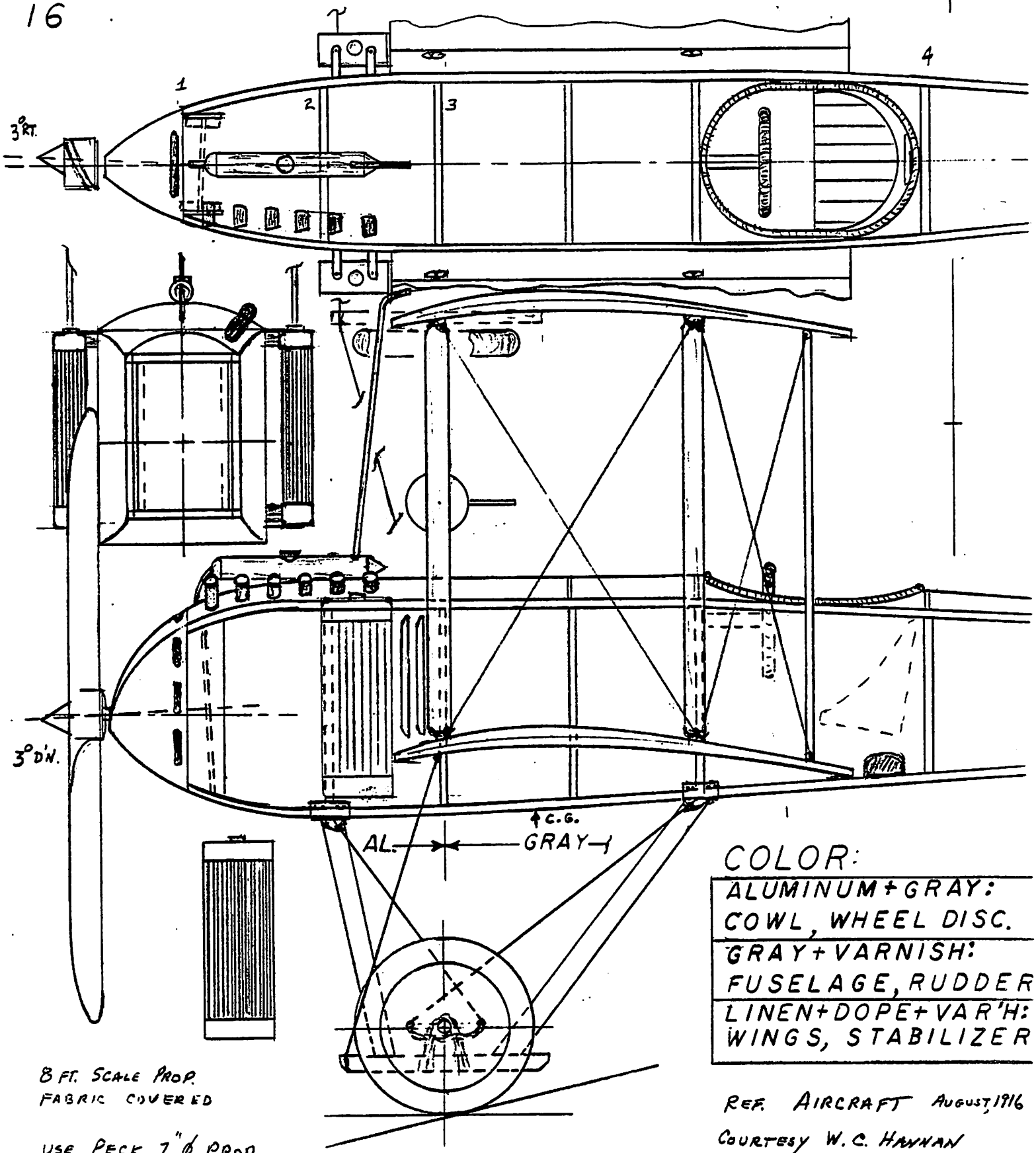
There you have it, disciples! Five easy steps and out comes your duration! Is the process really any good? Will future contests consist of simply turning in your calculations to headquarters?

Fear not...the process does have merit and is accurate to about plus or minus ten seconds. However, there are serious weaknesses in the form of built-in uncertainties concerning prop efficiency and drag estimation. See Federal Case for nitty gritty. Perhaps the best use of this approach is to serve as an early warning if the design is hopeless. If the calculated duration is in the twenty-second ballpark, there's something funny in the soup.

Supplying a sense of how all the design factors interact is another important application of this technique. For example, below is a plot of what happens to a particular clean Jumbo as the wing loading, and only the wing loading, is varied (the solid line). The single circled point represents the performance (dead air) of the real model. In this case the actual performance was better than anticipated--my guess on glide ratio was probably too pessimistic, or maybe the air wasn't as dead as it seemed. But the real value of this exercise is not one of putting the experimental point on the curve, but in obtaining a sense of how wing loading influences the outcome. Build it light or that soup will get you!

How come those Wakefield guys get away with high wing loading? This too comes out of the computations. They have a drag factor that is tiny as compared to the usual Jumbo design and they push the net energy term much higher than we dare by going right up to the bursting point of the motor. In this fashion (see Federal Case) the performance prediction for a typical Wake yields 162 seconds.

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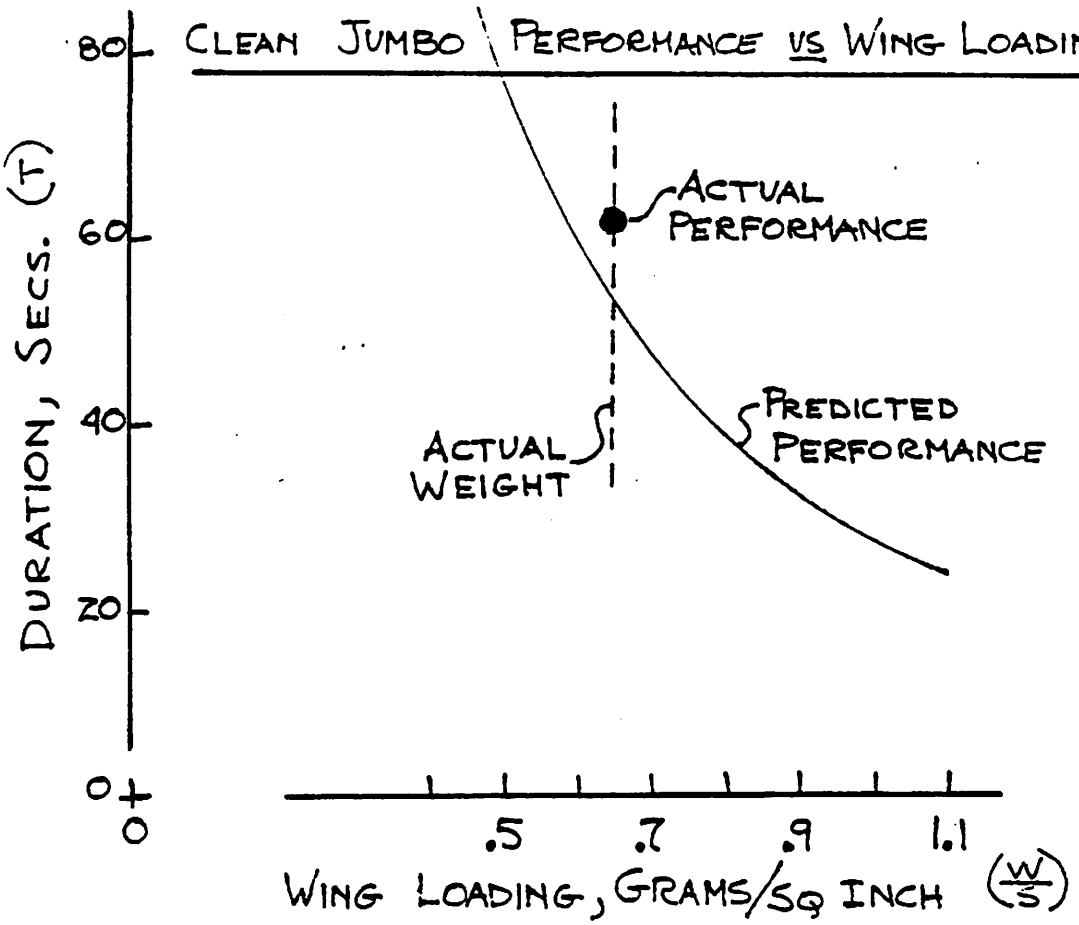


COLOR:
ALUMINUM + GRAY: COWL, WHEEL DISC.
GRAY + VARNISH: FUSELAGE, RUDDER
LINEN + DOPE + VAR'H: WINGS, STABILIZER

8 FT. SCALE PROP.
FABRIC COVERED

USE PECK 7" ϕ PROP
FOR RUBBER POWER.

