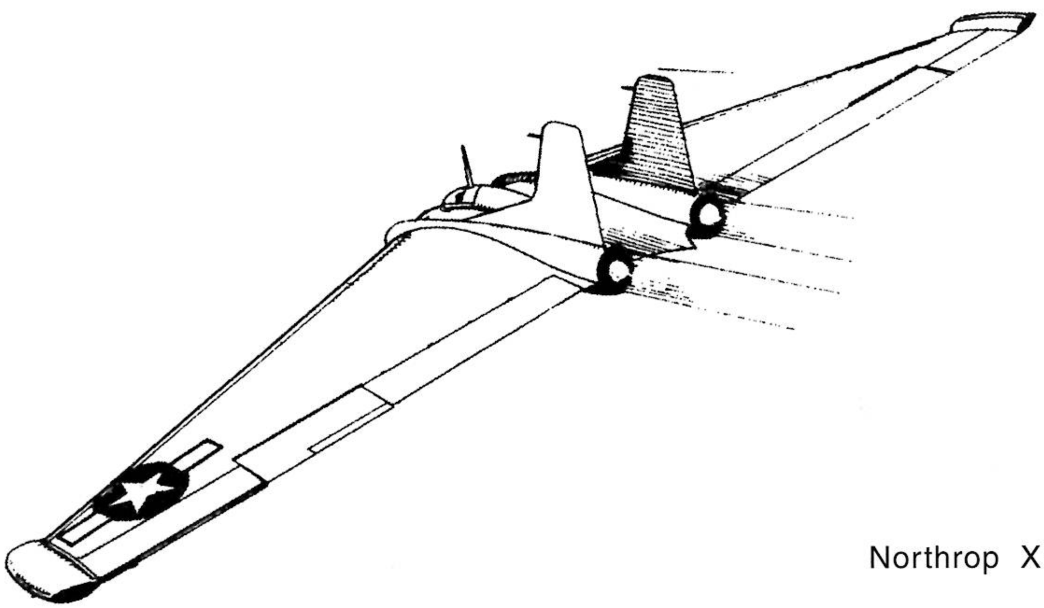
MAX FAX

Journal of the D. C. Maxecuters

... home of the dreaded POTOMAC PURSUIT SQUADRON of the Flying Aces

Editor: Stew Meyers **SEPT/OCT 2003**

AN ISSUE DEDICATED TO FLYING WING AIRCRAFT



Northrop XP-79

COMING ATTRACTIONS

SEPTEMBER 27,28 2003	BRAINBUSTERS FALL CONTEST AT DINWIDDIE AIRPORT PETERSBURG VIRGINIA - FAC EVENTS ON SATURDAY -- SEE FLYER THIS ISSUE
OCTOBER 18,19, 2003	FAC FALL FLING and SKYSCRAPERS ANNUAL at WAWAYANDA, NEW YORK CALL TOM HALLMAN 610-395-5656 OR JOHN HOUCK 610-488-6235 FOR DETAILS
NOVEMBER 1,2, 2003	CAAMA CONTEST BYRD FIELD - CHECK WITH JIM COFFIN FOR INFO - SAML63@aol.com
NOVEMBER 9, 2003	NATIONAL BUILDING MUSEUM FLYING SUNDAY 10AM -4PM - SEE EVENT SCHEDULE THIS ISSUE --- INFO -- DAN DRISCOLL --EMAIL -- djdriscoll@cox.net
DECEMBER 7, 2003 paularch@starpower.net	MAXECUTER BANQUET -- INFO -- PAUL SPREIREGEN -- 202-337-2887 - EMAIL --
DECEMBER 14, 2003	A WRIGHT FLYER FUNFLY AT COMSAT SUNDAY AFTERNOON 3 - 6 PM PLEASE PARK ON ROAD BY POST OFFICE (SEE PAGE 24 FOR INFO)
JANUARY 10, 2004	NBM DELTA DART SESSION for JUNIOR GIRL SCOUTS SATURDAY 10AM TO 1 PM
JANUARY 10, 2004	NBM DELTA DART SESSION for CUB SCOUT WEBELOS SATURDAY 2PM TO 5 PM

VOLUNTEER INSTRUCTORS WARMLY WELCOMED FOR THESE AND ALL DELTA DART SESSIONS

JANUARY 18, 2004	NATIONAL BUILDING MUSEUM FLYING SUNDAY 10AM - 5 PM (Martin Luther King, Jr. weekend)
FEBRUARY 28, 2004	NBM FAMILY DELTA DART SESSION (8 YEARS AND OLDER) SAT 10 AM TO 1 PM
FEBRUARY 28, 2004	NBM DELTA DART SESSION for CUB SCOUT WEBELOS SATURDAY 2PM TO 5 PM
MARCH 7, 2004	NATIONAL BUILDING MUSEUM FLYING SUNDAY 10AM - 4PM
MARCH 20, 2004	NBM DELTA DART SESSION for JUNIOR GIRL SCOUTS SATURDAY 10AM TO 1 PM
MARCH 20, 2004	NNBM DELTA DART SESSION for CUB SCOUT WEBELOS 2PM TO 5 PM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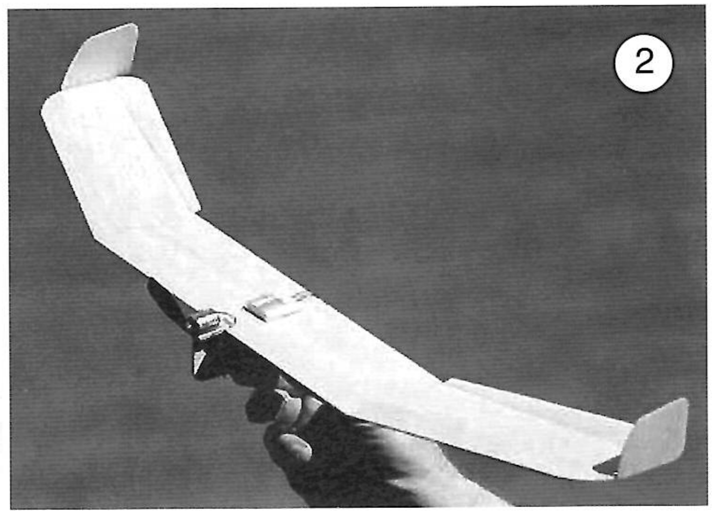
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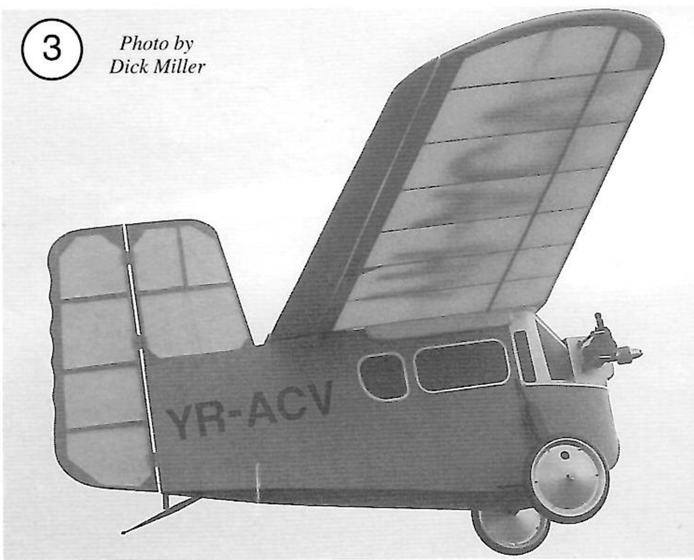
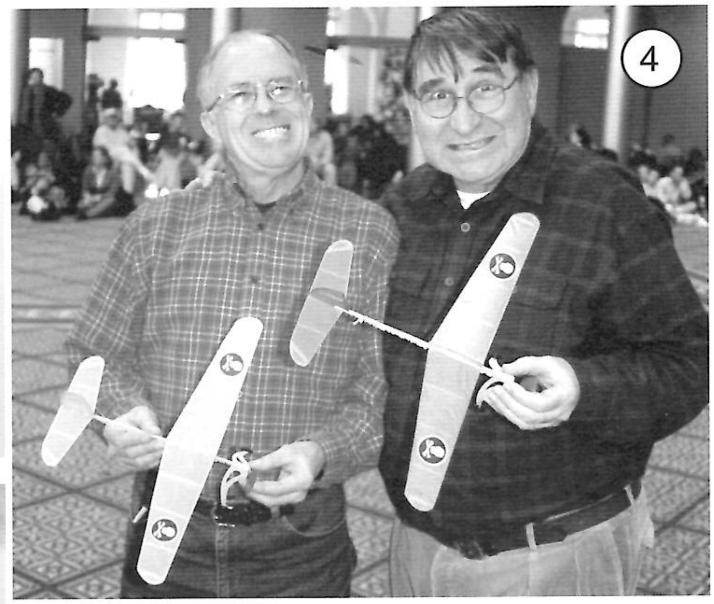


3 *Photo by Dick Miller*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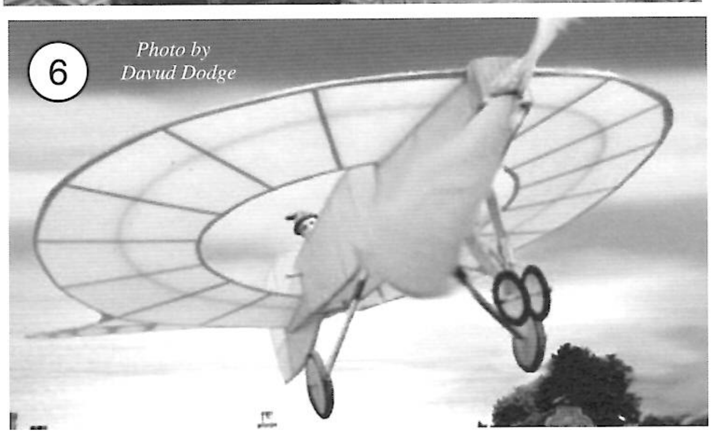
6 *Photo by Davud Dodge*

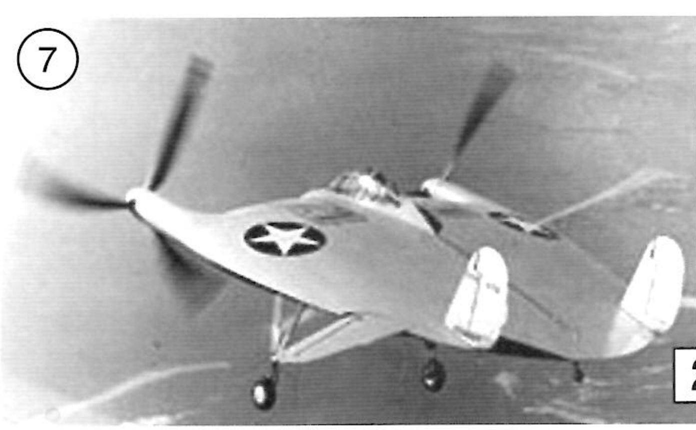
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Photo by Lindsey Smith 8

Flying Wing Issue

Stew Meyers Editor

I have always had a thing for flying wings. I guess going to Northrop and listening to the tales from the guys that built them in the 40's had something to do with it. We published Vance Gilbert's rubber powered B-49 a few years ago and more recently Bob Marchesse's Horton. I have recently built a couple of sport wing designs from British model mags for small electric motors. I have also collected some designs from this side of the pond that appeared years ago. So here it is, the **Flying Wing Issue** Featuring: *Sizzle, WingDing, Buzzbat, Gull*, & *Jet Wing.* I have had great success in converting the Jetex and CO2 models to electric. Give one a try.

