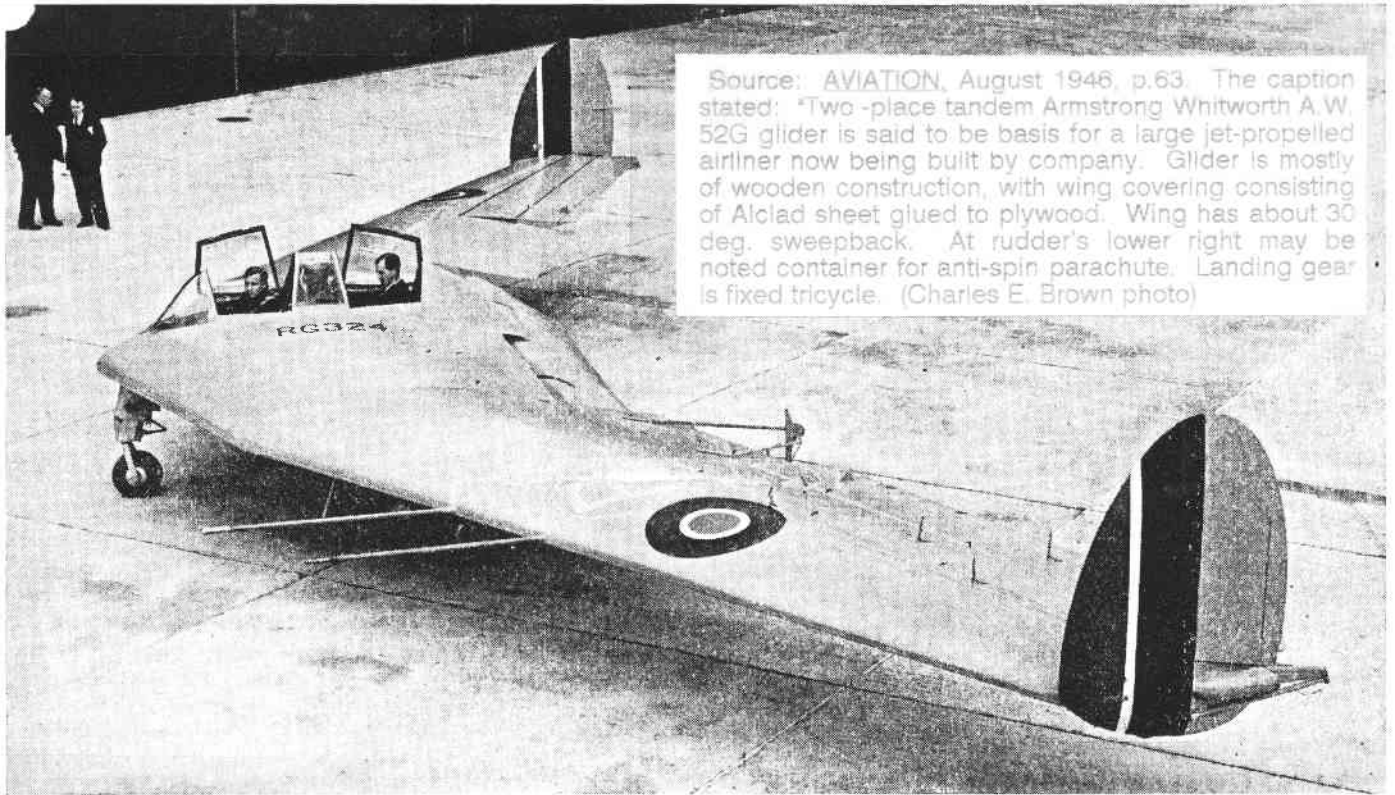


## T.W.I.T.T. NEWSLETTER



Source: AVIATION, August 1946, p.63. The caption stated: "Two -place tandem Armstrong Whitworth A.W. 52G glider is said to be basis for a large jet-propelled airliner now being built by company. Glider is mostly of wooden construction, with wing covering consisting of Alclad sheet glued to plywood. Wing has about 30 deg. sweepback. At rudder's lower right may be noted container for anti-spin parachute. Landing gear is fixed tricycle. (Charles E. Brown photo)"

**T.W.I.T.T.**  
 (The Wing Is The Thing)  
 P. O. Box 20430  
 El Cajon, CA 92021



The number to the right of your name indicates the last issue of your current subscription, e.g., **9209** means this is your last issue unless renewed.

Next TWITT meeting: Saturday, September 19, 1992 beginning at 1330 hrs at hanger A-4, Gillespie Field, El Cajon, Calif. (First hanger row on Joe Crosson Drive - East side of Gillespie.)

**THE WING IS  
THE THING  
(T.W.I.T.T.)**

**T.W.I.T.T.** is a non-profit organization whose membership seeks to promote the research and development of flying wings and other types of tailless aircraft by providing a forum for the exchange of ideas and experiences on an international basis. T.W.I.T.T. is an affiliate of The Hunsaker Foundation which is dedicated to furthering education and research in a variety of disciplines.

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 Vice Pres., Dave Pio (619) 789-1650  
 Secretary, Phillip Burgers (619) 563-5465  
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Editor (Acting), Andy Kecskes

The **T.W.I.T.T.** office is located at Hanger A-4, Gillespie Field, El Cajon, California.