REF. AIRCRAFT AUGUST, 1916
COURTESY W. C. HANNAN
SEE PECK-POLYMERS BH 115
FOR PEANUT 12" PLAN.



Federal Case

To go beyond typical Jumbo design parameters, it is necessary to manipulate the basic formulas to fit your case. In turn this requires an understanding of the formulas are derived.

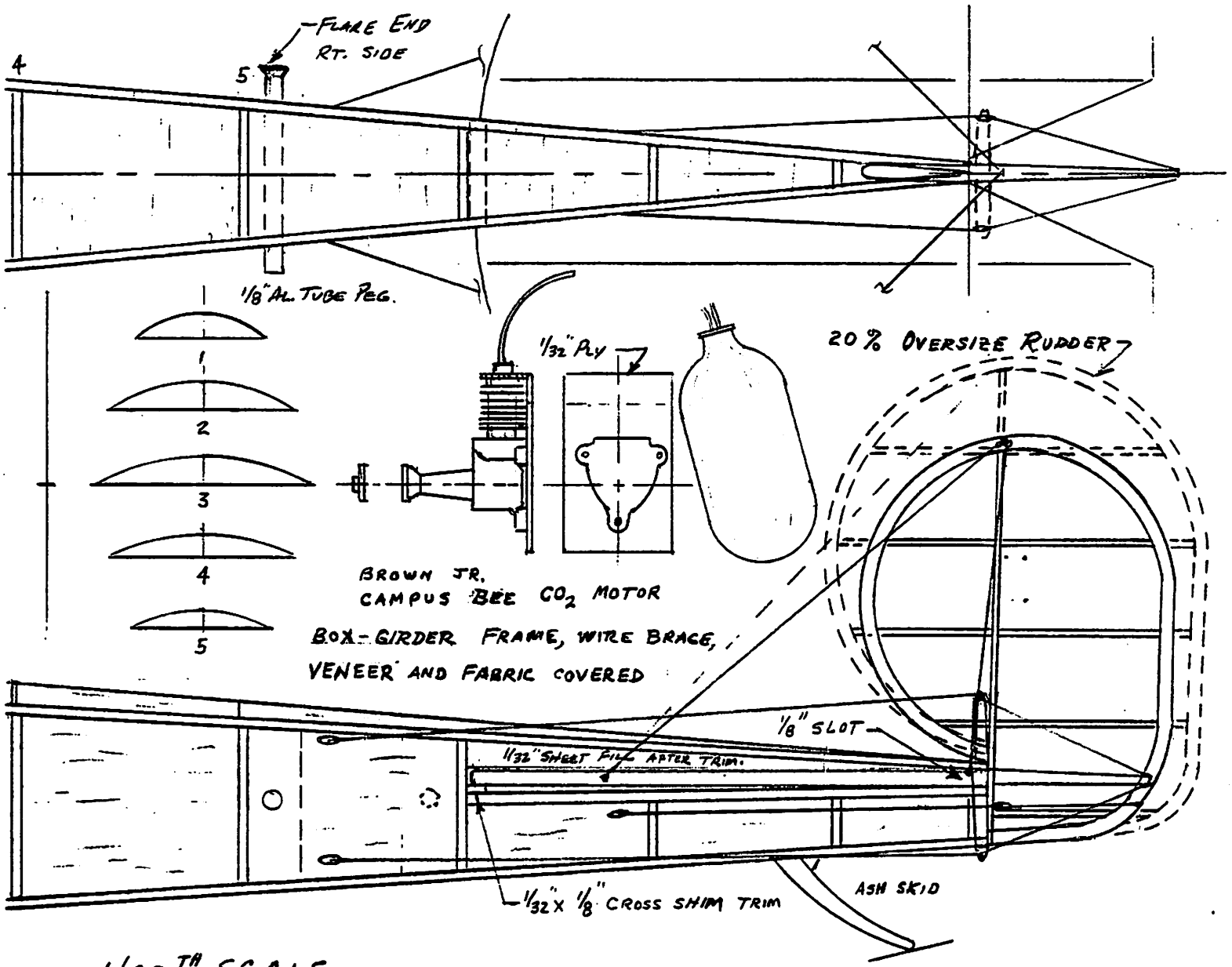
The essential concept employed here is that it makes little difference, in terms of duration, as to whether the flight mode uses lots of climb or lots of cruise or something in between. Proof was offered in the 1975 NFFS Symposium. As the computation process is simpler for the no-climb, all-cruise conditions, we shall employ same exclusively.

Step 1. The forward velocity expression employs the classic formula $V=\sqrt{\frac{2W}{C_L S \rho}}$ where C_L is the lift coefficient and ρ is the mass density of air. We have used $C_L = 1.0$ on the basis that the airfoil is a Clark Y operating at 20% less than $C_{L_{MAX}}$. A $C_{L_{MAX}}$ of 1.25 has been chosen as proper for the Re range greater than 100,000 from data tabulated by A. Zier (Aerodynamics for Model Aircraft; Dodd, Mead, and Co.; 1942). If you are using an airfoil that is either undercambered or has an unusual amount of topside camber (Gottingen) you may wish to plug in a larger value of C_L. Conversely, if you are using a symmetrical airfoil, you should employ a smaller C_L. As for ρ (taken as .0024 slugs per cubic foot) don't fool with ρ unless you fly off Mt. Everest.

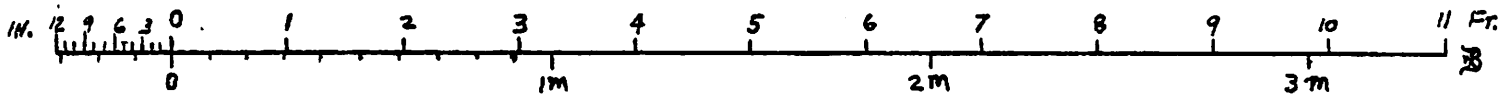
Step 2. The net energy E, is based on rubber possessing 2800 ft-lbs/lb of work capacity wound to 75% max turns and therefore delivering only 60% of its potential energy to a prop that, in turn, is only 50% efficient. A great deal of energy is untapped by not winding to 100% turns and if you have more guts than I you may choose to go all the way. As concerns the prop efficiency, the 50% factor is equal to the lower end of Wakefield effectiveness and that is where we live. If you have reason to believe that your prop differs from the average--either way--modify the net energy term accordingly.

Step 3. The drag factor D is simply the estimated total drag of the model. The reason for working backwards from the anticipated glide ratio is that the process of working forwards is difficult and uncertain. Of all the five steps, this one is the shakiest--and yet, one of the most important. To work forwards,

+ 18



1/20TH SCALE



WRIGHT

MODEL "L" LIGHT SCOUT

70 HP WRIGHT "SIX"

AIRCRAFT

DWN BY Paul J Palmer
1916

CROSSWINDS · 10-83 · 8/8/83 Russ Brown

SH 2

break the total drag coefficient C_{D_T} into the profile drag coefficient C_{D_P}, the induced drag coefficient C_{D_i} and the frictional drag coefficient C_{D_f}

Thus $C_{D_T} = C_{D_P} + C_{D_i} + C_{D_f}$

For values of C_{D_P} we will use wind tunnel results for that assumed Clark Y wing, courtesy of NACA and rule of thumb formulas (Boundary Layer Theory--Schlichting; McGraw Hill, 1960) for fuselage components.

For the wing we will simply accept $C_{D_P} = .06$. Induced drag may be obtained from the classic expression:

$$C_{D_i} = \frac{C_L^2}{\pi (\text{ASPECT RATIO})}$$

Simply plug in your value of C_L and aspect ratio. For a C_L of 1.0 and an aspect ratio of 6 (which suits many Jumbo designs) we have $C_{D_i} = .053$.

To get C_{D_f} we will make use of the Blasius value

$$C_f = \frac{1.328}{\sqrt{RE}}$$

With the Reynolds number in the 100,000 ballpark we have $C_f = .0042$.