There is an interesting article on flying wing design by *Martin Hepperle. John K. Northrop*, my hero, gives an interesting account of the cover ship. *Karl Nickel*, a Horton test pilot, gives the common sense plea to keep the CG ahead of the CP or NP as it is referred to here. This advise of course applies to conventional designs as well. An aft CG has killed many a model as well as pilots of full scale ships.

PHOTOS Page 2

1. Our editor Stew Meyers with his all foam electric powered free-flight *Wing Ding.*
2. And another of Stew's wings, *Sizzle*; this one is all balsa and uses a N-20 & Li-Poly battery.
3. Our correspondent in Pennsylvania, Dick Miller, sent this photo of his electric R/C Stabiloplan IV.
Recently Dick had By-pass surgery and we are sure he would like to hear from his friends. His address is 193 Huntzinger Road, Wernersville, Pennsylvania
4. No, not flying wings but that dynamic duo of Dan Driscoll and Stew drumming up business for the NBM sessions this coming winter
5. Alexander Calta with granddad Don Srull's R/C electric bird, not really a flying wing but close enough and is a great flyer. It is a delight to see how it attracts swarms of Swallows.
6. A Lee-Richards Annular wing by David Dodge from his web site listed here. Take a look at it; it is loaded with interesting and fun aircraft info. ---http://home.att.net/~dannysoar/home.htm -----
7. Not a model but an interesting Vought aircraft which has been modeled and seem to remember a kit??
8. Our friend across the Atlantic, Lindsey Smith snapped this photo of Doug McHard's Waterman Arrowbile. It is powered with a compressed air motor and now belongs to Lindsey.

JUL/AUG 2003 MAXFAX PHOTO PAGE CAPTION ERRORS

Page 2- photo number 2. -----
Mark's plan is a 'pseudo' 10-center not a PEANUT.
Doh!
Page 2 - photo number 6. ----
The model and photo are the work of Bob Clemens not that of Jiro Sugimoto ---
Apologies to both gentlemen.

Thanks to Bob for pointing this out.

The flying wings in this issue are all sport models. These may not be the most efficient designs but, hey, they do fly well and the basic principles are there. Maybe we can do a scale issue in the future. Most use deflected elevons and/or sweep back to balance the pitching moment. A flat air foil ain't exactly a reflex shape. The *Buzz Bat* and *Gull* represent reflex designs of a more advanced nature. I have censored the math in the design reference to protect the non - engineers. Go to the web site to learn more.

Watching the *Rapier* powered lawn darts at Muncie last week and my own gently soaring converted JETEX *Sizzle* tells a tale. The speed range of the electric free flight is much less critical than the hand launch glider type speed range of the Jetex/Rapier model. Try an Electric Flying Wing model for relaxing FUN!

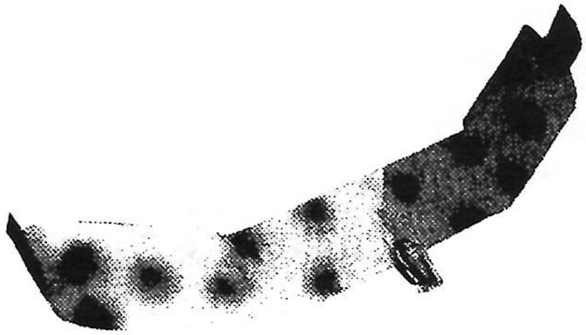
Comments on the JET WING

The *JET WING* article shows its age. Obviously the JETEX 100 is not the smallest, the JETEX 50 came out soon after. Today the RAPIER would be a logical power unit for a Jet version. I would back off on sheet sizes, say 3/32 for the 3/16 sheet parts. I would go even further with the fuselage substituting 1/8 for the 3/8 sheet. The rear end needs to be modified if you are not using the JETEX 100.

Of course, I would make it an electric tractor, ditching the fuselage entirely in favor of a minimal pod to mount the motor and battery. A GWS low voltage motor would work as would a geared N-20. It all depends on what kind of flight you are looking for. The GPS LPS can give a Jetex like performance and the N-20 a relaxed fight.

Another model not presented here, is the Pharis Flying Wing for the Jetex 50. This sport job of built up stick and tissue construction is still available and is 27.5 inches in span for a gentle flight. It features both a reflex airfoil, geometric twist, and sweep back. This again would be a natural candidate for a GWS LPS motor.

If you are interested in Flying Wings try http://www.twitt.org/ and http://www.nurflugel.com/



Got your Jetex (or Jet-X) handy?
Have a go at David Binns fun flying wing!

SIZZLE

MY APPRENTICESHIP ON Jetex lasted from the twin-50 Helicopter to the 350 Magnum; and I really enjoyed using these motors, particularly their lack of torque effects — and there was considerable entertainment from the shrieks of those who had forgotten to let the engine cool before reloading!

I kept a 50 unit complete as a momento, but when I heard production was resumed, and had even been improved, it had to be used.

Now the easiest of all designs to me is a tailless, as you really have to get it wrong for it not to fly, so I drew out the wings on a piece of 1/8in. balsa, cut out the fins and elevons from some l/64in. ply and with a piece of l/l6in. ply cut up to make a laminate mount, glued it together with white glue. The next day I tried it, and had to move the engine forward ~4in. but then it flew.

It might fly better if you lengthened the centre section, or shortened it. 1/l6in toe-in on the fins might or might not help. Who knows? In other words, you can alter this one in minutes to suit whatever ideas you may have. I sprayed mine half blue and half scarlet, with black spots, using car aerosols I had in my garage, but this treatment is definitely optional! The best of luck...

Building (if so it can be called)

Cut out the wings from 1/8in. medium soft balsa and cement together, making sure all is flat. Rub down with gloss paper, merely rounding off the edges. Cement the elevons in place, packing them 3/8in. up at the tips, and cement on the fins. Build up the engine mount from 1/2 x 1/l6in. plywood and screw the motor mounting in place.

Cement in the mounting making sure it s square, and add the under fin.

Aerosol finish to taste and add name and address! Fit an unloaded motor and bend elevons up or down until a satisfactory glide is achieved. Do not alter position of the fins or change the balance.

Jet-X explain better than I can how best to use the motor and its effects (see also the review in the October 1986 Aeromodeller).

This is either a beginner s model, or one for the experts to modify to their own taste. It s quite fun as it is!

Building time is just one hour.

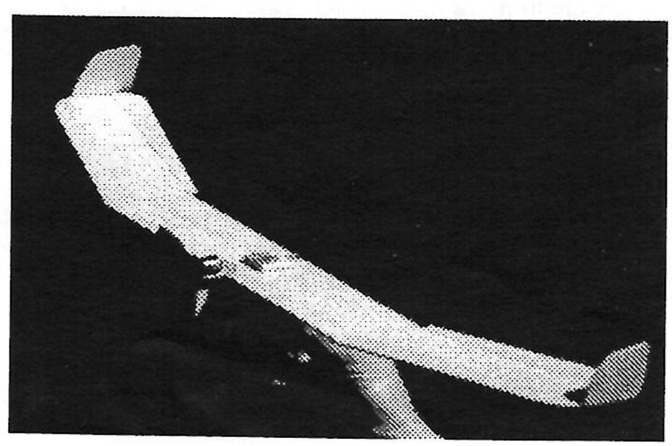
What' s stopping you?

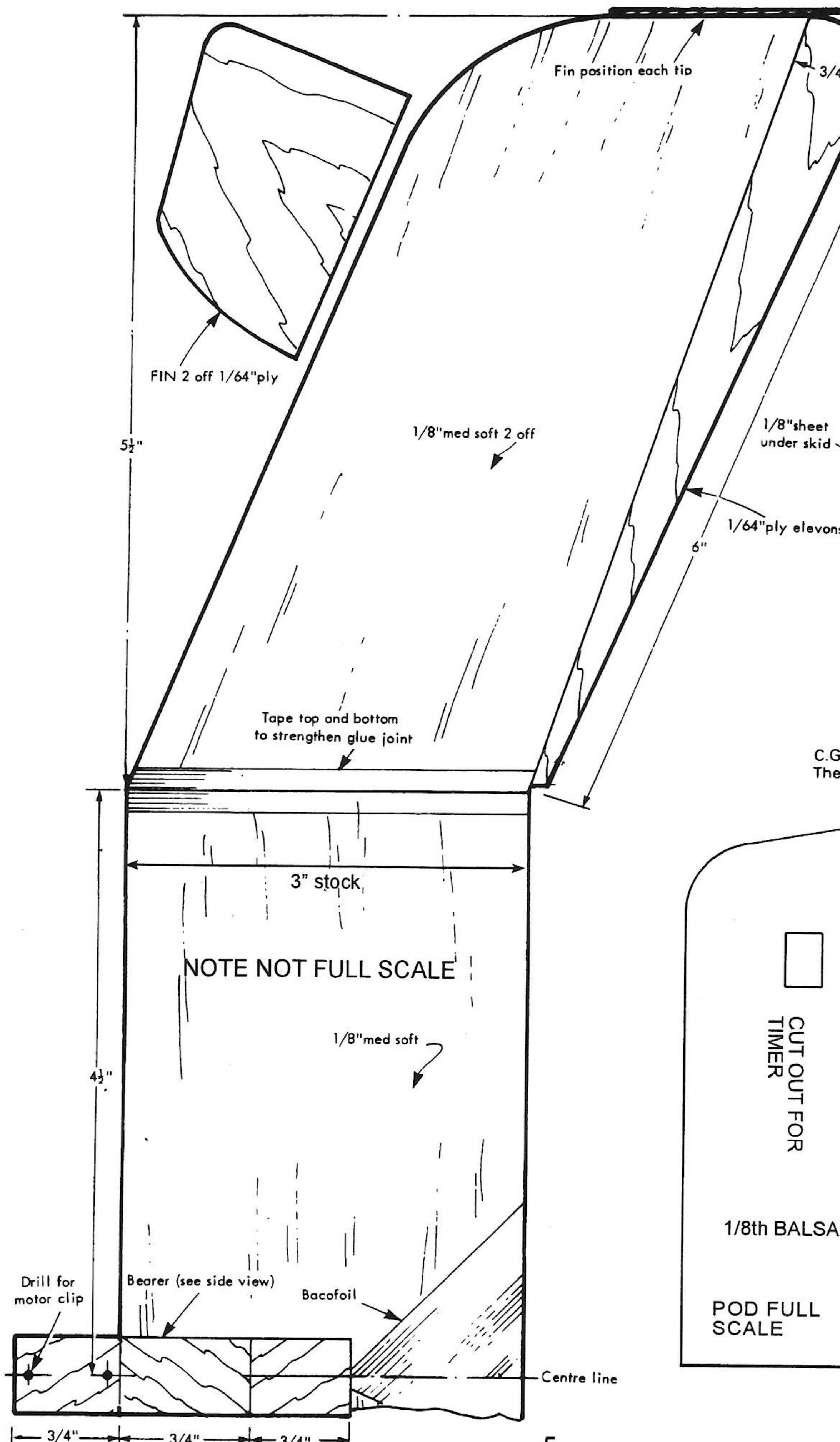
This article by David Binns appeared in the March 1987 *AEROMODLER*.