**Mailing address:** P.O. Box 20430  
 El Cajon, CA 92021  
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Meetings are held on the third Saturday of each month, at 1:30 PM, at Hanger A-4, Gillespie Field, El Cajon, California (first row of hangers on the south end of Joe Crosson Drive, east side of Gillespie).

**PRESIDENT'S CORNER**



This month you will find the newsletter contains a little more in the way of visual material. This is partly due to its availability, but mostly due to the lack of very much mail. I know some of you would prefer this type of information over Letters to the Editor, so

this issue is especially for you.

One of the things that was discussed at the August meeting was the cost of producing the newsletter. The printer has raised the copying rate, plus getting it laser printed adds to the monthly cost. So far this is staying within the \$15 annual subscription rate, but the financial pad is rapidly disappearing. We don't anticipate a rate increase in the near future for domestic mailings, however, the foreign rate may have to go up to absorb more of the postage costs. We will keep you informed on this.

Something that would help keep costs under control would be a laser printer of our own. We are asking if anyone knows of an HP Laser printer that could be donated to TWITT. We are not looking for the latest model, simply one that is functional and will be discarded or traded-in on a newer model. We would be willing to help with any shipping costs if it must come from somewhere outside of Southern California. We would appreciate your help, and don't forget THE DONATION IS TAX DEDUCTIBLE.

I hope some of you had a chance to attend the Western SHA Workshop at Tehachapi over the Labor Day weekend. Hopefully, we will be able to get Bruce Carmichael to give us a synoptic overview of it at the October meeting. He was the program organizer this year and had lined up some very good speakers.

For those of you in So. California, if you know of anyone in the aviation world who would make a good speaker for the group, please let us know. Preferably, we would like you make sure the person is willing to give a short presentation of a Saturday afternoon in San Diego. We might even consider having a meeting in the Los Angeles area if it would facilitate getting a very good speaker. Give it some thought, and then take some action.

That's about all there is for this month.

Andy

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## SEPTEMBER'S PROGRAM

Phillip has a very interesting speaker for us this month. **Laura Healy, an aerospace engineer currently employed by Hughes**, will give a short presentation on her experiences in wind tunnel testing. This will include fundamentals of wind tunnel theory, types of testing and facilities, models and support systems, and the current role of wind tunnel testing in the aerospace industry. Her talk will be supplemented with photographs and a brief video, which demonstrates dynamic testing.

At Hughes, she is assigned to implement process improvements for the Tomahawk Cruise Missile Program. She was a test engineer at the General Dynamics Low-Speed Wind Tunnel for eight years, and has worked at several NASA, Air Force and Boeing wing tunnels. Her work on the Atlas program, and at GD's Cryogenic Test Facility has included aerodynamic, pyrotechnical, structural and vibration testing. She has a bachelor's degree in Aeronautical/Astronautical Engineering from the Univ. of Washington, and a master's degree in Aerospace Systems from West Coast Univ.

**This sounds like one of those programs you simply just don't want to miss.**

## MINUTES OF THE AUGUST 15, 1992 MEETING



Andy opened the meeting by announcing the program and explaining this month's raffle prizes. He also briefly talked about the recent rise in printing costs that may mean an increase in foreign dues sometime

in the future.

The version of "The Wing Will Fly" that Bob Cardenas gave us as part of his presentation is an unedited version with his full comments. The TV version cut about 5-10 minutes out of his part to fit it into the 1 hour format. (If anyone is interested in viewing it, send us a blank VHS tape and a few bucks for postage, and we will copy it for you.)

Budd Love got up to make a few comments on wanting the HIAM project to be more than a one-man effort. His is still soliciting the help of anyone who would be willing to contribute some time and effort in furthering this new concept in short takeoff propulsion.

Bruce made a brief announcement about the SHA Workshop to be held in Tehachapi over Labor Day weekend. There will be some interesting projects on display at the airfield, along with several seminars at a local high school.

Phil Prohett's presentation was preceded with a short video of a Commanche experiencing

severe horizontal tail flutter. It was quite dramatic whether viewed at normal speed or in slow motion.

Phil then took the floor to talk about performing various kinds of flutter tests while working for Convair. He began by explaining a little about how he came to find himself at Convair after the war when the Ryan flying school was shut down. He had just finished getting an instrument rating for flying with Convair's airline to Australia, when he was asked by Art Bussy to be his regular copilot in the Flight Research section. That relationship turned into a permanent job for the next 25 years.

His first experience with flutter was with an early model Waco where a reduction in power set up a vibration in the engine that was in synch with the natural frequency of the wings. This condition caused some aircraft to shed their wings, with the solution being to change lord mounts eliminating the frequency.

There are several types of flutter that can be encountered. One is high speed buzz on an aileron. Something like this can be fixed through counter balances.

Phil's first experience with wing flutter at Convair came with the XB-46 program. This was a four engine jet aircraft with a straight wing. Lateral control of the plane was through an 8' guide aileron on each side for some feel, and then 3 large spoilers made of boiler plate that popped straight up out of the wing.

The test involved bringing the plane out of a steep bank with the spoilers, and upon reaching level flight quickly dropping the spoilers back into the wing. This was done at progressively higher speeds until the flutter was generated. The wing ended up moving through a 12' arc, 9' up and 3' down, at 2 cycles per second. Slowing down was the only way to stop it, which took a little time since jets don't slow down as quickly as reciprocal engine aircraft.