If we assume the total wetted area (wing+fuse+tail+etc.) to equal four times the projected wing area, we have

$$C_{D_f} = 4\,C_f = .017 \approx .02$$

For the fuselage we will use the following rule of thumb $C_{D_P} = (.4 \rightarrow .7)\frac{X}{S}$ where X is the maximum crossectional area of the fuselage or strut or spat or whatever. The sliding coefficient in the parenthesis is used to account for the "bluffness" of the body in question. If really blunt, go with 0.7. If streamlined, go with 0.4. If in between, interpolate. In using this rule we are assuming that the airflow separates at the point of maximum crossection, i.e., there is no streamlined flow in proximity to the backside of any object. While seemingly pessimistic, I think this fits the facts of life. As an example, this means that a spatted wheel offers more drag than a bare wheel (bigger cross-section for the spat and no credit for streamlining on the backside).

Let's do a sample drag calculation using the Mister Mulligan (The National Air Racers in 3-Views, 1929-1949; Charles A. Mendenhall; Diane Publishing Co) as a subject. Working from the 3-view, we note that the wing area is 137 ft^2 and compute the maximum fuselage cross-section area to be 22.6 ft^2. There are four main struts and landing gear members that appear to offer about 7ft^2 of crossectional area. Finally there are spats of 4ft^2 area.

For the wing we will simply list C_{D_P} and C_{D_i} values already obtained. Noting that the fuselage entry is blunt we have

Fuse $C_{D_P} = (.7)\,22.6/137 = .115$
Strut $C_{D_P} = (.4)\,7/137 = .02$
Spat $C_{D_P} = (.4)\,4/137 = .01$
Total Fuse $C_{D_P} = .145 \approx .15$

A final summary would consist of

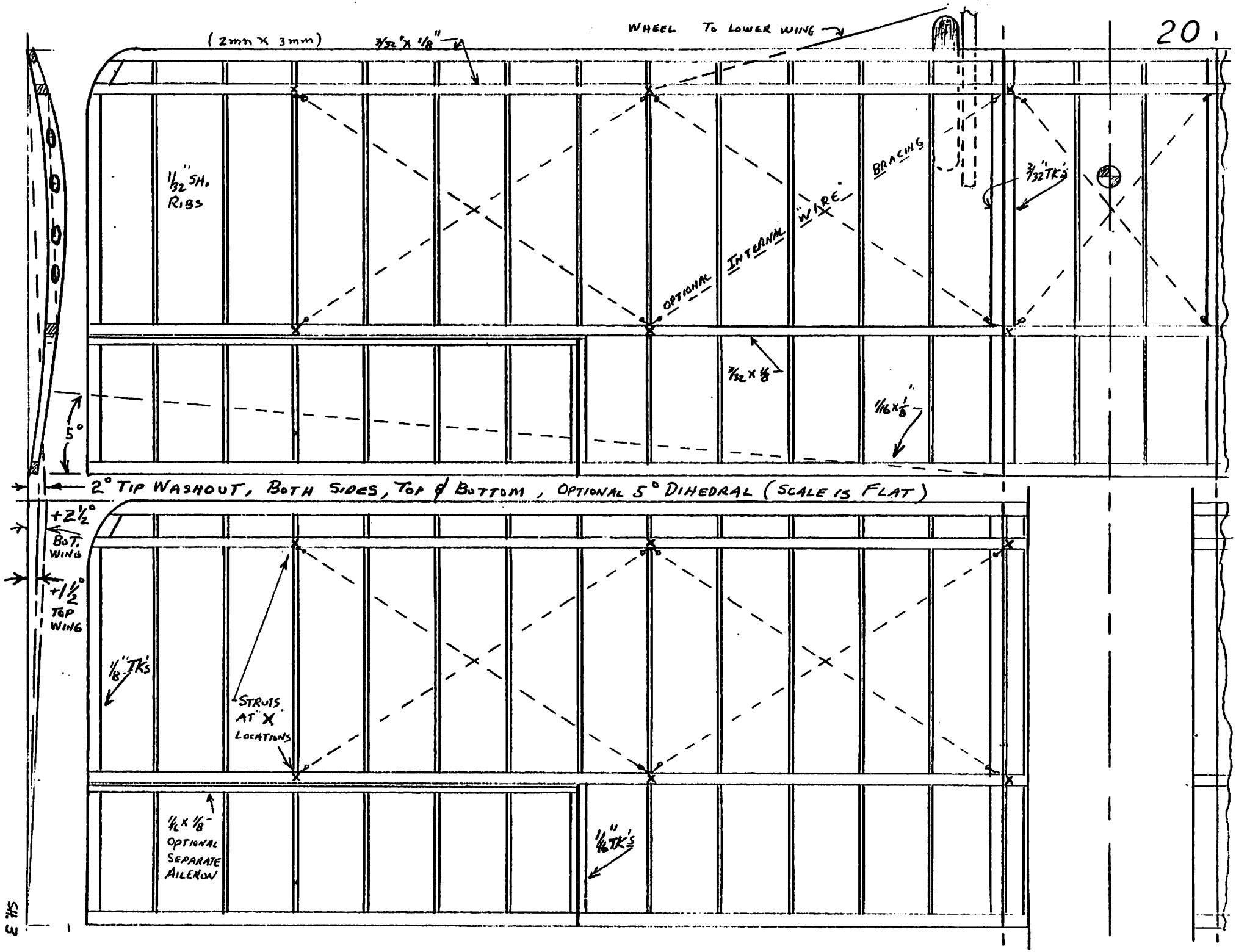
Wing $C_{D_P} = .06$
Wing $C_{D_i} = .05$
Total Fuse $C_{D_P} = .15$
$C_{D_f} = .02$
$C_{D_T} = .28$

As we have taken C_L to be 1.0, the glide ratio is

$$G = C_L / C_{D_T} = 1/.28 = 3.6$$

Perhaps the greatest value in going through this sort of thing is not the final number, which is not really solid, but to be forcibly reminded of how all the numbers add up. If that fuselage was arranged in tandem fashion without all those struts we might hope to knock, say one-third off the total drag value. In turn we would have one-third more duration. Defiant, anyone?

Step 4 and Step 5 are unchanged in the Federal Case procedure from that given in Short Form.


(2mm x 3mm)
3/32" x 1/8"
WHEEL TO LOWER WING
1/32" SH. RIBS
OPTIONAL INTERNAL WIRE BRACING
3/32" TKs
3/32 x 1/8
1/16 x 1/8
5°
2° TIP WASHOUT, BOTH SIDES, TOP & BOTTOM, OPTIONAL 5° DIHEDRAL (SCALE IS FLAT)
+2 1/2° BOT. WING
+1/2° TOP WING
1/8" TKs
STRUTS AT "X" LOCATIONS
1/2 x 1/8 OPTIONAL SEPARATE AILERON
1/16" TKs
SK 3

That's it! You are now in a position (via Federal Case) to determine endurance for far-out configurations!

The following pearls of wisdom may give you a sense of what there is to be learned from this sort of computational effort:

1. Go with the biggest wing and the smallest fuselage cross-section.

2. Go with more rubber weight, especially if it can be employed in the form of a longer motor. While it is true that any additional weight costs something in the way of duration, there is still a huge profit to be gained from more rubber. This is especially true if you are operating down in the 10% region. Yes, too much rubber can be a loser, but we are far from that point.

3. Go with low wing loading. I would draw the line at 0.75 grams per square inch. See Figure. The guy who can build down to 0.5 grams per square inch will win every time.

4. Drag counts heavily. If you can paint on detail, fine. But if the detail consists of lumps, humps, and bumps, go easy.

5. The case for the "retracted" landing gear is a good one. The eliminatiom of even small amounts of weightand drag can be critical if your goals are competitive. (In Jumbo the weight saving is usually more important than the reduction in drag.) Perhaps the decision ultimately rests on the nature of your home field. If strewn with rocks and broken glass, a gears-up downwind landing on a windy day can be memorable. On the other hand, if you really have long grass--...

6. If your problem is one of practical configuration choice, be guided by 1 and 4 above. For example, in WW II the Stormovik is much better than the P-47, and in lightplanes the Piper Cub is superior to the Taylorcraft. The extended wing version of anything is better than the clipped wing version.

7. Seemingly hopeless configurations can be made competitive by (a)superlight construction (b)extended and very powerful motors (c)ignoring detail. Going down this road is clearly dangerous; yet many strange things are done in the name of romance.

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And so we come to the end of this meditation. A means of analyzing the soup before ingestion has been presented. Perhaps your intended is truly loving and a great soup chef as well; in this event calculations are not required. On the other hand, a lifetime of bitter experience has taught me that it is better to do some calculations now than to employ a stomach pump later. Think upon it!

Glue Guru's Golden Groupies

Dave Strutt--Biplane builder of reknown.

Bob Thumbsome--CD known for throwing out contestants who disagree with his rulings

Russ Braun--Despite claims, unrelated to Rommel, the grey fox. Instead believed undeclared son of Eva Braun and a certain historical figure.