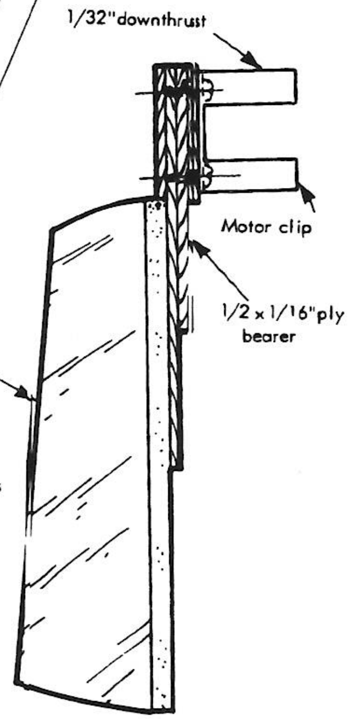
Well I looked at the plans, these by the way are not presented full scale, and decided to use 1/16 sheet rather than 1/8th. 20 inches of 3" x 1/16 stock does the job. I also replace the $1/64^{th}$ ply with 1/32 balsa. The tips are swept back 22.5 degrees so I used the cut off piece to jig the elevons up 22.5 degrees. I added a 1/8 sheet fuselage to carry the tractor N-20 HV direct drive motor with a Union 3" prop. Naturally I used a timer and a Kokam 145 Li-poly cell. Well actually before I added the fuselage pod, I attached a clamp type paper clip to the leading edge and established the correct cg with glide tests. This turned out to be 1" from the LE or 33% of the chord. There is 3/8" dihedral in the outer panels. Finish is nil- raw balsa. The wing was assembled with Ambroid.

All up weight is 21 grams with 60 Sqin area for a wing loading of 1.78 oz/sqft. It flies like gangbusters!

What would I do different next time? Well I might finish the balsa with glider polish or light stained dope and extend the building time to 3 hrs. Or maybe break out the Jetex.

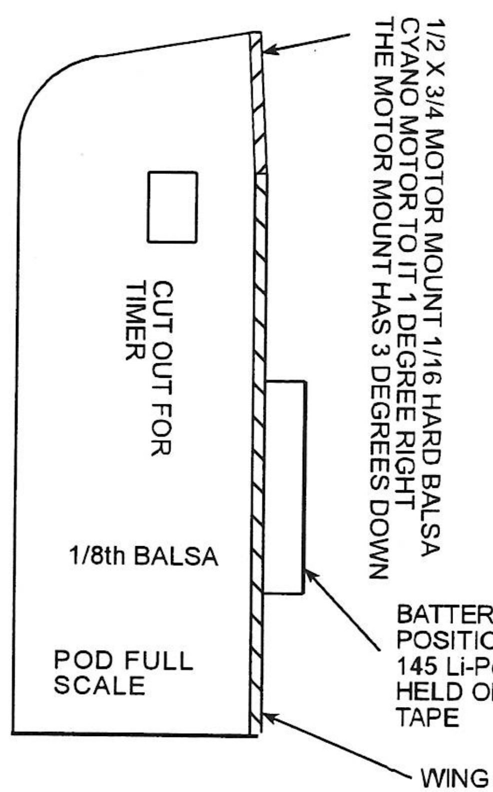






SIDE VIEW

C.G. position: 50% roo chord
Thereiis no dihedral



Buzz Bat

by FRANK EHLING

The C02 motor has given the modeler a chance to display his talent for design, because the model can be built quickly, and if there are any changes they can be made easily. The engine can be run at any speed to get the ship to do just what the builder wants. The engine can be made to run in either direction, which is handy when you want to make a pusher or tractor; none of the work of carving the prop is lost since it can he slipped on the shaft either way.

Now all we need are a few brave modelers to give us something a little different from that pylon design (the pylon is the best under the AMA duration rules). It may be a good idea if clubs would add a design event to their contests, with some nice prizes—that's the best way to get modelers working.

When the Buzz C02 engine was announced we wanted to try it right out, and the flying wing looked best to us for the purpose. A flying wing is simple; dihedral in the wing is used for lateral stability; sweep-back with upturned wing trailing edges gives longitudinal stability. The rudders are placed at the wingtips as this is the point farthest behind the C.G.

WING—As there isn't any fuselage to slow us up we ll start right in on the wing and cut out the ribs along with the spars and trailing edges. Lay out the spars over the plan and cement ribs in place. (Use wax paper over the plans, of course.) The leading edge can now be cemented in place. Cut out the wingtips—from bending stock, because they will have to be warped later to make the wing glide properly. Sand the wing frame smooth—this is important because only with a smooth frame can you do the best covering job. If the framework is rough, the covering job will look as if it was done in the dark. When you are sure the wing is smooth, go over any weak joints with cement because if the wing is weak it will warp out of shape when covered.

Cover the wing in sections: 3 on top and 3 on the bottom. Spray with water; when dry, coat with dope diluted 50% with thinner. Dope is rough on light, structures so add a few drops of castor oil to your thinned mixture to keep the dope from pulling the wing out of shape.

The rudders can now be cut out, sanded smooth and cemented in place. Be sure they are cemented on straight as it takes only a little rudder to force your model into a turn.

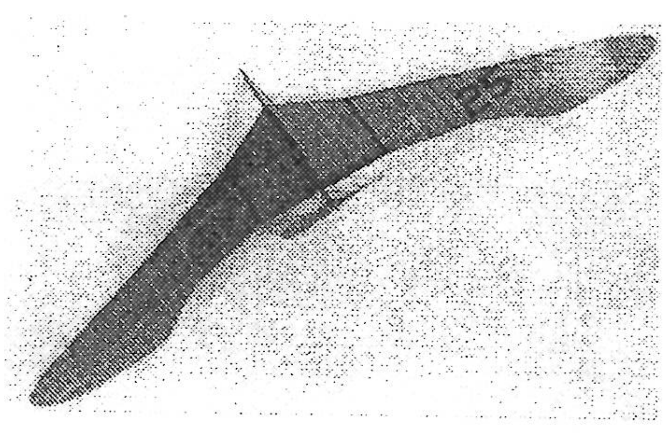
The tube that holds the tank and motor is bent around a dowel. Cement a plywood bulkhead to the end, cement the seam well, and attach the motor. Fasten the tube in place on the wing and, when dry, slip in the tank and glide the ship. When the glide is flat (obtained by sliding the tank back to check a dive, and forward to kill a stall), cement a balsa block to the front end of the tube and streamline to shape shown on the plan.

The prop is carved from a block of bass or pine. Carve thin blades, but be sure to dope well as too light a prop is hard to get running in the direction you want.

There isn't much to say about flying the wing as adjusting is very easy. Bend up the wing tips to get the ship to climb, and if one is bent more than the other it will tend to turn the model.

When you have finished your model and learned what makes it tick, you will want to try one of your own design—they are a lot of fun!

Note that the tube from the motor runs to the forward end of the tank. Don't reverse the tank—If you do, liquid CO2 will run through the motor as soon as the model starts to climb and the motor will immediately slow down and probably stop running. If the tubing is run as specified. liquid CO2 will not reach the feed pipe when the model climbs and if the nose should point down the motor will stop—a good safety feature.



October 1948 issue of Model Airplane News

THE WING THING

Can t go flying tonight Jim, broke my model last week and can t afford to replace it -the wife is watching our bank account! Even if I had a model to build, I don t have the time at the moment - work's a pain."
Sound familiar? Well there s good news for Jim: he and his mate can go to the ball (or at least the flying field). Just look in your scrap box and pull out a 4in. wide sheet of 3/32in. light balsa sheet, a 2 x 5 1/2in. piece of 1/4in. balsa sheet, a small piece of 1/16in. ply and an old C02 motor. Invest an hour of your time, and you re flying.

Construction
Many models are described as 'simple model to build - but for once that phrase is fully justified with the Wing Thing: a glance at the self-explanatory plan shows that it is so straight forward that written instructions are unnecessary, so I ll just briefly describe the process I used.
1. Cut out all the major parts i.e. two fins and rudders, two wing panels and a motor pod (fuselage).
2. Mark the rudders and the elevons on the relevant pieces of balsa, then cut partially along these marks. Not all the way through - just enough to manipulate the parts. Now balsa cement the small pieces of fuse wire hinges in place i.e. on the inside of the fin/rudder and underneath the wing.
3. Glue the fins to the wings, using the fin set guide.
4. Now glue the outer wing panels to the centre panel, setting the outer panels with the correct amount of dihedral.
5. Once the wing is completely dry, glue the motor pod/fuselage in place.
6. Fit the motor mount and motor - and that s it, fully built. Finishing? Don t bother - it only adds weight/wastes time. OK, so I did colour mine with a very light spray of car paint aerosol on the bare wood. Felt-tipped pens could be used too.

TO infinity - and beyond!
Before committing the beast to the wild blue yonder, please check the following:
Model balances at the point marked on the plan (very important). A 2p coin was glued to the nose of the original.
The motor has no down or side angle: start with them in contact with the bottom of the fin.
There are no warps! Start with some hand glides (no motor): it should fly straight with no sign of stalling. If it does stall, adjust by adding weight to the nose. Once happy with the glide, start adding power, a little at a time, until the model climbs away in nice wide circles. Adjustment to the turn can be made by moving the rudder or elevons (once correct trim has been achieved, glue the trim tabs in place) but I prefer to adjust the turn by motor adjustments. The Wing Thing is a great fun model and if you have never built a flying wing before it s a teaching tool for learning how a flying wing works. Just a word of warning: make sure that you have enough space to fly: the Wing Thing is not a natural thermal soarer, but on my third trimming flight, the prototype caught some lift and I had to watch nervously as it flew in a graceful climbing circuit above my head for 3 minutes. Fortunately on that day there was no drift - it landed back at my feet. Phew!

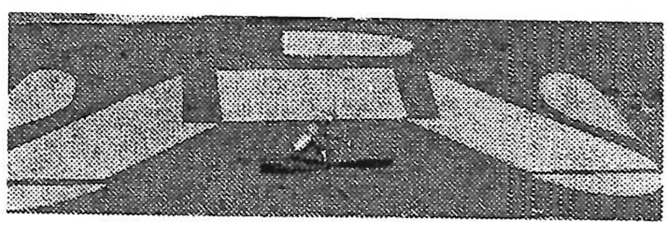
The above article and plan were lifted form the May 2000 issue of Aero Modeler International. Unfortunately the color (excuse me- colour) photos accompanying it don't have good black and white contrast.

WING THING II
AN ELECTRIC FOAMIE
Stew Meyers

I need a quick test-bed for the Ultra-Cap 1 Farad capacitor I had acquired. This little wing seemed to fill the bill. I scaled it down to 95% and build it out of 1/16th blue foam. While I was at it, I made it a tractor. The pod was 3/32 balsa. With a direct drive N-20 all I achieved was a prolonged glide. The 2.4 volt limit on the capacitor was too low for the motor. I then used three 50 mah Nicads with a timer and it became a nicely performing flyer. The foam is a little weak and is much repaired. Perhaps some Tyveck reinforcement is required.

I then replaced the Nicads with a Kokam-145 Li-poly cell and lost 8 grams and gained a few volts in the bargain. The performance was much improved. I was using a low voltage N-20, this was replaced with a high voltage N-20 and the performance improved again. After some bench testing I did for a FM article, I discovered that the 3" Union -80 prop loaded the LV motor too highly.

Since it had no DT, the inevitable happened and it flew away one day at Remington. I then proceeded to build one per the original plan and power it with a 4.3:1 geared HV N-20. This flies fine, and is more rugged than the Foamy. After my experience with *Sizzle*, I think a N-20 direct drive 75% built of 1/16 balsa sheet would be interesting.



The Gull

by **DONALD C. BROGGINI**

Here's a model designed especially for the smallest engines

HERE is a ship designed specifically for the Infant Torpedo. It's a flying wing, which of course is a novelty, but it is more than that. A few high lights of the Gull will convince you of the superiority of a plane of this type over that of the conventional type. The flying weight is 2.1 oz., wing area 160 sq. in., which results in an exceptionally fine glide. This combination of low weight and large wing area is easy to obtain because there is only a wing and rudder. The weight and drag of the fuselage and stabilizer are eliminated. It is exceedingly difficult to get a conventional Infant craft down to this weight. If one did succeed, the plane would be weak, small, or both. The entire structural weight of the Gull is concentrated in the wing, thus giving a large plane of considerable strength, lightweight, and the extremely low wing loading of 1.9 oz. per square foot. The low power loading and virtual absence of parasite drag gives a good climb. A larger airplane will naturally have more drag than a smaller one, but in a large flying wing, this is compensated for by the virtual elimination of parasite drag. Thus the total drag of a large flying wing and small conventional craft are about equal.