It turned out that the natural frequency of the spoilers was the same as that of the wing, so once the spoilers were excited the movement was passed onto the wing. The problem was cured by putting in a declutching system so all the spoilers were available for takeoff and landing, but only the guide ailerons available for regular flight operations.

At one point Convair lost its experimental flying boat, the XP-5Y, due to what the test pilot called a shrug in the tail. This caused a complete loss of control over the horizontal tail, causing the aircraft to go into an ever increasing oscillation. The crew was forced to bail out, and the plane crashed.

The weight saving program that went on as part of the 880 airliner's development, resulted in on two viscous dampers on the rudder. The flight program was trying to achieve a test point out in the area where the changeover from mach number to indicated airspeed occurs. Just prior to reaching the point the chase pilot noticed the vertical tail start to bend over and twist. In the time it

took to reach down for his microphone to tell the test pilot, most of the vertical assembly left the 880. This turned out to be a life saver, since the telemetry indicated the horizontal tail was also building towards failure, but the energy was released through the vertical's separation.

The ground telemetry showed about 3 seconds of trace, building to a saturated trace, and then the tail was gone. They managed to land it on a lake bed through use of differential power for directional control, but with a speed of something over 200 mph.

The problem was solved this time by adding a third viscous damper, which was really needed.

The 990 airliner had a problem with a loss of dampening effect in the pitching moment at around 350 mph. The oscillations would continue in what the test equipment showed as a constant state, and the crew could feel was not self correcting. Convair's dynamicist indicated the dampening effect would improve at around 400 mph, but no one was willing to go out and test the theory.

A team of dynamicists was brought in from throughout Convair to tackle the problem. They all came up with the same answer, so the outboard engines were moved back towards the wing by about 29". As it turned out, the forward position of the engine pods was setting up an oscillating frequency within the wing that was preventing the dampening effects. Movement of the pods actually produced over twice the expected dampening.

There was a general discussion between the members and Phil about provisions that had been made for the aircrew to evacuate the aircraft if there was a catastrophic failure. The 990 test aircraft had a special escape chute out through the bottom of the plane. But there were a number of companies during that era that did not make provisions, and did not provide parachutes since it was decided most failures that would require bailing out would also prevent that action.

The Convair Sea Dart crashed from the oscillations from an unstable hydraulic system rather than pure flutter. The new aircraft were starting to us hydraulic control systems rather than a mechanical linkage to the control surface. When pitch oscillations began the only way to stop it was to let go of the stick, however, a pilot is reluctant to do this when close to the ground. Attempting to fight it only makes it worse since the pilot will always be a half a cycle behind.

The prototype Charger counter insurgency aircraft had a problem with tail flutter. The vibration had gotten so bad it had almost completely sheared through one of the twin tail booms. The problem was solved by putting mass weight counter balances on the tips of the elevator.

The incipient flutter encountered in the turbo prop conversion of the 240 and 340 Convair Liners was also solved in the same manner, i.e., counter balances on the tips.

Phil finished with a quick tale of a DC-8 that years ago had all four engines quit when the power was pulled back at altitude. The pilots were able to get them started before having to deadstick it into a nearby airport. Douglas checked the airplane out, couldn't find a problem and released it. Shortly after returning to service the four engine failure occurred again. It turns out that all four fuel control units had not been put through a retrofit program that would prevent them from fuel starving the engine at high altitudes. Talk about coincidences. Supposedly the individual controls had been missed during the retrofit, but Phil's supposition was more like the airplane was missed, no doubt!

Rich Trafton then took the floor to briefly explain a little about his Teeny Two. He started the project because it looked simple, but as he got into it it began to look kind of ugly. He fixed most of these ugly factors as he went along. It flies about 120 mph on a VW engine, with an open cockpit. Its all metal construction, with a constant chord wing, and carries 9 gallons of fuel. It is true to its name in that only a smaller person can easily fit in the cockpit.

Before everyone broke to go look at the Teeny, Andy conducted the raffle. The first winner was Johnny Parker, a guest who became a member, who took the stack of the first 3 years of TWITT newsletters. Bob then won the 100' of Buffalo Rope that can be used for tie downs, and Jerry Blumenthal took home a TWITT hat.

With the raffle done, the meeting was adjourned.

---

## LETTERS TO THE EDITOR

8/26/92

TWITT



Thanks for the Fauvel info - this is a design I followed over the years and almost ordered plans for about 20 years ago. Fred Jukich built one - his account of the building time offset the apparent simplicity of the design. It also seemed vulnerable to ground looping upon landing. Anyhow, I'm still toying with variations of the AV-60 powered version - 1/2 VW engine - increased wing span - slightly lengthened fuselage for better weight distribution and rudder moments.

Thanks again,  
Alex Rogers

*(Ed. Note: Alex is referring to some Fauvel material added to the TWITT library a while back. Some of it is on the full size aircraft*

and some on a scale model of the AV-36.

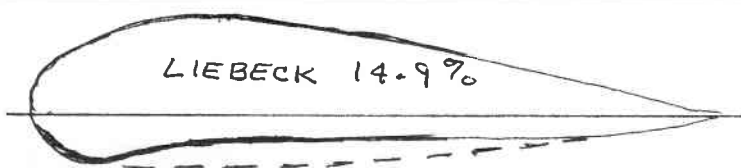
Alex also asked for Tom Blakeney's address so he could inquire about his model wing. For the rest of you Tom can be reached at: 1700 Woodhall Way, Fort Worth, TX 76134, however, he did comment there was no plans to produce drawing of the changes he had made to the Klingberg Wing.)