Press Pruning--Designer of tiny plans, suited for publication in minimal space.

Early Stall--Pioneer rubber scale designer. Did not believe in downthrust.

Sydney Strudle--30's developer of multi-layered construction.

Mike Midcalf--Short pants WW II buff.

Don Skole--Designer of Heinekin fighter.

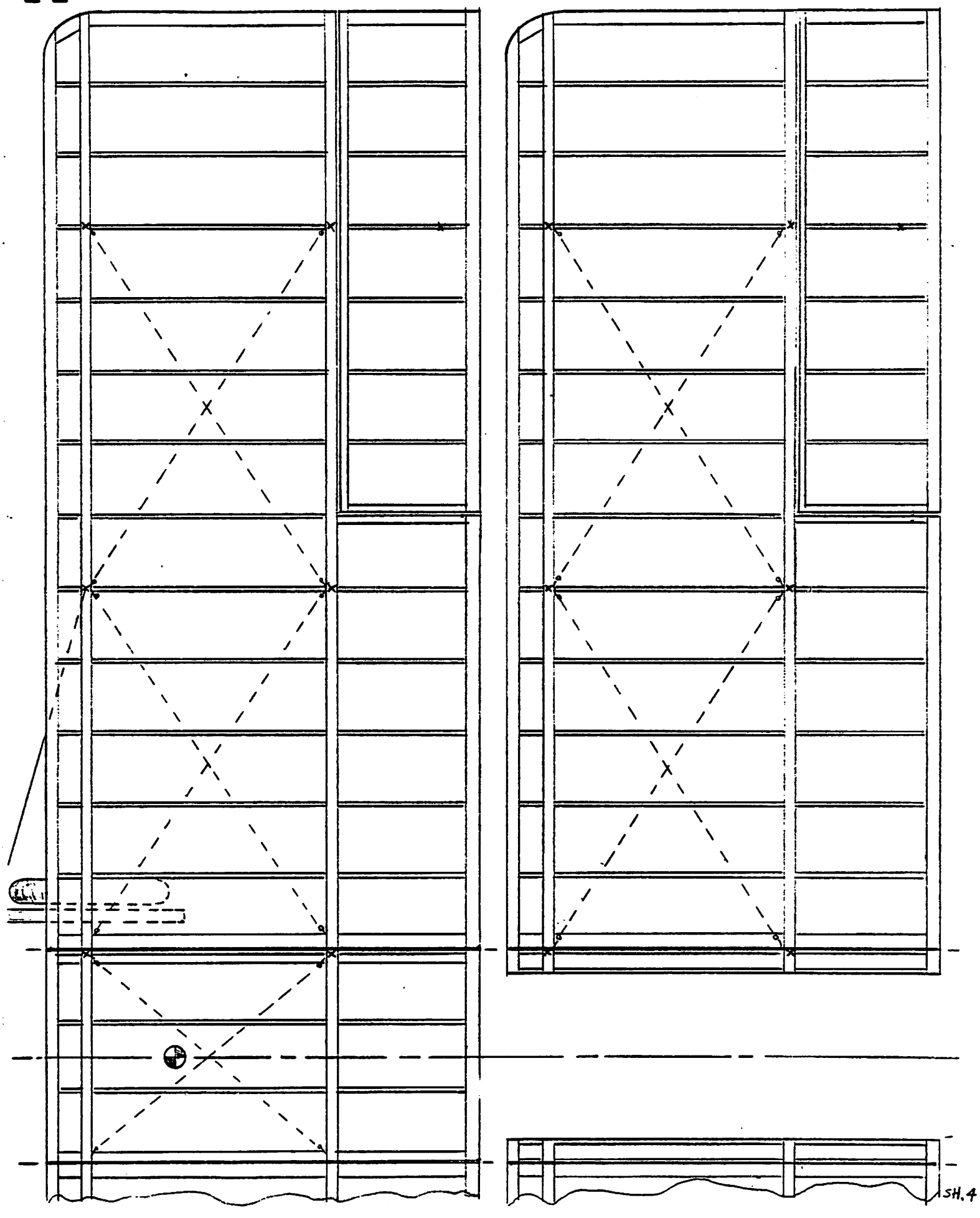
Gordon Romeo--Indefatigable pursuer of Defiant Chambermaids.

George Goring (aka Meyer)--Name change rumored after Berlin was bombed.

Dick and Leon Benttab--One draws, one calculates; neither wins much. Genuine Wrong Brothers.

Prof Ted Langley--Still trying to make the aerodrome fly. Has learned something-tends to avoid the Potomac.

Dennis Borman--Nerveless 109 pilot;not easy when on the run from Israel's Massad.


SH. 4

OPTIONAL SCRAPS EVENT ENTRY

9" WINGSPAN INCLUDING DIHEDRAL

DELETE FOR 9" VERSION

RAISE 1/8"

~~A-6 EVENT~~
~~30 IN² MAX. WING AREA~~
~~6 IN MAX. PROP DIA.~~
~~6 IN MAX MOTOR STICK~~
~~1/16" MIN. STRIP SIZE~~
~~1/32 MIN. SHEET SIZE~~
~~NO SPECIAL INDOOR MATERIALS~~
~~PROP - FLAT SHEET OR~~
~~UNLIGHTENED PLASTIC~~
~~1/32 X 1/16 RIB MIN.~~
~~1/32 MIN SHAFT~~
~~TISSUE COVERING~~ OR CONDENSER PAPER
RUBBER POWER

3/4" TIP DIHEDRAL

DELETE FOR 9" VERSION

NOTE: ALLOW APPROX. 010"/INCH REDUCTION IN PRINTING.

PROP TOP VIEW

1/32" PROP BLADES

5 3/4"

5/8"

BALANCE

3/4" SLIGHT DOWN + LEFT THRUST

1/8" X 3/16"