The Gull is completely stable in all aspects, being the sixth of a series of flying wings. Three factors are used to obtain stability; namely, sweep-back, washout, and a moderately reflexed airfoil. The airfoil is not a heavily reflexed section, which has a poor lifting coefficient, but is a modified Clark Y. This results in a high lifting section, yet one of the stable variety. The handling characteristics of the Gull are the same as those of any conventional plane.

You will note that the Gull is a tractor. This eliminates: (1) the need for carving a "left-handed" propeller; (2) the difficulties involved in getting clear of a pusher propeller during launching; and (3) the reverse thrust on the motor (which is not designed for reverse thrust).

The Gull was entered in the 1949 Mirror Model Flying Fair; after a four-second flight for its first official due to a bad takeoff, the plane, nevertheless, accumulated enough time on its second and third flight to place in the money.

It is not recommended that you power this with a motor the size of an O.K. Cub, or a Baby Spitfire. A 1 oz. airplane behind a motor of such size would prove a bit tricky. The Infant is just right.

The Gull consumes little time, work, and expense in its construction. The original took only a day to build. All parts necessary to build the plane are shown full size in the plans. It is not necessary to scale up the top view to build the wing. The outline of the wing is sufficient. To obtain the 30-degree angle for the sweep back, measure outboard 13" from the front of rib No. 4, then aft 7-1/2". This will give the front of rib No. 11. Each wing panel is 13" long. The distance between ribs No. 1 is the width of the firewall C. The distance between all the remaining ribs for both center section and outer panel is ahout 2" when measured along the trailing edge.

The first step is to cut out the ribs from 1/16" medium soft sheet. Ribs Nos. 5, 7, and 9 were omitted for the sake of clarity, but they may be approximated very accurately. Use 1/8" square hard balsa for the wing spars, and leading edge. Shape the trailing edge from 1/8" x 1/2" medium hard balsa.

Let us begin with the center section. Lay down the trailing edge in such a manner that the upper surface is horizontal, and also lay down the lower spar. Now add ribs No. 1 through No. 4, the leading edge and the main spar. The outer panels are constructed in similar fashion except that they have washout. Lay down the leading edge and trailing edge, cementing lightly at rib No. 4. Now block up the trailing edge 13/32" at rib No. 11 as noted in the plans. This will give the required 7-1/2° washout in the outer panels. Add ribs No. 5 through No. 10, and the main spar. Since the wing has a twist in it, the spars and trailing edge should also twist. However, if the notches in the ribs for the wing spar are made oversize, the spar may remain straight and the rib twist about the spar. Cement these joints well. To obtain a twist in the trailing edge, twist the wood a few times to put a permanent set in it. The technique for building washout into the wing should afford no difficulties. After the wing has dried, remove and add the dihedral by blocking each tip up 3". Cement all joints well and add a few extra coats at the wing breaks. Do not forget to fill in the opening in the ribs caused by the deep set main wing spar.

The nacelle consists of formers A and B, and firewall C. Make them from medium hard 1/16" sheet balsa, the firewall being composed of three sheets of 1/16" balsa cross-grained. Fasten formers B to the inside of ribs No. 1, then cement firewall C in place. Now, add former A, and cement all joints well. When dry, bolt the motor in place, being sure to put washers on the backside of the firewall to prevent the nuts from sinking into the wood. Cement the nuts in place.

Cut elevators F from medium balsa and attach to trailing edge by cementing, or by soft aluminum hinges as you prefer. Add 1/16" sheet gussets to ribs Nos. 1, 4, and 11.

The rudder consists of D, E, G, and H. Make D and the lower portion of E from hard 1/16" sheet balsa, and the rest from medium. The grain runs vertically on E except for the lower portion where the grain runs horizontal. Cement H and D onto E. Add both G s as shown in view A-A, being sure to have room for the tank which comes down between them.

The landing gear is composed of a 7/8" dia. balsa wheel made from two sheets of hard 1/16" balsa cross-grained. Tubing or small washers cemented to the wheel make good bearings. The landing gear wire is a U-shaped affair about 2" long with upturned ends of about a half inch. Make from .025" music wire.

Covering: The original model was covered with lightweight red silk span. Red was chosen because of its excellent visibility, both on the ground and in the air. The nacelle was covered with yellow paper. Be sure to have the grain of the paper running parallel to the main spar. Water spray and let dry. Dope with plasticized dope—that is, mix about three drops of castor oil per ounce of dope. Apply a coat of dope to the rudder. Fuel proof the plane. A little care used while doping to insure that no warping takes place will be well worth the time spent. If warps are present, other than the 7-1/2-degree washout, twist the wing to the new position while the covering is still wet and hold there until the covering pulls tight.

Flying Instructions: Attach the rudder to the wing by running a rubber band through the hole in E, over the wing, and then on to G. The plane should balance about 1/2" behind the main wing spar. Test glide. preferably in a grassy field. If the plane is nose heavy, it may be corrected by: turning the elevators up, adding clay to the end of the rudder, or by removing some of the washout from the wings. This may be done by quickly brushing a coat of thinner on the wing to loosen the paper, and then twisting the wing until the paper sets again. If the plane is tail heavy, the opposite procedure should be used.

Use the rudder to obtain a turn in the glide in preference to using the elevators as ailerons. Offset the thrust line as necessary to obtain a climbing turn opposite to that of the glide. The Gull appears to have a large amount of down thrust, but this is mostly an optical illusion. Down thrust is usually measured from a line parallel to the stabilizer chord line which on the Gull is the wing tips. The eye, however, tends to measure it from the wing center section which puts the apparent down thrust in error by 7-1/2°. The original gave best results with a left climb and a right glide.

You will find the Gull a sturdy, consistent performer. Try this plane and see for yourself the advantages of a flying wing. Happy flying!

Notes on building the Gull

Stew Meyers

This article and plan are from the March 1950 issue of *Model Airplane News*. Again this is one I have drooled over since my youth. I did have an Infant and still do. But I never built the Gull, the construction rather daunted me at the time. I might build it now, but more likely would use a GWS LPS low voltage motor with a 4:1 gear ratio and a 6-5 prop. A HiTech 250 mahr Li-poly and a timer is a nice combo with this and about produces the power of a K&B Infant Torpedo for about the same weight. Of course it's a little cleaner, quieter, and starts every time. The timer also allows you to dial in you motor run. A bit better than guessing how much fuel is in the tank. Or maybe I would sneak in a small radio to control the motor and rudder to keep it out of trees. This would only add 10 to 14 grams more weight.

Comments on the Buzz Bat

Stew Meyers

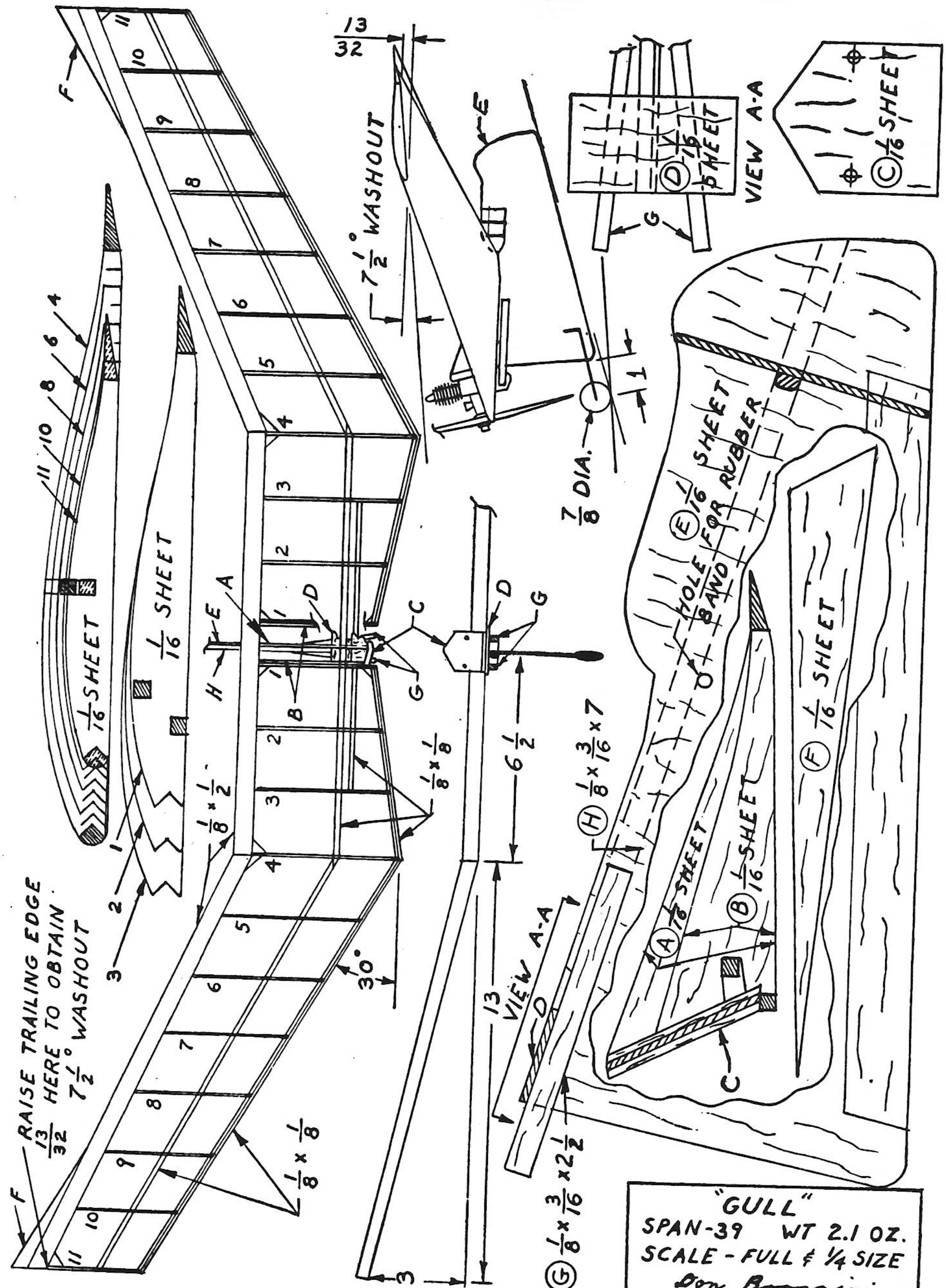
Well this article from the October 1948 issue of Model Airplane News may be a little dated. The Buzz engine was a short lived version of Brown's Campus CO2. Both of these had a long tubular tank which accounts for the tube fuselage. You can of course use a modern CO2 motor. Make a new pod to mount the motor and attach it to a beefed up rib #1. Mount the tank on the CG. What's that? You say Frank forgot to tell us where that was.

The airfoil on the *Buzz Bat* is not really reflexed as drawn. Rib #1 is, but the rest are not. You might get better results using the rib shape from the *GULL*..

Before you mount the motor, ballast the wing and try some test glides to establish the CG. If you keep the pusher motor position you will probably have to ballast the nose after you mount the motor. Don't be tempted to use the tank to do this. The ship will stall as the CG shifts aft when the CO2 is consumed.