7/27/92

Hi Bob:

I just returned from the Eastern SHA Workshop - had some good speakers.

A couple of years ago a Mini Bat was for sale - complete & cheap. Now Marske says that the Liebeck airfoil is a dud at low RN. I'm wondering if anybody has tried to modify the section by adding lower surface camber thus getting rid of the lower leading edge protrusion.



Do you have the Liebeck airfoil coordinates in your file? I'm between projects and feel like messing around with the Bat. The other recourse is to build a new wing. It would be simple to fill in the lower portion with foam and glass.

If you have any suggestions about the Mini Bat - feel free. I may just hang it in the rafters!

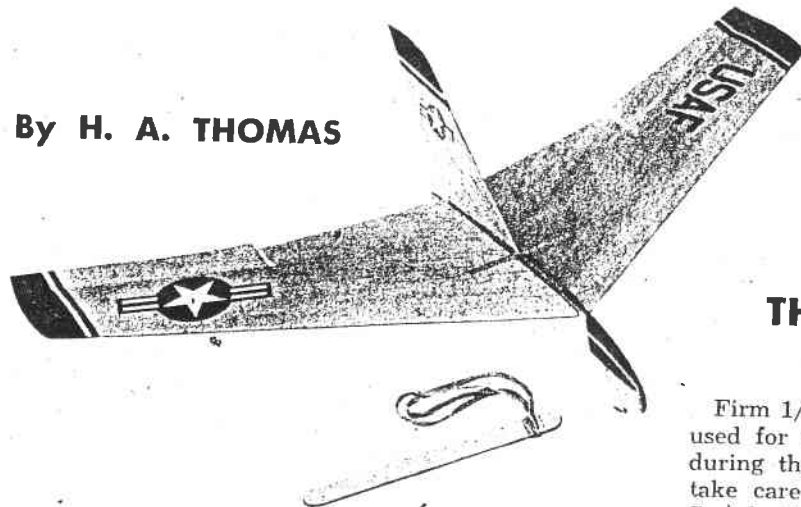
Regards,  
John Karlovich  
Box 1268  
Cartersville, GA 30120

(Ed. Note: We would like to welcome John to TWITT, since he also enclosed dues for a membership.

Bob has asked Bruce Carmichael to pass some information along to John on the Mini Bat, however, maybe Julio Paredes might be able to provide John with some additional insight into what he has learned about the Bat.)

The following item from the March 1954 issue of Air Trails was contributed by Larry Nicholson.

By H. A. THOMAS



# Whizzie

## THE CATAPULTED WONDER

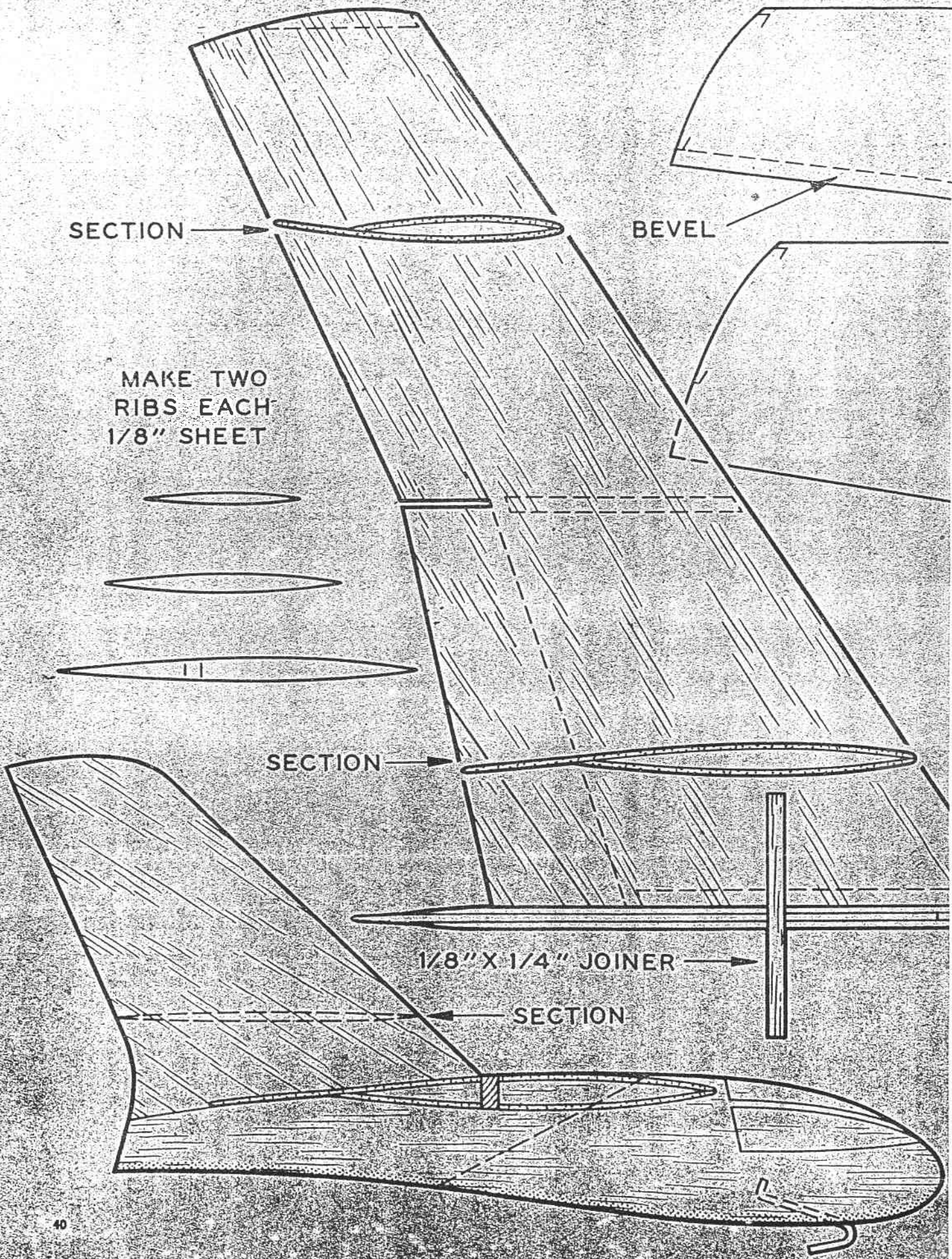
Firm 1/32 inch or fairly soft 1/16 inch sheet can be used for the wing skins. Moisten the outer surfaces during the cementing process and the curvature will take care of itself. Use numerous pins or pieces of Scotch Tape to hold the edge seams together. After drying, the wings can be sanded, doped.

