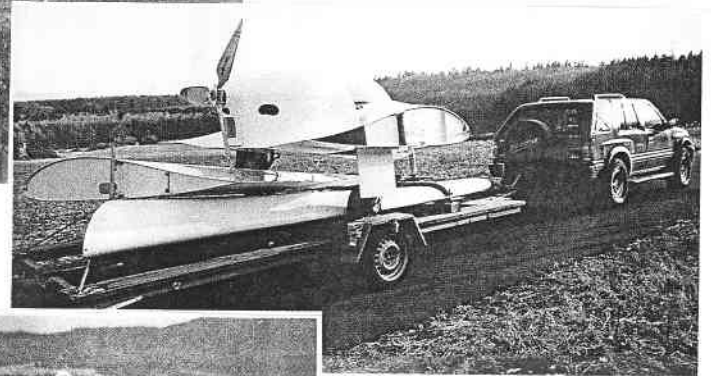
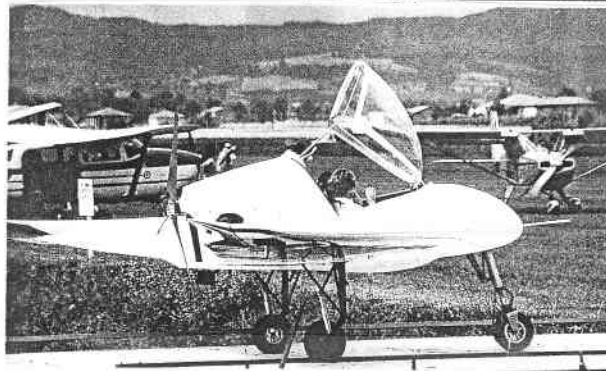


T.W.I.T.T. NEWSLETTER

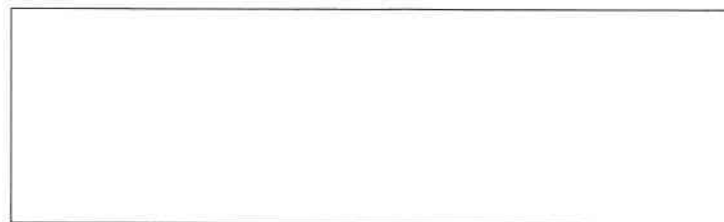


Clippings from the PUL-10 sales brochure sent to us by Philippe Vigneron, all the way from Saudi Arabia. Note the convenient way it stacks on a normal width trailer. Depending on the ease of assembly it looks like you could take it home at night and save the expense of a hanger or tie down space.



T.W.I.T.T.

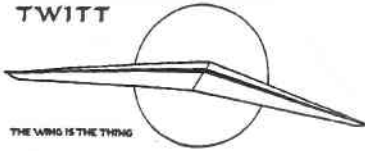
The Wing Is The Thing
P.O. Box 20430
El Cajon, CA 92021



The number to the right of your name indicates the last issue of your current subscription, e.g., **9604** means this is your last issue unless renewed.

Next TWITT meeting: Saturday, May 18, 1996, beginning at 1330 hrs at hanger A-4, Gillespie Field, El Cajon, CA (first hanger row on Joe Crosson Drive - East side of Gillespie).

TWITT



**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 tailless aircraft by providing a forum for the exchange of ideas and experiences on an international basis. T.W.I.T.T. is affiliated with The Hunsaker Foundation which is dedicated to furthering education and research in a variety of disciplines.

T.W.I.T.T. Officers:

President: Andy Kecskes (619) 589-1898
 Vice Pres: Bob Chase (818) 336-5485
 Secretary: Phillip Burgers (619) 563-5465
 Treasurer: Bob Fronius (619) 224-1497
 Editor: 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

(619) 596-2518 (10am-5:30pm, PST)
 (619) 224-1497 (after 7pm, PST)
 E-Mail: NBKP63A@prodigy.com

Subscription Rates: \$18 per year (US)
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Information Packages: \$2.50 (\$3 foreign)
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Meetings are held on the third Saturday of every other month (beginning with January), 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).

TABLE OF CONTENTS

President's Corner1
 This Month's Program2
 Meeting Minutes2
 Letters to the Editor3
 Available Plans/Reference Material7
 Flying Wing Sales9

PRESIDENT'S CORNER

As you can see from the minutes the program we thought we had didn't happen, but I'm sure everyone had a good time talking about their pet subjects with other members.

I recently attended a conference for internal auditors (which is what I do when I'm not working on the newsletter) and got to talking with a gentleman who is associated with the Northrop-Lockheed credit union in Los Angeles. Of course I mentioned TWITT and explained what we are all about. He then proceeded to tell me we should get Max Stanley, one of the YB-49 test pilots, to come down and talk with us. I said it would be great but we didn't have any way of contacting him. To make a long story short, we exchanged business cards and he said he would try to get a hold of Max Stanley and see what could be arranged. I'm keeping my fingers crossed.

At the time I typed this piece I wasn't sure what the newsletter would look like this month. I have had to switch to Microsoft Word and it is not as easy to work with in some areas of the newsletter's publication format. So by the time it comes off the printer I will be as surprised as you. It will take several months to find the right combination of things that work well and look good.

I would appreciate your feedback as we proceed with the newsletter over the next couple of months. If you find certain type styles and sizes that are easier to read, or a layout you think shows off some aspect of an aircraft better than another, please let me know with a call or a letter.

For those of you on the east coast, it doesn't look like you are quite ready to come out of the winter doldrums. But here on the west coast the temperatures are just right to working with those composites, fabrics and dopes, so I expect to start seeing some pictures and stories of what is about to make it into the air, be it a model or full size aircraft.

Until next month, may the flying all be great and most of all safe.