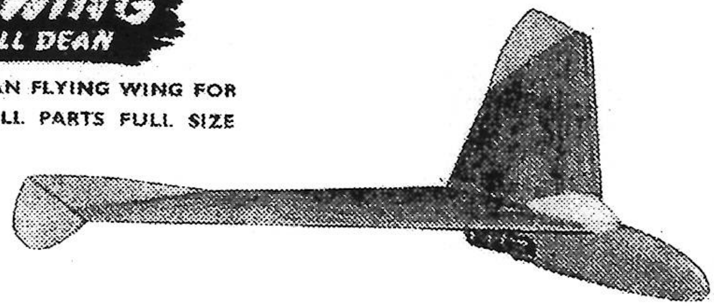
Of course an electric motor will not present this problem and you can use the battery as ballast safely. A Li-Poly will fit neatly inside the wing, sheet on the bottom between ribs 1 & 2 will support it. A geared low voltage N-20 would be a nice choice or you could use Micro 4. I would mount the Micro 4 as a tractor as it's a bit heavy to counteract with batteries. If you don't use a timer use two 50 Ma Nicads. Or use a KP00 with three Nimh cells or a Li-poly with a timer.

Another approach would be to use two direct drive high voltage N-20's with 3" Union props as pushers, each centered on a beefed up rib #2. That would sound great! A single 145 Li-Poly could power both in parallel. Boy, I am talking my self into building this. I have admired this plan since my junior high days. My Campus tank leaked, so I never built it. I can also see putting a RFS radio into it running a mag actuator on each elevon.


RAISE TRAILING EDGE
13/32 HERE TO OBTAIN
7 1/2° WASHOUT
13/32
7 1/2° WASHOUT
1/16 SHEET
1/16 SHEET
1/8 x 1/2
1/8 x 1/8
1/8 x 1/8
1/8 x 1/8
30°
13
6 1/2
3
7/8 DIA.
1
VIEW A-A
D 1/16 SHEET
C 1/16 SHEET
E 1/16 SHEET
HOLE FOR RUBBER BAND
F 1/16 SHEET
B 1/16 SHEET
A 1/16 SHEET
VIEW A-A
H 1/8 x 3/16 x 7
G 1/8 x 3/16 x 2 1/2
"GULL"
SPAN-39 WT 2.1 OZ.
SCALE - FULL & 1/4 SIZE
Don Broggini

JETWING
BY BILL DEAN

BUILD THIS 19" SPAN FLYING WING FOR THE JETEX 100. ALL PARTS FULL SIZE



THE smallest Jetex propulsion unit—the 100—is ideal for all sheet models of the chuck glider variety. We have based the Jetwing design on experience gained with sheet flying wing gliders. All up weight of the model presented here is slightly less than 2 ounces.

An average speed builder should not take more than three or four hours to get this model ready for its first test flight. Construction is simple—providing you follow the correct building sequence. All parts are given full size, so trace or pin prick them on to the appropriate thickness sheet. The one-third scale drawing on the opposite page gives assembly details.

Begin by cutting out all the parts. Two laminations of 3/16-in. sheet—instead of the 3/8-in. sheet—may be substituted for the fuselage (1). Two pieces (5 and 6) will have to be joined for the main wing panels because of the width.

WING

Pin 5 flat on the plan, then cement (and pin down) 6 and 7 to it. When dry, remove from the plan and shape to the indicated sections. Use a sharp razor blade to trim away most of the surplus wood, then finish off with fine sandpaper. Note than the wings do not taper in thickness towards the tips.

Build the opposite wing panel in the same way. Now place the central edges of the wing panels on the edge of the building board and sand them to a slight angle for the dihedral. Pin one panel to the building board and prop up the other 3-1/4-in. at the tip, then cement together. Now cut away the tips (7) and re-cement them in place at the angle shown. Pin each panel flat on the board in turn and use the angle template "X,, to obtain the correct incidence.

FINS

The fins are toed in and are upright in the front view. The best way to ensure fitting them accurately is as follows. Invert the wing and prop it up at zero incidence by insetting a support under the centre section (about 3-1/4-in, high). Now attach the fins, checking for vertical alignment with a square placed on the building board.

The outer edges of the fins are left flat and the inner faces rounded off at the leading and trailing edges.

FUSELAGE

Cement the 1/4-in. sheet fairings (3) to either side of the fuselage (1). Cut a shallow "V" for the wing seating and cement the wing in position. Add the cabin (2) and the piece of hardwood for the Jetex clip mounting. Carve the sheet fairings and the fuselage to shape, then finish off with fine sandpaper to the correct section.

JETEX MOUNTING

The Jetex clip is secured to the hardwood bearer and a loaded Power Unit attached. The model should balance at the point indicated (1 1/2-in. forward of the T.E. at the centre). A slight C.G. variation is permissible, but if the balance is badly out, move the clip backwards or forwards to achieve balance.

FINISH

Give the entire model one coat of banana oil. The fuselage pod may also be given two coats of coloured dope if desired. The original model has an orange fuselage. Be careful not to put up the weight too much or the performance will suffer.

FLYING

Test glide in the usual manner. If the model stalls, push a few pins into the nose. Most likely the model will turn either one way or the other. If the turn is gentle, leave it as it is.

We found that turn is best adjusted by weighting one wing tip with a paper clip. Push the paper clip on to the L.E. and slide it in or out to alter the degree of turn.

Use HALF a standard fuel charge for the first few test flights, until you are quite sure of the trim. A wide spiral in either direction is the best way of getting maximum height. Launch the model already banked into its natural turn. Wait for the thrust to develop before launching.

By taking off the turn, the Jetwing can be made to perform perfect consecutive loops. We have had as many as ten on a twenty second (full) charge. Still air duration (normal circling flight) is 1 to 1 1/2 minutes and the model is stable in even the windiest weather conditions.

As we were unable to make the first Jetex Contest—held at the 1948 Isle of Man Rally—John Wood took over the original model and flew it proxy, to gain second place.

The model was also flown in the Flying Wing Power event and, this time placed fourth, bearing out our opinion that Jetex models stand a good chance in open power contests. Jetex 100 models with built up wings are capable of flights of three to four minutes in still air conditions.

This originally appeared in the IAN ALLAN LTD. MODEL PLANES ANNUAL of 1948 or 1949.

Basic Design of Flying Wing Models

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Airfoils for Flying Wings

Tailless planes and flying wings can be equipped with almost any airfoil, if sweep and twist distribution are chosen accordingly. Thus, the one and only "flying wing airfoil" does not exist. However, if we want to design a tailless plane with a wide operating range, the wing should have a small amount of twist only, or none at all, to keep the induced drag at reasonable levels throughout the whole flight envelope. Under these conditions, the wing must not create a large variation in moment coefficient, when the angle of attack is varied. This makes it necessary, to use airfoils with a low moment coefficient. In the case of an unswept wing ("plank"), even an airfoil with a positive moment coefficient is necessary, to avoid upward deflected flaps under trimmed flight conditions. Such airfoils usually have a reflexed camber line.

Longitudinal Stability

Like its full sized cousins, each model airplane should have a minimum amount of stability, i.e. it should be able to return to its trimmed flight condition after a disturbance by a gust or a control input. How much stability is required, depends on the pilots personal taste: contest pilots prefer a small stability margin, beginners like to fly with a large margin. Here, only a brief introduction into the topic will be given, which will make it possible to find a first guess for the center of gravity and a reasonable combination of sweep and camber for a flying wing.

Unswept Wings (Plank)

While the horizontal tailplane provides the necessary amount of longitudinal stability on a conventional plane, it is the wing, which stabilizes an unswept wing. In most cases, airfoils with reflexed (s-shaped) mean lines are used on flying wing models to achieve a longitudinally stable model.

Some important Aerodynamic and Mechanical Facts

To understand, why a reflexed airfoil is able to provide longitudinal stability to a wing, two things are important:

Total Force and Moment, c/4 point

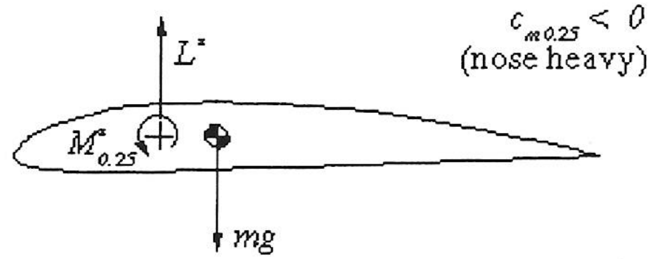
The pressure forces, which act on the surface of each wing section, can be replaced by a single total force and a single total moment. Both act at the quarter-chord point of the airfoil. When the angle of attack changes (e.g. due to a gust), the moment stays nearly constant, but the total force changes. Increasing the angle of attack increases the force.

Center of Gravity

Translations and rotations of "free floating" bodies are performed relative to their center of gravity. When the angle of attack of a plane changes, the plane rotates (pitches) around its center of gravity (c.g.).

Equilibrium

Let's have a look at a trimmed flight condition, where all forces and moments are in equilibrium and let's compare a conventional, cambered airfoil with an airfoil with a reflexed camber line. The moments and forces for this trimmed state are denoted with an asterisk (*). The forces are the weight of the model m, multiplied with the gravity acceleration g (9.81m/s) and the aerodynamic lift L, which have to cancel out (sum of forces in vertical direction equals zero). The drag forces are neglected here. The sum of the moments around c.g. (caused by the airfoil moment M and the lift force L, acting at a distance from c.g.) must also be zero.



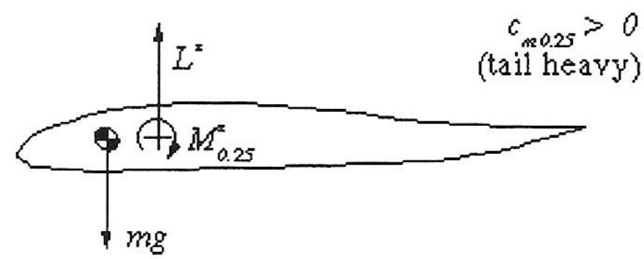
conventional airfoil with camber

Equilibrium State

This airfoil has a nose heavy moment. As stated above, the center of gravity is also the center of rotation of the wing. When it is shifted behind the c/4 point, the air force L* in front of the c.g. counteracts the nose heavy moment M* to achieve equilibrium. The distance between c.g. and c/4 point is depending on the amount of M*. A symmetrical airfoil has M*=0, which means we have to place the c.g. at the c/4 point.

Disturbed State

When the angle of attack is increased (e.g. by a gust), the lift force L increases. Now L>L* and the tail heavy moment due to the lift is larger than the moment around c/4, which still is M=M*. Thus the wing will pitch up, increasing the angle of attack further. This behavior is instable and a tailplane is needed to stabilize the system.



airfoil with reflexed mean line

Equilibrium State

The reflexed camber line makes the moment coefficient positive, which means, that the moment around the c/4 point is working in the tail heavy direction. Therefore the center of gravity has to be located in front of the c/4 point to balance the moment M* by the lift force L*. The larger the moment (-coefficient) of the airfoil, the larger the distance between c/4 and the c.g. for equilibrium.

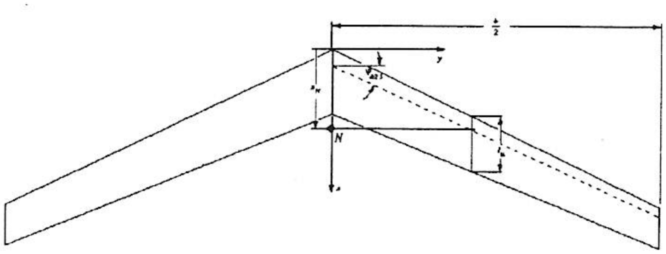
Disturbed State
Here, we have the air force acting behind the c.g., which results in an additional nose heavy moment, when the lift increases. With L>L*, the wing will pitch down, reducing the angle of attack, until the equilibrium state is reached again. The system is stable.