Fit the launching hook into the notch provided for it in the plywood core. Clamp the body parts with clothespins while the cement hardens. The wing panels are assembled about the stub spar, with cement used liberally around the root joints. A final doping and addition of any desired trim completes the model.

Warp tips upward evenly and hand-glide gently. Add clay to nose or tail if necessary. This model has not the slow speed stability of a conventional type, but once adjusted and airborne it will surprise you with its flat, fast glide.

■ Not every modeler is a Dizzy Dean when it comes to tossing a hand-launch glider. But Jim Walker has proved that anybody and everybody can fly a glider with an elastic sling. These models produce more performance for the building effort expended than any other type.

This little flying wing can teach the fundamentals of adjusting this most modern of aircraft layouts. A unique assembly knack provides the transition in incidence which is the all-important stabilizing factor. From a positive root section incidence, the angle becomes negative at the tips.



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SECTION

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SECTION

FIRM 1/32" OR SOFT 1/16" BALSA WING SKINS

UPPER SURFACE  
MAKE TWO

LOWER SURFACE  
MAKE TWO

SPLICE

BEVEL

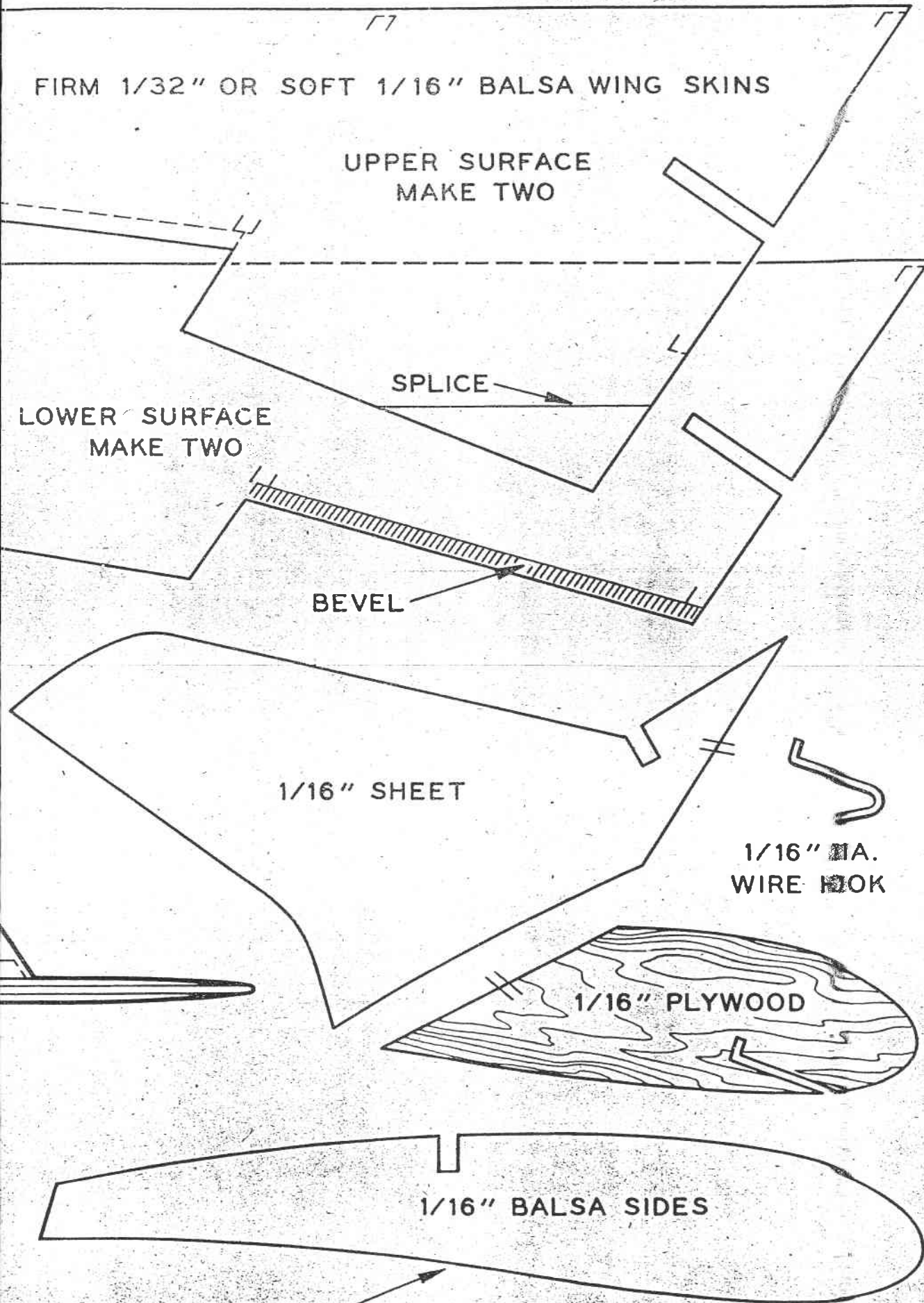
1/16" SHEET

1/16" DIA.  
WIRE HOOK

1/16" PLYWOOD

1/16" BALSA SIDES

MAKE TWO



"ANGEL"

A DESIGN BY HERSCHEL SMITH (circa 1976)

Alex Rogers sent us some correspondence he had with Herschel Smith in 1976 about a number of different things related to gliders and flying wings. Included, was a sketch of the Angel sport sailplane. We have taken some of Herschel's comments from these letters and offer them to you for future thought.

"I will make up a sketch from memory of what the Angel looks like. It is too big a deal to dig out the original drawings. However, I don't exactly see what you mean by "conventional ailerons." If you have a control surface at the trailing edge, far enough out to serve as aileron but not too far out, and the ones on opposite sides move together to serve as elevators and separately to act as ailerons, you got elevons, man - and the linkage isn't complicated. Backstrom worked out a good linkage, using cable, and if you don't like cable (as I don't, very much) a rod equivalent can be developed. Differential action is inherent in that if the stick comes back a bit as you roll in bank, the inner one rises more than the outer one droops. Again, this is simpler than any alternative I know about."