OFFSET BOOM ~1/4" FOR LEFT TURN

POWER - 12" LOOP OF .040-.060

1/32" SHAFT
1/16" AL. TUBE
1/8" HUB

1/64" BIKE FRI... FIT TO STICK

WING MOUNT

A-6 Model
COURTESY
C Mather
San Diego Orbiteers

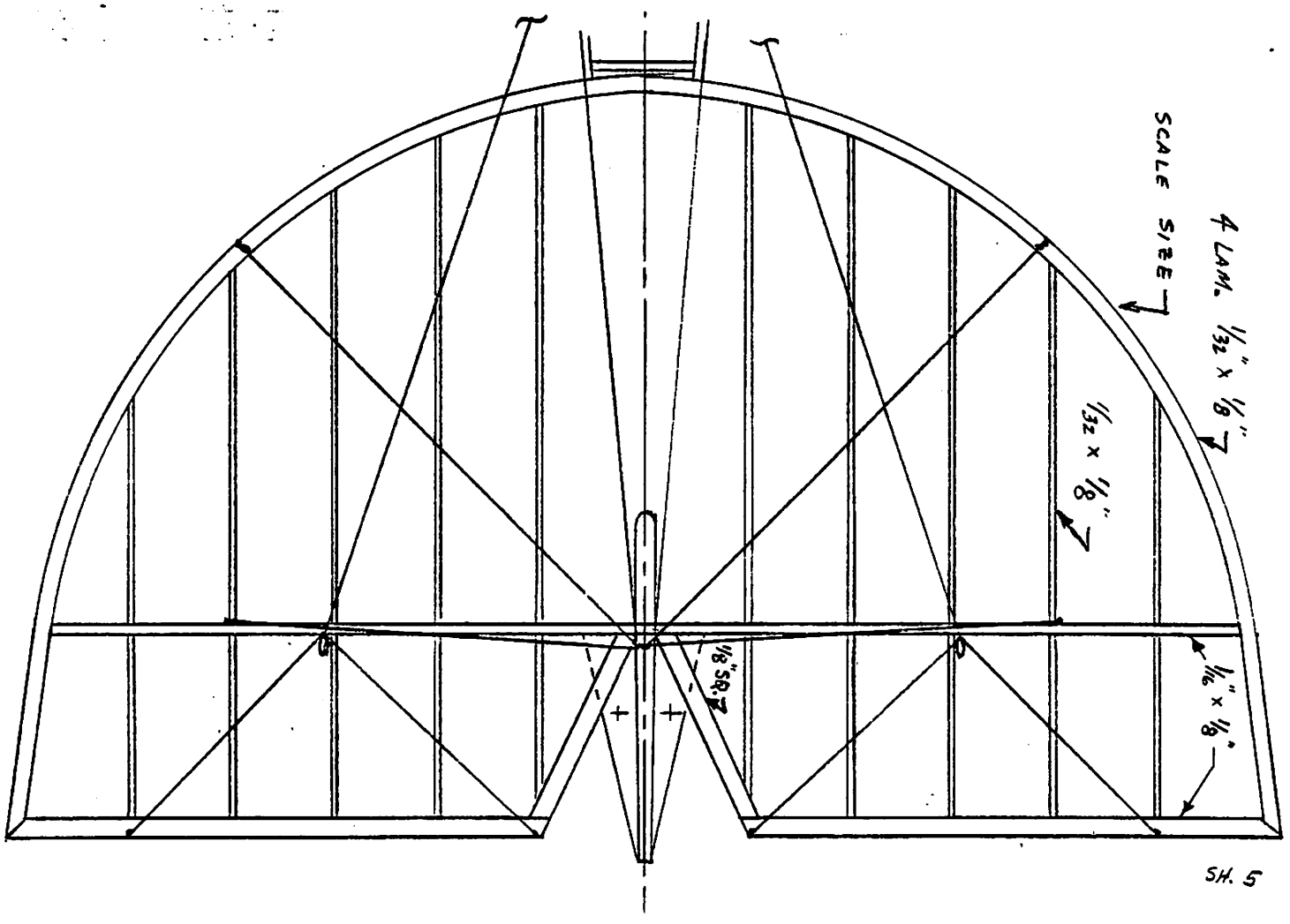
24

AIRCRAFT DATA SHEET.

Section "G" Aeroplane Design.

SPECIFICATIONS: Wright Light Scout Tractor Biplane.

TYPE: Light Scout.
MODEL: "L."
SEATING CAPACITY: One.
SPAN, top plane: 29 ft. 6 in.
SPAN, bottom plane: 29 ft. 6 in.
LENGTH, over all: 24 ft. 0 in.
HEIGHT, over all: 10 ft. 9 in.
MAIN PLANES, Chord top: 6 ft. 0 in.
MAIN PLANES, Chord bottom: 6 ft. 0 in.
MAIN PLANES, Section: Own.
MAIN PLANES, Angle Incidence: 5°.
MAIN PLANES, Back Sweep: None.
MAIN PLANES, Dihedral Angle: None.
MAIN PLANES, Gap between: 5 ft. 9 in.
MAIN PLANES, Stagger: None.
BODY, Length: 21 ft. 4 in.
BODY, Width: 2 ft. 6 in.
BODY, Depth: 2 ft. 9 in.
HULL, Type:
HULL, Length:
HULL, Depth:
HULL, Steps.
PONTOONS, Number of:
PONTOONS, Length of:
PONTOONS, Beam:
PONTOONS, Depth:
PONTOONS, Steps:
LANDING GEAR, Type: 2 wheel.
LANDING GEAR, Wheel size: 26 ft. x 4 in.
LANDING GEAR, Wheel tread: 4 ft. 9 in.
LANDING GEAR, Shock absorber: Wright rubber.
TAIL SKID, Type: Enc. spring-swvl.
AREA, Main planes: 334 sq. ft.
AREA, Rudder: Bal. 12 sq. ft.
AREA, Elevators: Split—22 sq. ft.
AREA, Vert. Stab. Fin:
AREA, Stabilizer: 47.5 sq. ft.
AREA, Aileron-total: 28 sq. ft.
STABILIZER, Type: Adj. semi-circ.
AILERONS, Number of: Two.
AILERONS, Operation of: Conjunction.
CONTROL System: Wright.
CONTROL, Number of: One.
SIGNAL System:
WEIGHT, Empty: 850 lbs.
WEIGHT, Loaded: 1,500 lbs.
WEIGHT, Per sq. ft.: 4.5 lbs.
SPEED, light, Max. and Min.:
SPEED, loaded, Max. and Min.: 81-25 m.p. hour.
RANGE OF ACTION: 2 hours.
CLIMBING SPEED: 650 ft. min.
GLIDING ANGLE:
MOTORS, Make of: Wright.
MOTORS, Number of: One.
MOTORS, Type of: 6 cy. vert. w. c.
MOTORS, Horsepower total: 70.
MOTORS, Revs. Per Min.: 1,400.
PROPELLERS, No. and Type: 1—2 bladed.
PROPELLERS, Diameter of: 8 ft. 0 in.
PROPELLERS, Drive: Wright flexbl.
PROPELLERS, Drive Ratio: 1:1.
GASOLINE, System of feed: Pressure.
GASOLINE, Tank location: Frnt. pilot.
GASOLINE, Capacity: 12 gals.
RADIATORS, No. and Type: 2—Wright tubir.
EQUIPMENT, Special: Ang. incdnc. indctr.



SH. 5

**********BYTE SIZE**********

Mumbo Jumbo #6 from the Glue Guru by Leon Bennett

Salutations disciples! Today we shall meditate on the choice of model size within the Jumbo range. How big shall one's intended be? This is not an arbitrary decision; for in this valley of tears, a disadvantage accompanies every advantage. As it is written, he who has two penises makes much water.

To sort out the various considerations, let us divide all Jumbos into three size categories, of say 1, 1 1/2 and 2 inch scale, where 1 inch represents the smallest or entry level size, and 2 inch represents the extreme boundary of what can be flown today. At 1 inch scale, the typical light plane or WWII fighter will span roughly 3 ft.; at 1 1/2 inch, roughly 4 1/2 ft.; at 2 inch, roughly 6 ft. Now let's assume that we've built all three versions of the same configuration. How would they differ?

Performance

There are two types of performance to consider - flight realism or that which satisfies the soul and, quite separately, flight time or that which wins contests. Flight reality improves steadily with increasing size and weight. At 1 inch, erratic movements in the air and silly landings are the rule. At 2 inch, the smoothness of flight is impressive and the landing gear will actually rumble as the great bird settles in.

Flight time is largely independent of size. Current "good" Jumbo performance is about one minute, dead air, at any of the listed scale ratios. Now this seems odd, for aerodynamics improves as size increases and we might expect the larger Jumbos to do better. In practice, the difficulties of handling heavy motors tends to result in underpowered models as size increases. A second factor reducing performance in the bigger model is the inherent tendency for structural weight to increase faster than wing area. In other words, the big ones tend to have a higher wing loading than the small ones. The combination of insufficient rubber and extra wing loading exhibited by the big ones just about offsets the gain in aerodynamics, resulting in essentially constant flight time right across the board.

Cost

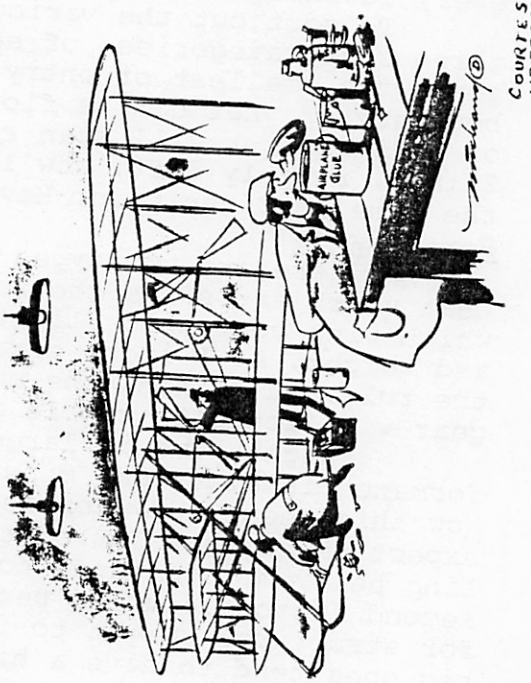
Assuming that you are hewing your own timbers from Sig Contest Grade stock, the material cost exclusive of glue, will run about $5 for 1 inch, $10 for 1 1/2 inch and $20 for 2 inch. A motor will cost about $1 for 1 inch, $2 for 1 1/2 inch and $3 for 2 inch. Glue cost, while insignificant if you use white glue for 1 inch, can become considerable if you use instant glue for 2 inch and tend to work in a stop and go fashion. I've just been through $12 worth of instant glue in connection with a single Jumbo. Regretably, much of it died in the bottle.

Rubber

You can anticipate using 6 to 10 strands of 1/4 Sig for 1 inch, 10-16 for 1 1/2 inch and 16-24 for 2 inch. Now there's a catch here, for the average man, equipped with a typical converted drill type winder, will find it difficult to cope with more than 14 strands. The cheap winder's plain sleeve bearings and crudely fashioned gears require a high level of torque simply to overcome internal friction. If you intend doing something serious at the 1 1/2 to 2 inch level it will be best to purchase or make a ball bearing winder of the type used by the Wake and Unlimited crowd. If you are reluctant to acquire a special winder, choose a scale that will limit the prop diameter to about 16 inches. Something like 12 strands will then do the job, and 12 strands are readily handled by standard winders.