Neutral Point and Stability
As we learned above, an unswept wing with a reflexed airfoil is able to stabilize itself. Its c.g. must be located in front of the c/4 point, which is also called neutral point (n.p.). The distance between the neutral point (quarter chord point for an unswept wing) and the center of gravity is defining the amount of stability - if the c.g. is close to the n.p., the straightening moment is small and the wing returns (too) slowly into its equilibrium condition. If the distance c.g. - n.p. is large, the c.g. is far ahead of the c/4 point and the wing returns quickly to the equilibrium angle. You will require larger flap deflections to control the model, though. If the distance is too large, the wing may become over-stabilized, overshooting its trimmed flight attitude and oscillating more and more until the plane crashes.

A measure for stability is the distance between c.g. and n.p., divided by the mean chord of the wing. Typical values for this number for a flying wing are between 0.02 and 0.05, which means a stability coefficient sigma of 2 to 5 percent.

We have already learned, that the center of gravity must be located in front of the neutral point. While the n.p. of an unswept, rectangular wing is approximately at the c/4 point, the n.p. of a swept, tapered wing must be calculated.

The n.p. of our swept wing can be found by drawing a line, parallel to the fuselage center line, at the spanwise station y. The chord at this station should be equal to. The n.p. is approximately located at the c/4 point of this chord line (see the sketch below).



Geometric parameters of a tapered, swept wing.

The c.g. must be placed in front of this point, and the wing may need some twist (washout) to get a sufficiently stable wing.

Twist
The selection of the location of the c.g. to be in front of the n.p. is not a guarantee for equilibrium - it is only a requirement for longitudinal stability. Additionally, as explained above for unswept wings, the sum of all aerodynamic moments around the c.g. must be zero. Because we have selected the position of the c.g. already to satisfy the stability criterion (c.g. in front of n.p.), we can achieve the equilibrium of the moments only by airfoil selection and by adjusting the twist of the wing. On conventional airplanes with a horizontal stabilizer it is usually possible to adjust the difference between the angles of incidence of wing and tailplane during the first flight tests. On the other hand, flying wings have the difference built into the wing (twist), which cannot be altered easily. Thus it is very important to get the combination of planform, airfoils and twist right (or at least close) before the wing is built. Again, the calculation of these parameters is quite complex and shall not be presented here.

We start with the same geometric parameters, which we have used for the calculation of the n.p. above. Additionally, we calculate the aspect ratio ($AR = b^2/S$, where S is the wing area) of the wing. The selection of the airfoil sections also defines the operating range of the model. Airfoils with a small amount of camber are not well suited for slow, thermaling flight. We can design the twist distribution for one trimmed lift coefficient, where the wing will fly without flap deflections. This lift coefficient will usually be somewhere between the best glide and the best climb performance of the airfoil. With the selected lift coefficient Cl of the airfoils, we can also find the moment coefficient Cm0.25 from the airfoil polars. If we plan to use different root and tip sections, we use the mean value of the moment coefficient of the two airfoils. The required twist of the wing can be combined from two parts:

Geometric Twist
This is the twist, which is built into the wing as the difference between the x-axis of the root and the tip section. It corresponds to the angle difference between main wing and tailplane of conventional planes and can be easily measured. A positive twist means a smaller angle of incidence at the tip section (washout). Large geometric twist angles can be used to stabilize wings with small sweep angles or highly cambered airfoils, but have the drawback of creating large amounts of induced drag, when the wing is operated outside of its design point.

Aerodynamic Twist
If we select airfoils with different zero lift angles, we can reduce the amount of geometric twist. The difference between the zero lift directions is called aerodynamic twist and we need airfoil polars to find the zero lift angle. Also, a small or even positive moment coefficient reduced the required amount of geometric twist, and improves the off design performance of the wing.

Read the complete article at www.mh-aerotools.de/airfoils/flywing1.htm

On the importance of the correct C.G. location in flying wings

Karl Nickel

I would like to dedicate this lecture to the memory of Robert Kronfeld. He was one of the most successful and famous sailplane pilots in the late 20s and 30s. He was killed nearly exactly 60 years ago while testing a flying wing. The reason for this accident was most probably a wrong C.G. location of his tailless glider.

Before I come to the history of Kronfeld's fatal flight, I would like to treat this subject of the C.G. location a little more general. For simplicity, in the following only swept back flying wings are regarded. Hence, e.g. flying planks are not considered.

Tail-heaviness

Let's first assume, that our flying wing is tail-heavy, i.e. that the C.G. is too far backwards. Hence, in equilibrium flight we need additional lift at the back for the balance of pitching moments. Due to the back sweep and to the location of the elevons at the tips this lift has to be added at the wingtips, hence, both elevons have to go down there.

Now, this is a very unwelcome situation:

First: This additional lift may lead to separation of the flow at the tip and, hence, to wingtip-stall with a subsequent roll-over which may result in a spin.

Second: If this flow separation happens simultaneously at both wingtips, then a "rearup-stall" may result, which is especially dangerous near the ground.

Third: If this flow separation happens simultaneously at both wingtips, then a "rearup-stall" may result, which is especially dangerous near the ground.

Forth: Both elevons down means that the wing has negative twist. Such wings with negative washout, however, have a tendency for spiral instability. This may not be as dangerous, but it is unpleasant during instrument flight.

Fifth: This negative twist unfortunately amplifies the unfavorable adverse yaw, which is a nuisance for any flying wing. Thus control around the vertical axis is weakened.

Opposite to popular belief tail-heaviness gives no advantage for the performance. If the lift distribution of the wing is chosen optimal for the correct C.G. position, then tail-heaviness gives more induced drag, i.e. a loss.

Nose-heaviness

Obviously in this case everything is reversed. Assume, that our flying wing is nose heavy, i.e. if the C.G. is too much in front. Then, in equilibrium flight we need less lift at the back for the balance of pitching moments. Doe to the back sweep this negative lift has to be put at the wingtips, hence, both elevons have to go up there.

The conclusion from this is now obvious:

First: This negative lift prevents the separation of the flow at the tip and stops, hence, any wingtip-stall. Therefore, no roll-over should be observed and a spin-proof aircraft can be expected !

Second: Since no flow separation at the wingtips occurs, also no "rear-up" stall should be observed.

Third: Both elevons up means that the wing has positive twist. Such wings with positive washout, however, have a tendency for spiral stability while circling. This is especially important and pleasant for sailplanes, especially during instrument flight.

Let me tell you, as an example, my own experience while flying the Horten H IIIf (prone pilot position). In 1941 I entered a cumulus cloud with this ship, even that my turn-indicator was not working. At that time I had not nor have I now - an instrument flight rating. But I had trust in the words of Heinz Scheidhauer who had told me: "In the cloud keep the stick completely back and well centered . . . and wait, until the ground appears again". It worked, after a rise of 1000 meters I came out on top of the cloud. The Horten did the constant circling herself never flying faster than 70 km/h. Completely safe! With which other sailplane of that time would that have been possible? With none!

Fourth: By this positive twist the adverse yaw is dampened or even completely annihilated. This strengthens the control around the vertical axis.

Fifth: There is, however, a price to be paid for all these very favorable flight characteristics: If the lift distribution of the wing is chosen optimal for the correct C.G. position, then nose-heaviness gives more induced drag, i.e. gives a loss. If the nose-heaviness is very large, then this loss may also be very substantial.

Now you may ask: "Why would anybody in his right mind move the c g. of a flying wing too much backward ?". I have seen this done very often, it happened twice during the last two years with a disastrous result in one case. The "normal" reason for doing so is the observation, that the elevons are in "up"-position during "normal" flight. The obvious reaction is then: "Oh. the airplane is nose-heavy, otherwise the elevons would be in neutral position". Then, the C.G is moved hack, then wingtip stall and/or lateral instability occurs, then the plane goes into a spin or an other unpleasant flight situation and very often crashes.

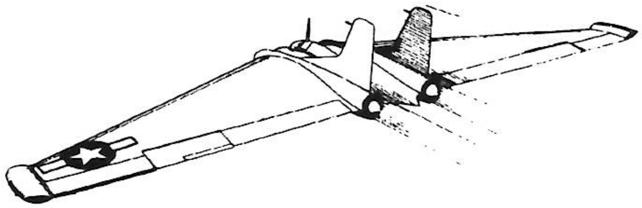
If moving the C.G. back is wrong, what should then he done in such a case? Why, the solution should be obvious to any aeronautical engineer.

When the flying wing in normal flight has the elevons up, then the fixed twist of the wing, the build-in wash out, is too small and should be increased !

But, whenever I suggested this remedy, then invariably came the reply: "Well, but this would deteriorate the performances of the airplane". This is true; but flying with the elevons up deteriorates the performance even more !

But, you know, nobody ever did believe me !!! And so, flying wings again and again have been flying with C.G. aft . . . and crashed.

........From a 1997 Harris Hill Flying Wing Symposium



XP-79, ROCKET-POWERED AIRPLANE

Jack Northrop

In September 1942 we conceived the idea of combining the newly developed liquid-rocker motors with a flying wing in a high speed and highly maneuverable fighter. The physical dimensions of the human frame immediately became a limiting size factor and for this reason, as well as because much higher accelerations can be withstood for longer periods in the prone position, it was decided to place the pilot prone in this design. Three experimental, full-size glider versions of this little airplane were rapidly completed and a long series of glider tests undertaken. In order to achieve the utmost in low drag and light weight, the original airplanes were mounted on skids and the first glider tests were attempted with an automobile tow. Because of the rugged construction of the gliders they had a fairly heavy wing loading and the equipment provided for towing proved to be incapable of achieving enough speed for takeoff.

As a second expedient, detachable dollies were built from which the airplane was expected to take off at flight speeds. Minor crack-ups occurred with this configuration and it was finally decided to compromise the aerodynamic cleanness of these first test airplanes in order to provide a rugged permanent and dependable landing gear for experimental purposes. The unusually large fin used here was required to stabilize the fixed landing gear, a substantial portion of which extended ahead of the C.G. After this gear was installed, and with another airplane as the towing medium, the takeoff difficulties were eliminated and a number of successful glider flights were made.

These airplanes were flown both with and without wingtip slots and slats which were tested for the purpose of eliminating tip-stall difficulties, as will be described later. They were also flown with a wide variation in vertical fin area, to determine the amount necessary or desirable for various flight conditions.

In one memorable test during which the airplane was equipped with a fixed slat, a rather peculiar accident occurred. The pilot, as mentioned before, lay prone within the wing contour. Two escape hatches were located approximately opposite the center of his body, one on the upper surface, the other on the lower surface. The handle which released the escape hatches was located close to the handle which released the towing cable from the tug airplane. At the start of this particular flight, after a successful climb to 10,000 ft., the pilot inadvertently released the escape hatches at the time of his release from tow, and as a result partially fell out of the airplane. The instinctive grasp on the control mechanism resulted in an indescribable wing-over maneuver. When things calmed down the pilot found himself in a steady, uniform glide with the airplane upside down. Minor movement of the controls seemed to produce little effect and the much shaken individual crawled out of the airplane, sat on the leading edge of the center section while he checked his parachute harness, and then slid off to make a perfectly normal parachute descent. The airplane, undisturbed by the change in C. G., continued a long circling flight of the test area and finally landed in a normal continuation of its upside down glide, a short distance from the takeoff point. It was rather seriously damaged but not so much so as to prevent repair. A later check in the wind tunnel indicated that there was a very stable region in inverted flight with this particular slat combination. Later the slats were abandoned as unnecessary and perhaps undesirable.