"Also I found that a glider built with a neutral-stability airfoil (little or no reflex) can have an extraordinarily small tail and still have adequate stability. I found this out from a model that had a large, swept-back tapering vertical tail that began just back of the trailing edge of the wing, with the horizontal tail mounted T-fashion on top of it. I kept cutting down the size of this horizontal tail and it was still adequate at about 5% of the wing's area, and a quite short moment arm. This suggests that one can be somewhat daring when experimenting with plank-type tailless gliders, as regards the inherent stability of the section chosen, since, if the section is just a little inadequate in pitch stability, one can salvage the design with a miniature horizontal tail on top of the vertical stabilizer."

"That brings us to Backstrom's planks. I believe you will find that the later versions of the EPB series used a central vertical stabilizer but not a moving vertical rudder. Backstrom just transferred the drag rudder function from the vertical tip rudders to the last bit of the wing's trailing edge, which, being outside the elevons, was available for the purpose. My pitch for this control goes like this: a fuselage-mounted vertical rudder is so short-coupled that it will be oversensitive if it's big enough to yaw the relatively distant tips around. Also, since some form of glide-path control has to be provided, a simpler machine will result if the

glide-path device can also be the steering or yawing means.

"It was Pete Bowers, flying Kasper's sweep-back tailless, I think, who tended to push both pedals down at once: and it's this report that made me think of a detent. The detent would be two bullet-nosed plungers held apart by a strong spring, mounted in a tube between the two "rudder" pedals and riding in two indentations in the sides of the pedals. As soon as either pedal is depressed, the movement of the plunger on that side would increase the spring loading of the other one, making it necessary to override a noticeable resistance to depress the other: thus reminding the pilot not to push them both down at once except when a drag increase is wanted. This system, by the way, would have the minor additional advantage of making a generally, cleaner wing surface than would conventional spoilers."

*(Ed. Note: Thanks to Alex for this material. There was more the letters, but this seemed to most relevant to flying wings for both the full size and model building members.)*

INFORMATION NEEDED


Bob Fronius, TWITT's Founder, along with some other early aviation pioneers in the San Diego area, are trying to get a National Monument established on the soaring sites at Point Loma. He is looking for information and/or pictures of flight activity from the Point Loma area during the period of 1929-30, including any flights of Hawley Bowlus. If you don't have pictures, but were an eye witness and could provide some detailed accounts of the soaring, that would be great. If you can help, contact Bob at home in the evenings, the hanger during the day, or through the TWITT post office box. Thanks for your help.