Loading Gear

At the 1 inch end of the size range, a landing gear is optional, at 1 1/2 inch a landing gear is a very good idea and at 2 inch a trike configuration is worth serious thought. While the landing speed of all these models should be roughly the same (regulated by the maximum allowable wing loading of 0.75 grams /sq.inch) the larger models will have much more momentum and kinetic energy to dissipate in the landing process. This is particularly



COURTESY AIR PROGRESS/88

SH. 6

evident on a windy day. Given a downwind landing, the 2 inch model can experience a landing run on bare ground of 25 feet or more. Should it meet with a pothole or muddy spot, a nose over accompanied by prop damage is likely. Again, the trike is worth thinking about in large Jumbo - maybe these RC people know something, after all.

To reduce the nose over possibility, it is useful to move the main wheels forward on a tail dragger. About one inch of forward displacement will help enormously. The trick is to get as much forward motion as possible without offending the eye.

Obviously the nature of your home field must be taken into account in connection with the landing gear decision and model size is but one consideration.

Portability

The 1 inch can be assembled and glued into one piece and still go easily into any car. The 1 1/2 inch is best designed with a removable wing. The 2 inch will probably require further disassembly (wing into halves, removable tail, etc.) as a function of your car size.

Discussion and Summary

In general, the smaller model emerges as the most practical. The large Jumbo has only one strong plus - a more realistic flight mode. Partial support for this view has been given by the father of us all - Earl Stahl.(Air Trails Classic Flying Models. Vol 2, No 1, Spring 1978) Earl notes, "...a flying scale model having a wing span of 28 to 40 inches with an area of 125 to 175 sq.in. is best. A ship of this size is adaptable to strong realistic construction and at the same time it is large enough to employ an efficient wing section and effective propeller. Unlike the mammoth scale [models] of near-gas-model proportions, these medium size models are easily handled when winding and flying".

From the strictly practical point of view, Earl is right. Still, something has been left out. After all, if we were overly concerned with the practical, we wouldn't be flying toy airplanes.

No, we are engaged in this hobby for reasons having nothing to do with the practical and a great deal to do with romance and fantasy. Thus practical advice, no matter how sound, has its limits. Is it really useful to direct mountain climbers to stay with sand dunes, thereby reducing costs and possible injuries? I think not.

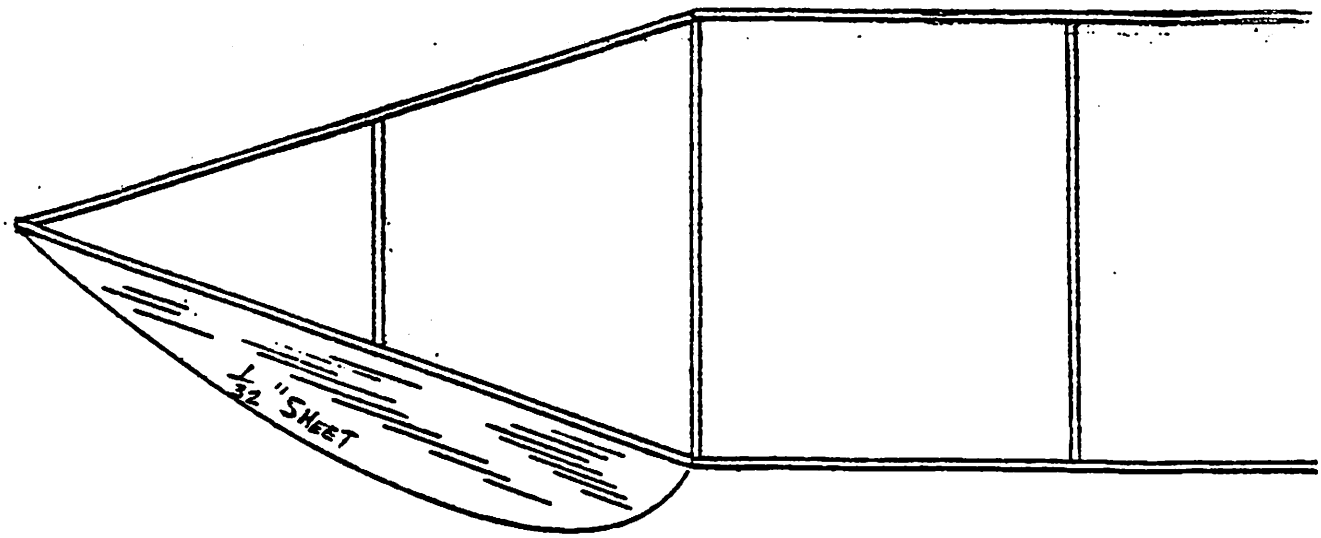
Consider the giant (2") model. Fragile of wing, cumbersome in transport, drooling lube from endless strands of rubber - in all, a hopelessly impractical beast. Yet once aloft, the monster becomes an airplane. In final descent, the already flat glide becomes still flatter as ground effect comes in. Touching the grass, those huge wheels trundle on for many yards as the momentum is slowly paid off. Finally the plane stops, with the prop ticking over in the breeze -

Giant Jumbo, anyone?

****

The revealed truths concerning performance prediction (Glue Guru #5) have been seized upon by the Glue Guruess, a well known computer buff. For other followers of the flickering lights, she offers a complete program (for the VIC-20) that will not only predict performance for given values of G (glide ratio), W (total weight including rubber, in grams), S (wing area, sq. in.) and R (rubber weight, grams), but will automatically offer a cascade of flight times as a function of steps in R. To those of you who prefer enlightment in electronic form, put aside those stupid TV games and reflect upon the following; for buried within is the secret formula for winning any contest!

```
MODEL AIRPLANE FORMULA
10  PRINT "CLR HOME"
20  FOR I=1 TO 6
30  PRINT
40  NEXT I
50  PRINT "MODEL AIRPLANE FORMULA"
60  PRINT "**********************"
```



R.O.G.

CONTEST RULES:

* (1) BUILD PER PLAN WITH NO STRUCTURAL CHANGES
(2) ANY PLASTIC PROP UP TO 5½" DIA.
(3) PROP MAY BE ALTERED BY SANDING THIN ONLY
(4) USE TISSUE COVERING. NO C-PAPER, MIC. OR MYLECLITE. KIT R-1 and cement
(5) MODEL MUST RISE OFF GROUND.
(6) UNLIMITED ATTEMPTS FOR 5 OFFICIAL FLIGHTS.
(7) BEST FLIGHT IS SCORE.
(8) AN ATTEMPT IS A R.O.G.
(9) ANY PROP HANGER AND BEARING MAY BE USED.
* (10) CENTER SECTION OF WING MAY BE FLAT
(11) MINIMUM WEIGHT OF MODEL = 3.5 GRAMS WITHOUT RUBBER
(12) NO CAMBER TO WING

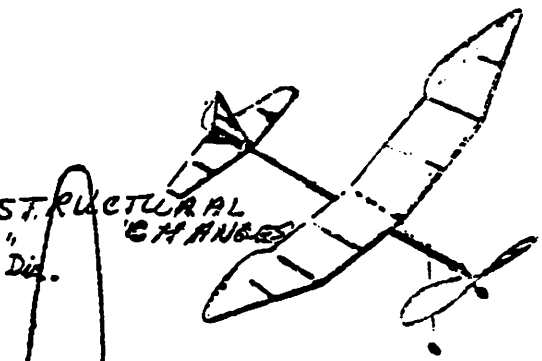
Bend prop shaft as shown

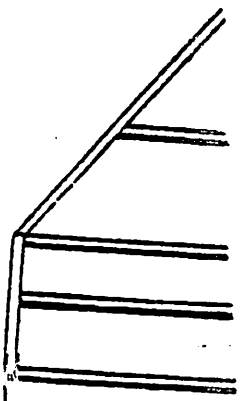
GEAR SHAPE

Jetco MODELS

© A. ZAIC CO. INC. BROOKLYN 21, N.Y.