The airframe was considered suitable for the purpose intended long before the rocket motors had been developed to a degree of reliability considered safe for use, but finally a small motor having about five minutes' duration, was installed and a number of rocket-powered flights were accomplished. The first powered flight occurred in July 1944.

Although the first concept of the XP-79 as this fighter was designated, was as a rocket-powered vehicle (similar in basic idea to the Messerschmitt ME-163), it soon became apparent that the completion of the rocket motors would be far behind schedule and that serious difficulties were attendant to this development. One of the basic concepts for the full-size motor was that the fuel pumps would be driven by rotation of the combustion chambers, which were set at a slight angle to the thrust axis in order to develop torque. It was not foreseen that the rotation of the combustion chambers would have a serious effect on the combustion therein, and this difficulty, never completely solved, caused the abandonment of the particular engine which was being developed for the project.

XP-79B TURBOJET AIRPLANE

As no alternative rocket engine was available, it became necessary to modify the design to incorporate turbojet power plants, and the second of the XP-79 series, called the XP-79B, was completed with two Westinghouse B-19 turbojets and first airborne on September 12, 1945. The takeoff for this flight was normal, and for 15 minutes the airplane was flown in a beautiful demonstration. The pilot indicated mounting confidence by executing more and more maneuvers of a type that would not be expected unless he were thoroughly satisfied with the behavior of the airplane.

After about 15 minutes of flying, the airplane entered what appeared to be a normal slow roll, from which it did not recover. As the rotation about the longitudinal axis continued the nose gradually dropped, and at the time of impact the airplane appeared to be in a steep vertical spin. The pilot endeavored to leave the aircraft but the speed was so high that he was unable to clear it successfully. Unfortunately, there was insufficient evidence to fully determine the cause of the disaster. However, in view of his prone position, a powerful, electrically controlled trim tab had been installed in the lateral controls to relieve the pilot of excessive loads. It is believed that a deliberate slow roll may have been attempted (as the pilot had previously slow rolled and looped other flying-wing aircraft developed by the company) and that during this maneuver something failed in the lateral controls in such a way that the pilot was overpowered by the electrical trim mechanism.

ALL-WING BUZZ BOMBS

Several other all-wing aircraft and variations of them were built and tested during the same period. Shortly after the advent of the V-1 an all-wing "buzz" bomb was designed and built. This airplane housed the German V-1 resonator in a duct in the center of the wing and carried twice the German warhead in cast wing sections on each side of the power plant with fuel in the outer wings. Several were built and flown successfully.

The first of these buzz bombs was tested as a pilot-controlled glider with good success. It was very small and incorporated a number of extra bumps which were originally conceived to be the best way to carry standard 2,000 lb. demolition bombs. In spite of its peculiar configuration, which departed appreciably from the all-wing ideal, it had quite good flight characteristics, was flown on a number of occasions (the airplane was successfully slow-rolled) and demonstrated the suitability of the type for the purpose intended.

The one difficulty experienced in this series of tests is worthy of note. The piloted version of the buzz bomb naturally required some type of landing gear for takeoff and landing, and in this case we employed tiny, low-pressure air wheels, rigidly mounted in the airframe structure and extending only a few inches below the contour of the aerofoil or, more specifically, the bomb-shaped bumps thereon. Landing on this gear involved bringing the airplane in at an altitude of approximately 15 percent to 20 percent of the mean aerodynamic chord just prior to contact, and no amount of practice on the part of the pilot produced a technique satisfactory for this purpose. In every case a change in airflow appeared to develop as the airplane approached within a quarter-chord length of the ground. The drag was apparently reduced, the lift increased and the airplane rose, in spite of anything the pilot could do, to a height of 8 or 10 ft. above the ground, at which point it stalled and flopped down out of control. This maneuver resulted in a number of rough landings but no damage to either the pilot or the airplane. It was later found that the only way to make any sort of smooth landing was to bring the airplane in at comparatively high speed and actually fly it onto the ground. This difficulty was not experienced in airplanes having normal landing height above the ground, such as the N-9M and XB-35.

This article is from the 35th
Wright Brothers Memorial Lecture by Jack Northrop.

PHOTOS Page 23

9. A few photos from Bob Marchese of the FAC Non-Nats at Geneseo in July. Doug Griggs on the left and Bob Marchese were one and two in the Guillow's Fairchild 24 event. Congratulations!!

10. Dave Rees snapped launching his WWI Martinsyde Elephant at Geneseo, OSS at Muncie.

11. David Livesay a prolific producer of rubber powered aircraft seen here with his Wildcat.

12. Another David, this time David Franks showing his Seversky from Tom Nallen plans.

13. A great flight shot of Joe Barish's electric Power Scale Republic Seabee at Geneseo.

14. From the west Bob Schlosberg sent this photo of his 2X Bostonian, a V-tail Sporster (aka Sweet Patootie).

15. An interesting and challenging scale model; a rubber powered Paulin-Tatin by Steve Marck.

16. John Hunton's electric R/C Brewster Buffalo from the Dumas kit is a spectacular flyer.

17. Scot Dobberfuhl way out in Oregon built his Keith Rider R-6 using an enlarged Dave Livesay plan.

Buzz Bomb Trivia

We had one of these proto-type Buzz Bombs at school when I went to Northrop. An interesting aspect was that it was nearly of all welded Magnesium construction. A ship load of them was rumored to have been dumped into the Pacific after the surrender of Japan. Those alka-seltzer tablets would not have lasted too long in the briny.

Old Model Articles

As usual, I have tried to keep the flavor of the original articles, which were scanned and translated in to digital text. Since the font size of the originals was so small the font has been resized to 10 and put in a double column format. Some of the pictures just were too marginal to use here, however all text is included. The plans have also been scanned and cleaned up.

Stew

9
Photo from Bob Marchese

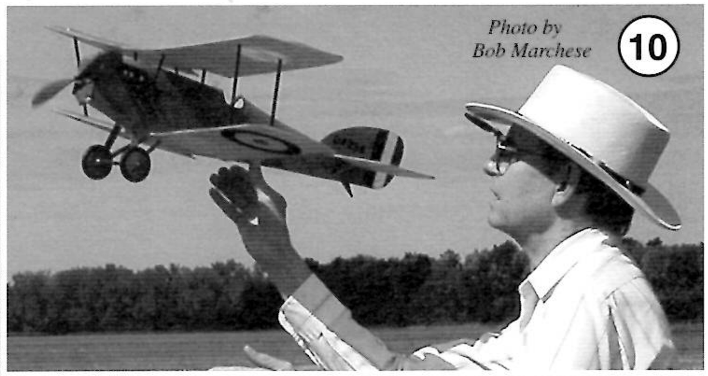

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Photo by Bob Marchese

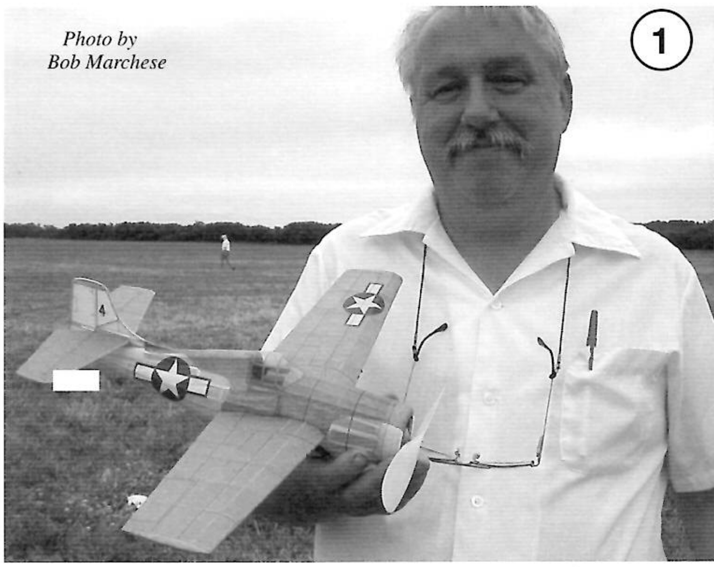

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Photo by Bob Marchese

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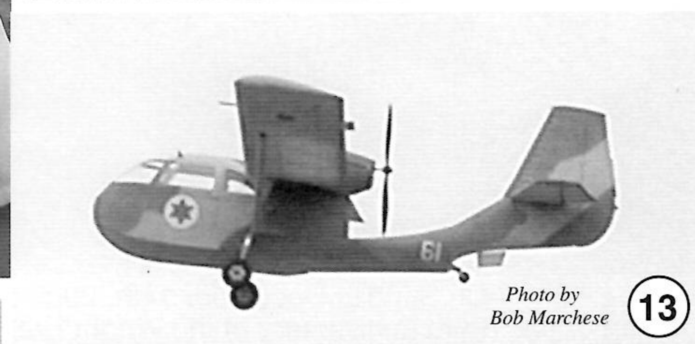
Photo by Bob Marchese



13
Photo by Bob Marchese


14
Photo by Bob Schlosberg


15
Photo by Steve Marck

16
Photo by John Hunton

17
Photo by Scot Dobberfuhl

On Sunday December 14th, 2003 the Maxecuters will commemorate the 100th anniversary of the Wright Brothers first Flight at Shangri-la (Comsat).
Any rubber powered model of WWI or before is eligible to participate.
Flying will commence about 3:00 PM and continue until dark or everyone is hungry

Important: Please park on the road by the Post Office!!

Photo by Bob Marchese at FAC Geneseo
Jack Kacian and his Wright Flyer

Jack Dennis' Wright Flyer
(R/C Dare Kit)