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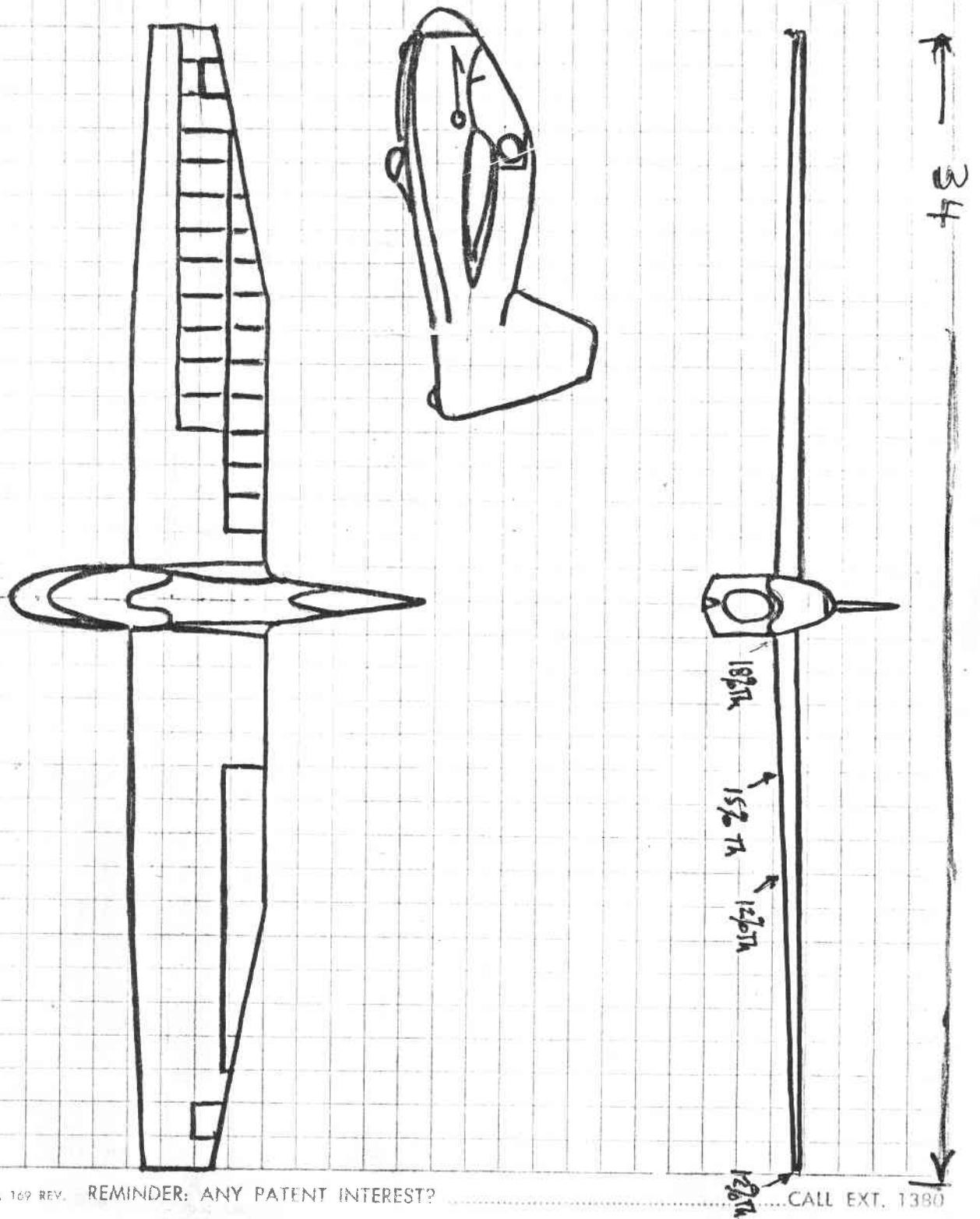
**R/C Soaring Digest**  
 P.O. Box 2108  
 Wylie, TX  
 75098-2108





By Hershey Smith

Prepared			SIKORSKY AIRCRAFT		Page	1 of 1
Checked			TITLE "Angel" - 34' span plank-type Sport Sailplane		Model	
Drawing	HS	5/12/76			Report No	



**AVAILABLE PLANS & REFERENCE MATERIAL**



**Tailless Aircraft Bibliography**

by Serge Krauss  
Cost: \$20  
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Tailless Tail, by Dr. Ing. Ferdinando Gale'. Consists of 268 pages filled with line drawings, tables and a corresponding English text. It is directed towards modelers, but contains information suitable for amateur full size builders.

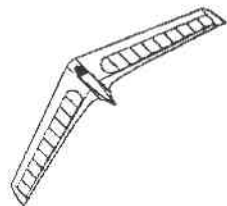
Published by B<sup>2</sup> Streamlines, P.O. Box 976, Olalla, WA 98359-0976, or (206) 857-7249 after 4pm Pacific Time. Price is \$38, postage and handling included (also applies to Canada and Mexico). Orders shipped elsewhere will be sent surface mail unless an additional \$10 is included to cover air mail postage. Washington residents must add 7.5% sales tax.

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**MODEL WINGS**



The cover of the July 1991 issue of RCModeler features a flying wing called the "Stealthbat" offered by Wing Manufacturer. There was no price listed, but they can be contacted at:

306 E. Simmons  
Galesburg IL 61401  
(309) 342-3009  
Catalog: \$4.00

**Tower Hobbies** carries the Future Flight Klingberg Wing kit for \$39.99 (item #TE1130) and the Klingberg Wing 100 for \$149.99 (item #TE1131). They can be contacted at:

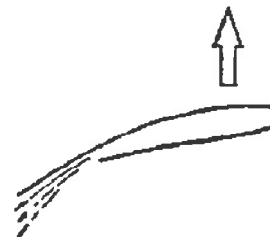
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Make checks payable to: Sailplane Homebuilders Association, & mail to Secretary-Treasurer, 545 McCarty Drive, Furlong, PA 18925.