COURTESY CARL ZAIC





Power 7¤ loop of 1/8" flat rubber.—OPTIONAL

```
 70  FOR Z = 1 TO 1000: NEXT Z
 80  PRINT " CLR HOME"
 90  INPUT "MODEL";M$
 95  PRINT
 96  PRINT
100  INPUT"G";G
110  INPUT"W";W
120  INPUT"S";S
130  PRINT
140  INPUT "LOWEST R=L"
150  L=7*W/100
160  INPUT "HIGHEST R=H"
170  H=W/3
180  PRINT
190  INPUT"WHAT STEP FOR R";P
200  PRINT
210  DEF FNT(R)=51.15*R*G/(W*SQR(W/S))
220  PRINT
230  PRINT TAB(2);"R";TAB(11);"T"
240  PRINT "----------------------"
250  FOR R=L TO H STEP P: PRINT R;TAB(10);INT(FNT(R))
260  NEXT R
270  INPUT "MORE(Y/N)";A$: IF A$ = "Y" GOTO 80
280  END
     RUN
```

(Note: The maximum reasonable range for R relative to W is R=7% W to R=W/3)

The above program will result in the following SCREEN DISPLAY:(▒ is cursor)

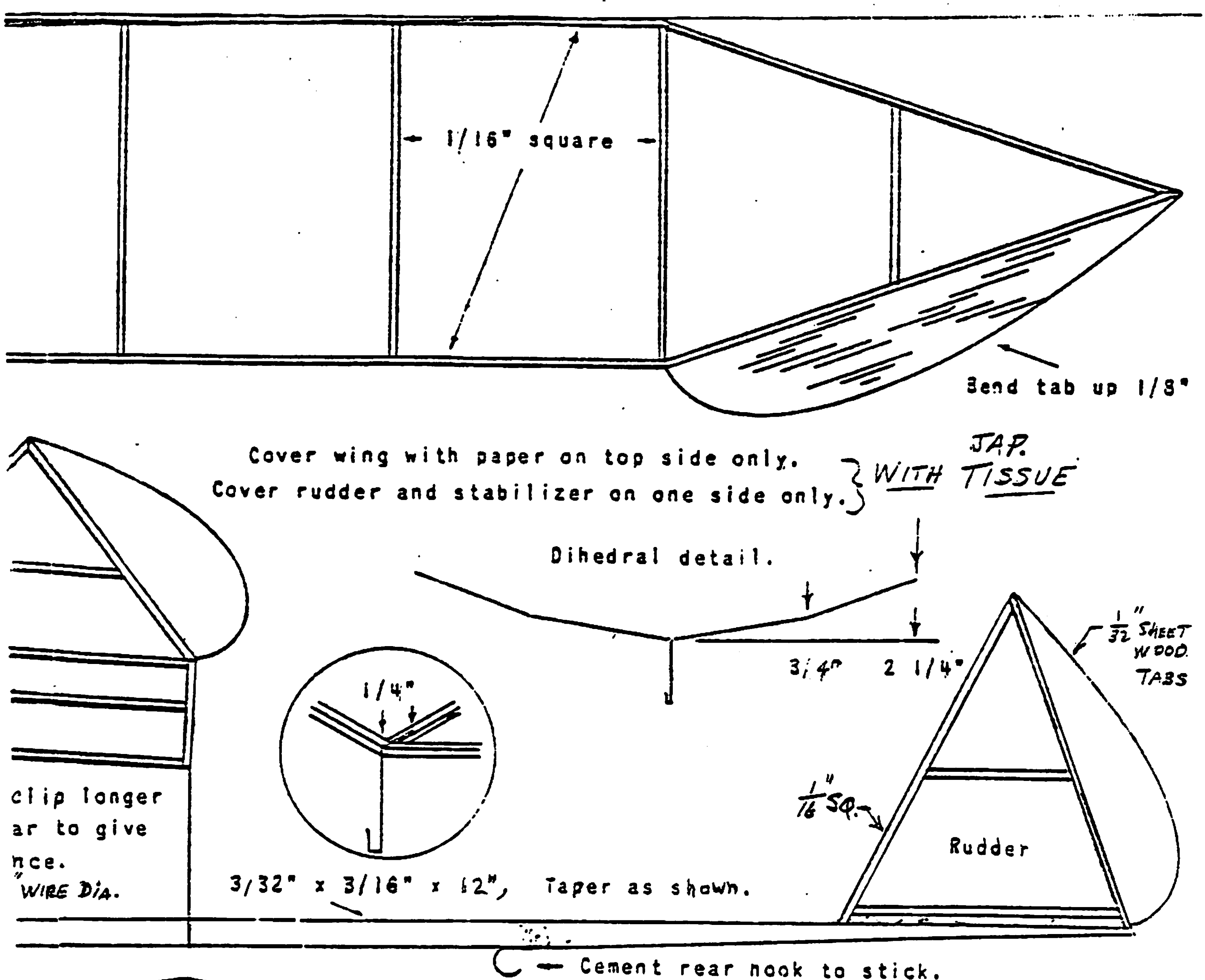
```
MODEL AIRPLANE FORMULA
**********************
MODEL? ▒                        (type in name)
G? ▒                            (type in value)
W? ▒                            ( "        "  )
S? ▒                            ( "        "  )

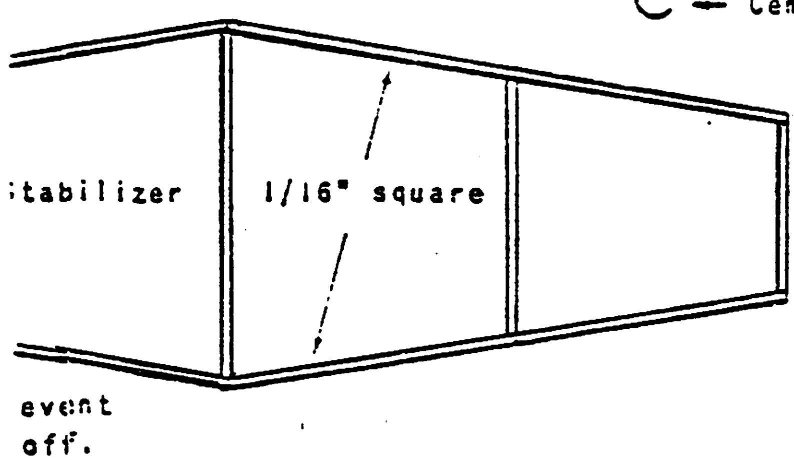
LOWEST R= L
HIGHEST R = H
WHAT STEP FOR R? ▒              (type in desired step -or increment- for R)
 R        T
**********************
---       --                    (scroll will appear on screen giving various
---       --                     R and corresponding T values)


MORE(Y/N)? ▒                    (if you type in Y program will return to line
                                 80 to clear the screen and proceed through a
                                 a possible new set of G,W,S and corresponding
                                 R and T values)
                                (if you type in N program will end)
```

Glue Guru Gnomics

There was a lady Dornier modeler, who took no sass
From rubber scale CD's,no matter how crass
When crossed by Thompson
She decked him with a sponson
And proceeded to shove all 12 props up his mass





[illegible]

TAIL CONSTRUCTION-- Construct the stabilizer and rudder [illegible] with paper. Glue the stabilizer [illegible] the stabilizer.

WIRE PARTS-- The wire parts [illegible] to be true. Notice how the [illegible] sure to scrape away the paper first [illegible]

FLYING-- Move the wing back or forward [illegible] The model should balance about [illegible] wing. To make very small [illegible] For example, to turn left, the rudder tab is bent left [illegible] tab is bent up and the left tab down. [illegible] trial. It may be necessary to move the wing [illegible] is bent.