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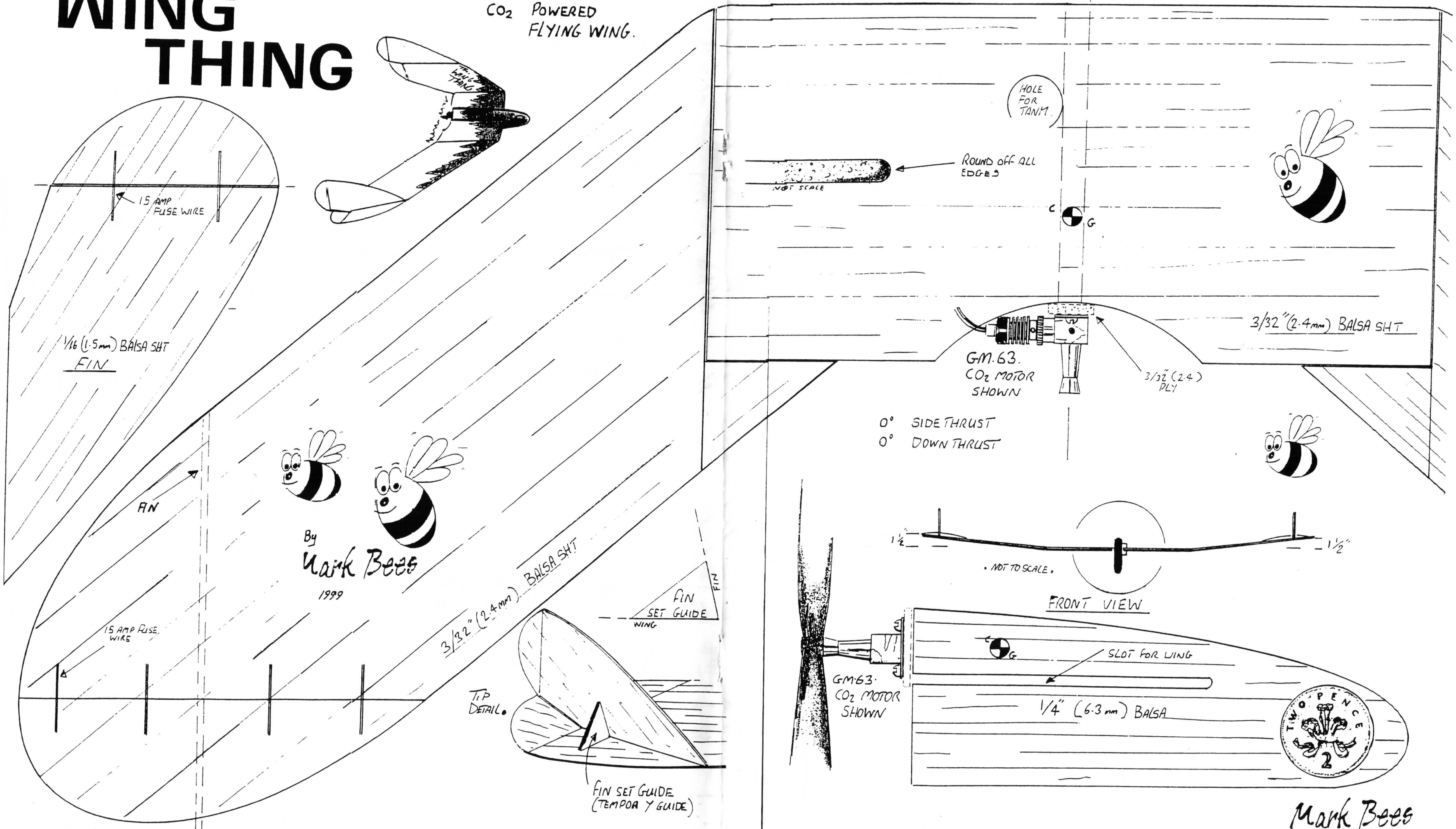
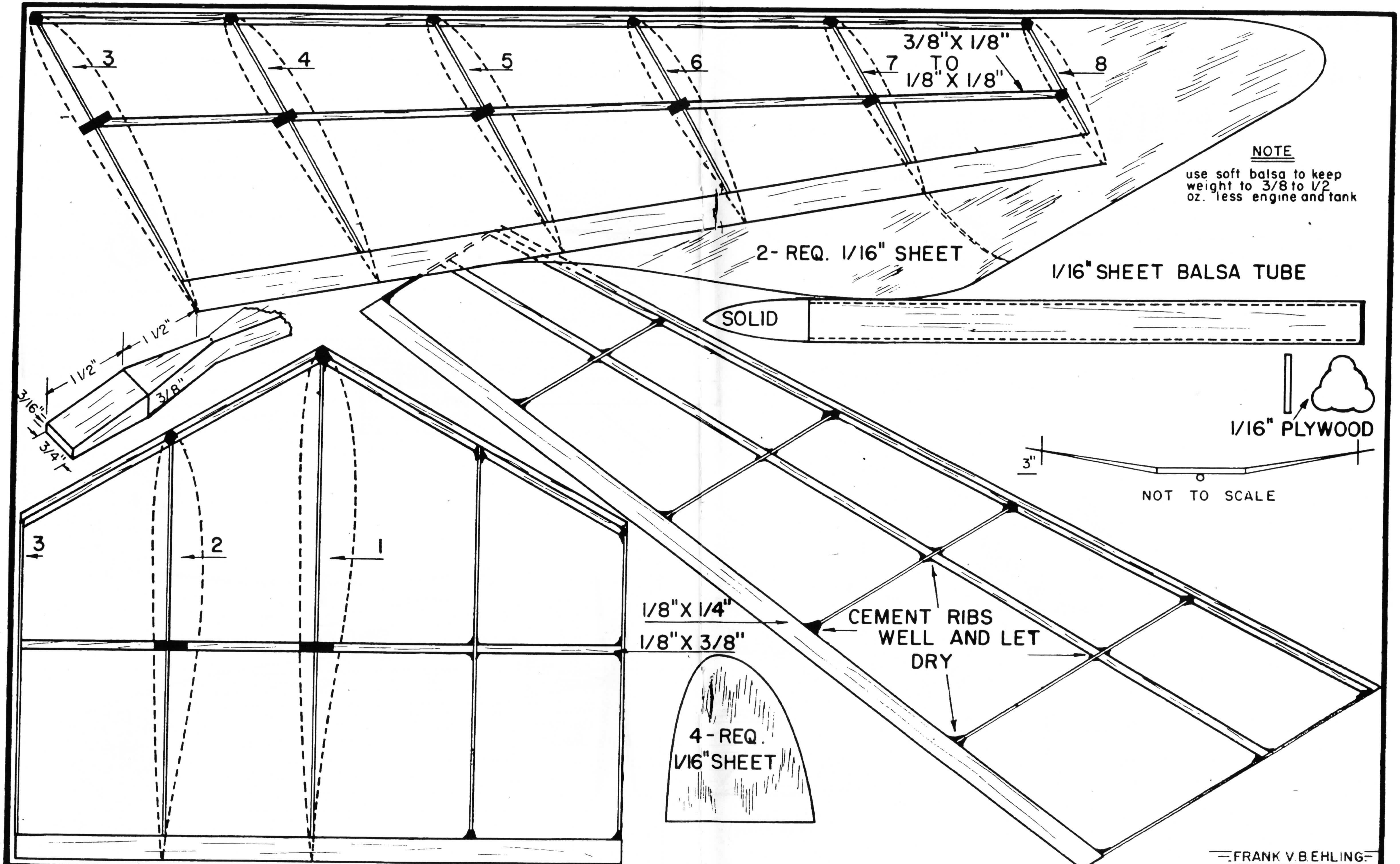
Editor: Stew Meyers, 8304 Whitman Dr., Bethesda, MD 20817
MEETINGS - The D.C. MAXECUTERS hold meetings at 8:00 pm on the first Tuesday of every month at the College Park Airport, the oldest continuously operating airport in the world.
MEMBERSHIP - Dues for membership in the D.C. MAXECUTERS are $15 per year for residents of the USA, Canada, and Mexico, and $25 for all other countries.
Your mailing label indicates the year and month of the last issue of your current membership. A red "X" in the box below is a reminder that your dues are due. Send a check, payable to the"D.C. MAXECUTERS", to the treasurer, Norm Davison.
PUBLISHING DATES - Six issues of MaxFax are sent each year as close to the nominal dates as possible, but since this is a volunteer publication nothing is guaranteed except that six issues will be sent to all members.
CONTACTS - Material for the newsletter and membership questions should be addressed to Stew Meyers phone 301-365-1749. Email gets immediate attention. stew.meyers@erols.com

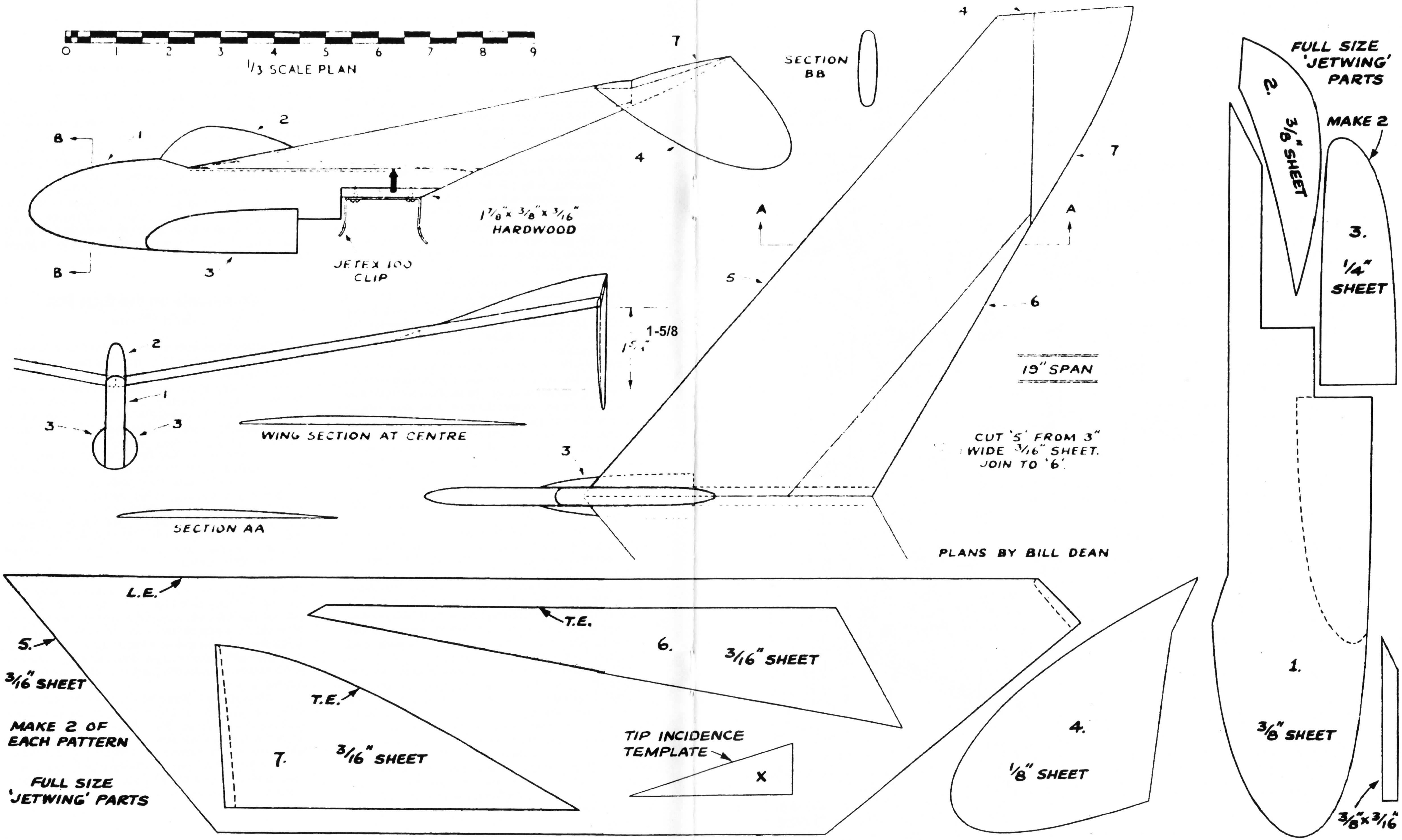
Maxecuter web site: www.maxecuter.com

Your DUES are due

THE WING THING




3
4
5
6
7
8
3/8" X 1/8" TO 1/8" X 1/8"
NOTE
use soft balsa to keep weight to 3/8 to 1/2 oz. less engine and tank
2- REQ. 1/16" SHEET
1/16" SHEET BALSA TUBE
SOLID
1 1/2"
1 1/2"
3/8"
3/16"
3/4"
1/16" PLYWOOD
3"
NOT TO SCALE
3
2
1
1/8" X 1/4"
1/8" X 3/8"
CEMENT RIBS WELL AND LET DRY
4 - REQ. 1/16" SHEET
FRANK V. B. EHLING



1/3 SCALE PLAN
0 1 2 3 4 5 6 7 8 9
1⅞" x 3/8" x 3/16" HARDWOOD
JETEX 100 CLIP
WING SECTION AT CENTRE
SECTION AA
SECTION BB
1-5/8
19" SPAN
CUT '5' FROM 3" WIDE 3/16" SHEET. JOIN TO '6'.
PLANS BY BILL DEAN
L.E.
T.E.
5.
3/16" SHEET
6.
3/16" SHEET
7.
3/16" SHEET
TIP INCIDENCE TEMPLATE
X
MAKE 2 OF EACH PATTERN
FULL SIZE 'JETWING' PARTS
4.
1/8" SHEET
FULL SIZE 'JETWING' PARTS
2.
3/8" SHEET
MAKE 2
3.
1/4" SHEET
1.
3/8" SHEET
3/8" x 3/16"