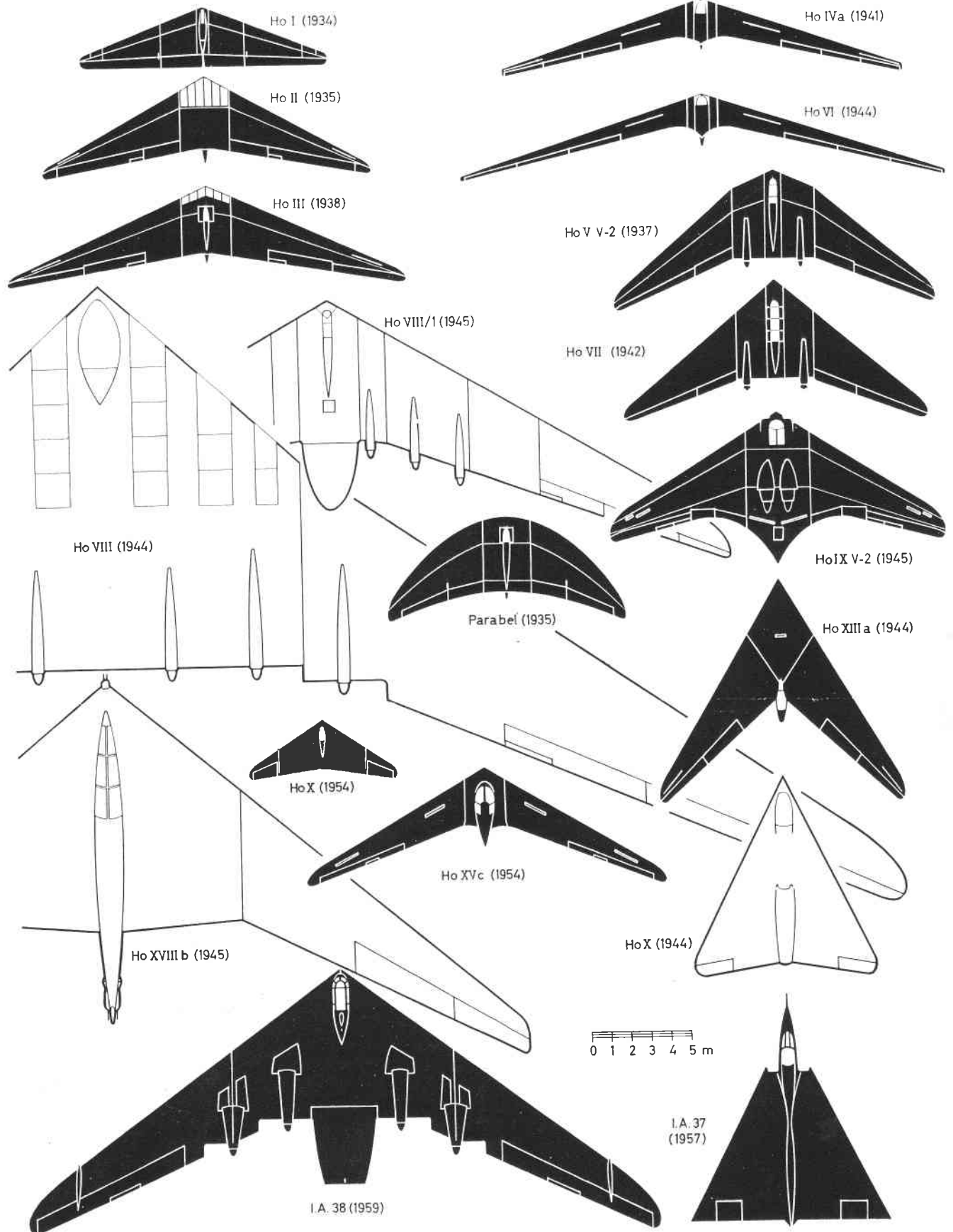
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For those of you who would be interested in assisting Budd Love with some aspect of his High Internal Air Mass (HIAM) project, he would be glad to hear from you. This concept has great potential for the future of air transportation.

Contact: AIRLOVE, LTD.  
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La Jolla CA 92037  
(619) 459-1489

This page of Horten designs came from an unknown German article included in Bruce

Carmichael's collection of letters and other material on loan to TWITT.



Held in conjunction with SCIF Fall "Texaco" class contest

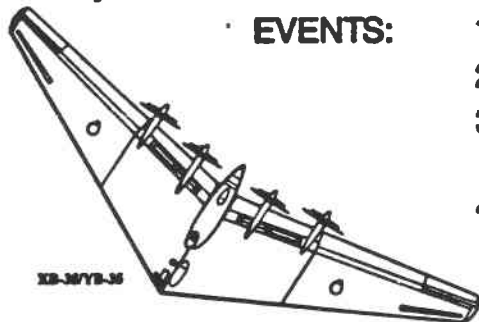
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YB-49

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*Scale & Flight Judge*  
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