The paper on this model must not be [illegible] nitrate dope. Otherwise the wing or tail will warp [illegible] shape and the model will not fly. Cover wing and stabilizer on [illegible]

Stability of the model will [illegible] the propeller is bent slightly back, so that the [illegible] points downward

The model may be flown outdoors in calm weather

1983 CALENDAR

Sun Aug. 28 Cloudbusters 16th Annual FFS Meet at Southfield, MI 11 Mile and Franklin Rd. Southfield, MI. 10AM- 4PM.
1) Gas Scale per Book. Hand Launch. 2) FAC Rubber Scale
3) FAC Peanut Scale 4) Embryo Endurance 5) WW II Mass Launch
CD: Ralph Kuenz 1465 Stahelin. Detroit, MI 48223/313-835-7141

Sun Sept 11 Canton, OH FF Scale Contest 10 AM- 4PM Rt. 62 & Rt. 43, 25th ST.
1) P-Nut FAC, plus 3 flight total, & 5 for R.O.G.
2) FAC Rubber Scale, plus 5 for Racers & for R.O.G.
3) Catapult Jet Scale 4) Golden Age Mass Launch Elimination
5) WW II at 1 PM. 6) Shell Dash, 3 flights.
7) Thompson Trophy 8) Greve Trophy at 3 PM. CD Don Assel 454-4308

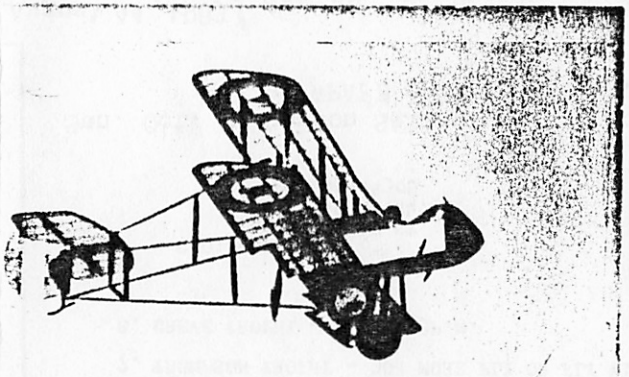
Sun Sept 18 CFFS Greater Storkville Fall FAC at Lorain County Community Col. 10AM- 5PM. I-90 Exit 148 Avon Sheffield to LCCC
1) Peanut G.H.Q. Factor 2) FAC Rubber Scale
3) FAC Power Scale CO_2 or Electric (No Gas at L.C.C.C.)
4) No. Cal. Profile Scale or 3/4" Schneider Cup Profile
5) Embryo Endurance 6) Cleveland Post War Handicap 3 flights
7) Greve Inline Race Mass Launch 8) Thompson Trophy Radial Race
9) WW I Biplane Dogfight 10) WW II FAC Combat Mass Launch.
CD: Dave Pishnery 29323 Grand Blvd. Wickliffe, OH 44092 943-2640
11) Hand Launch Glider (J)(SO)

Sun Sept 25 Annual Fall GHQ meet at Prangmore Painsylvania Rt. 832 N of I-90

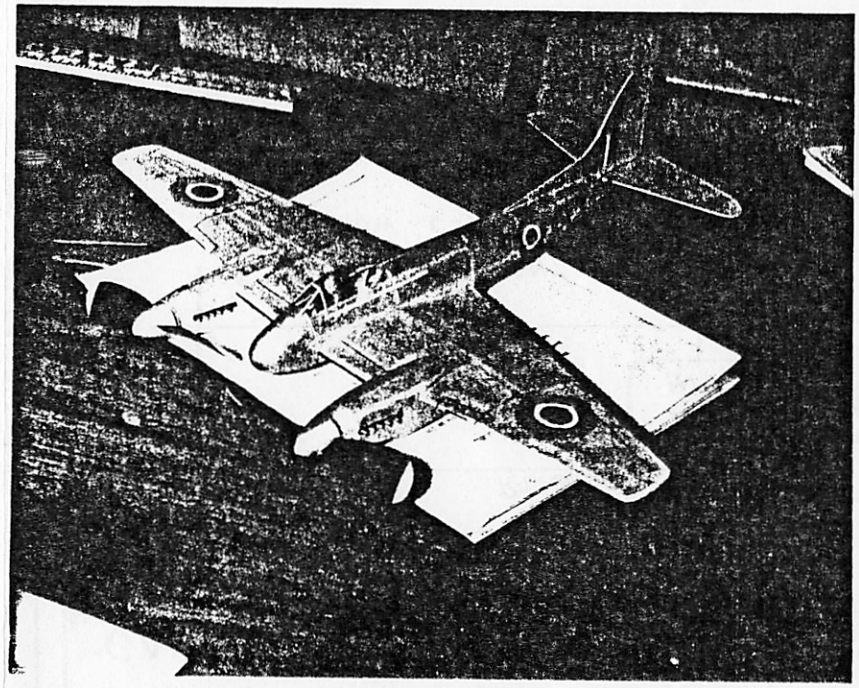
Sat Sept 10 D.C. Maxecuters '83 Summer Fun Fly 9-6pm. All FAC Events. Allan Schanzle, 8311 Exodus Dr. Gaithersburg, Md. 20879

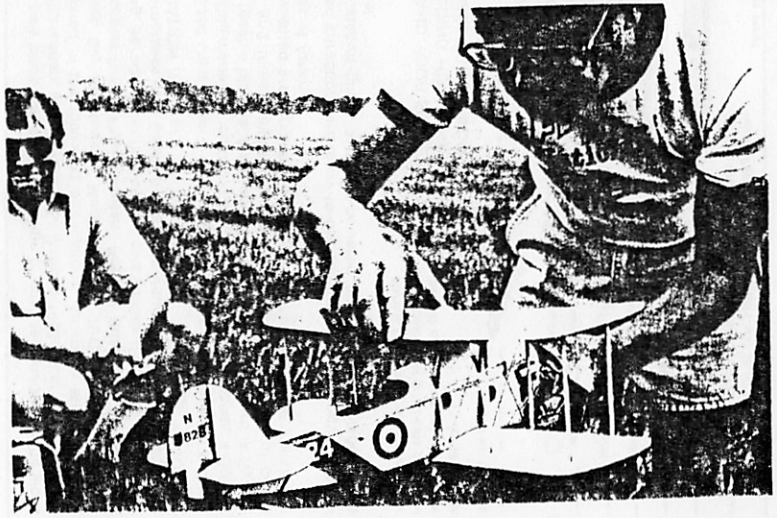
Sun.Sept 11 Utica Michigan at FORD Test Track 9-5 on Van Dyke N of 22 Mile Rd. Free Flight, Etc. includes FAC event Embryo Endurance. CD: 'SOX $2/

9/28-10/4 Worlds Champs at Goulburn Australia



WW I de Havilland dH 2 struts high in Czech Sector for Ace Alfery. Photo Lubomir Koutny. dH evolution to post WW II below is silver Sea Hornet by FAC Capt. Jack McGillivray. Counter props hold up wing at CFFS Estabrook. M. Zand photo.





Struttin' pretty is FAC fearless leader Marshal Dave Stott with Blackburn-Blackburn II all cranked up on flight to trophy row at '83 Nat's. Wings, struts, and wires wonder is scaled from Hurst Bowers MAX FAX plan. Photo Tom Schmitt.

1983 CALENDAR

Sat Sept 24 Dayton WPAFB practice FF date. Enter Gate 19B, Seatbelts ON! See Rules.

Sun Sept 25 CIA FF at WPAFB 9-5pm Flier: Harry Murphy 3824 Oakwood Blvd. Anderson, In. zip 46011. Phone 317-642-7377. October date in works may have FAC events.

SCRAPBOOK of SCALE
3-Views & Nostalgia

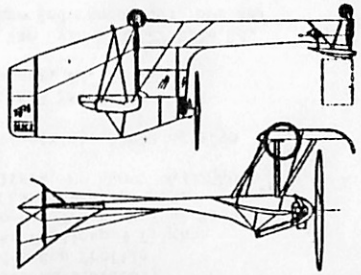
by BILL HANNAN

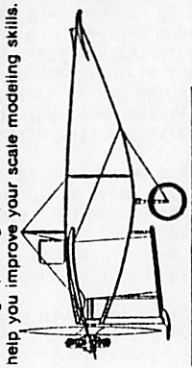
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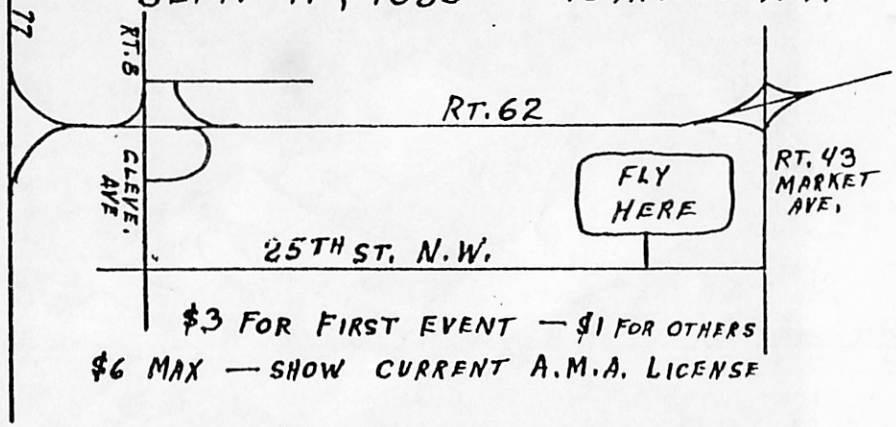
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Sun. Oct. 9 Dayton Salient FAC FF Contest, Frank Scott CD at WPAFB or Twin Towers. 513-890-5989

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