MAY 18, 1996 PROGRAM

s of publication date we still didn't have a line on a program for May. I would like to make it a good one to end our 10th year with a bang. Bob is working on it as this is hitting the presses, plus I think we have at least one fallback option, if necessary. If you know of anyone who would fit the bill for this type of program, be sure to call us with the details, name, phone number, etc., so we can try to make the arrangements.



MINUTES OF THE MARCH 16, 1996 MEETING

Well the meeting that wasn't a meeting got underway at about 2:15 to announce that your speaker, William Brader, for the day was a no-show. (Phillip Burgers contacted him later and found he had some type of medical or dental problem that prevented him from coming.)

The program was supposed to be about his extensive collection of unmanned drone aircraft which he maintains at Montgomery Field here in San Diego. He has managed to get his hands on every model of drone that Beechcraft ever built. He was going to bring some pieces of these drones for discussion about aerodynamics, etc.

It was decided that since Bob Chase brought down a small collection of ultralight engines and had them on display we would make that the program for the day. Andy also mentioned that Bob had been recognized as an ultralight pioneer by the U.S. Ultralight Association at their recent 10th annual convention in Las Vegas.

Bruce Carmichael announced he had reached the breakeven point on his book, so it means sales have been going well for this venture. He also commented on the upcoming Vintage Sailplane Association's Memorial Day get together which will be at Tehachapi instead of Hemet.

It was also announced that June Wiberg, our keeper of the books, rolodex, coffee makings and many, many other things, had been elected as the West Coast Vice President of the Sailplane Homebuilders Association.

Andy then turned the floor over to Bob Fronius who would tell the group a little bit about the history of Hawley Bowlus in San Diego as a lead-in to some information on the upcoming ceremony at Point Loma. It is sponsored by the Hunsaker Foundation, Environmental Trust and other aviation enthusiasts, and has been approved by the National Soaring Museum.

This will be a dedication of a new plaque to be added to the existing stone honoring the contributions of early aviators who used Point Loma as a launching point, including Charles Lindberg and Bowlus. There should be fly-over by several vintage aircraft, as well as some radio

controlled vintage style sailplanes. The possibility of a banquet later in the afternoon was still under consideration. The ceremony will be held on April 27 at 11:00 am, and if your interested in attending please call Bob at the numbers on page 1 for more information on exact time and directions.

Bob Chase took the floor to tell us about a recent visit he had with Les King at Tehachapi who is starting a new ultralight sailplane project. The aircraft has a similar planform to Jerry Blumenthal's Rattler. Its basic configuration is an elongated plank with a fuselage section built on top. Material cost are about \$1,800. Les also indicated that once it was built and flying he would bring it down to a meeting and give us a talk.

Bob went on to tell us about his recent find of a Sun Seeker owned by a man in Northern California. Originally built in 1983-84, the cost of about \$8,500 made them less than a commercial success.

It cruises at about 58 mph on a Rotax 277 27 hp engine, has 700 fpm rate of climb, and 126 sq. ft. of wing area. The spar is wood with a Stits fabric covering, flaps, and aluminum covered ailerons. The tail feathers are also aluminum at the end of an aluminum tail boom. This type of construction makes for a lower drag component than other ultralights which accounts for some of its ability to cruise at normal speeds on less horsepower. However, this is what probably drove the cost up to the point it wasn't affordable by a majority of the ultralight flying community.

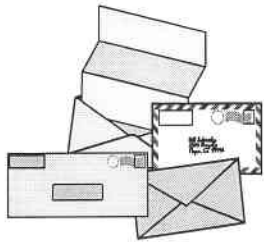
This intrigued Bob so he went up to have a look at it as a possible method of getting airborne while he works on his other ultralight project. He was sufficiently impressed to the point where he is now trying to find one that may be for sale.

Someone from the audience mentioned that two of the engineers working on the Lancair are developing a carbon fiber based sailplane that willan all up gross weigh of about 500#. He didn't have a lot of details other than it will have a high aspect ratio wing and performance of about 30:1.

Bob went on to prophesize about the future of flying wing ultralights in the years ahead, especially as the cost of carbon fiber construction comes down. He is also looking for a reliable engine of about 20 hp to propel such a machine, and thinks he may have found it in a Briggs & Stratten utility engine. He will let us know what he finds later.

With that we adjourned to the "engine table" and everyone enjoyed some good ole fashioned hanger flying.

LETTERS TO THE EDITOR



March, '96

TWITT:

ets start a fire. Ok, I'm going to renew again. About half of TWITT's members are also members of Sailplane Homebuilders Association.

In the December '94 issue of SHA Newsletter our (esteemed) member Bruce Carmichael reprinted a 1961 proposal by P.B.S. Lissamen titled "A Proposal for a Minimum Weight Glider." Glider details were quite simple; hi-wing, V-tail, wire bracing, span 34', area 170 sq.ft., net wt. 120#, with sink rate of 3.3'/sec or less.

We are all familiar with J. Maupin's Carbon Dragon and the fun that Gary Osaba is having staying up for hours after a 200/300' auto tow. The Carbon Dragon has a sink rate of 1.65'/sec with a 180# pilot.

Why not a tailless/flying wing glider. There are a few existing gliders that would make a good starting point; Mitchell B-10 & U-2, MIniBat, Backstrom Plank and Marske Monarch.

Anyone interested in a copy of the Lissamen article can send me a SASE business envelope.

Fred Blanton
4785 Esquivel Road
Vacaville, CA 95688
(707) 451-3341

(ed. - I would imagine that some of the hang glider community would tell you they already have what you are looking for, but perhaps without the fully enclosed cockpit like a Carbon Dragon. It will be interesting to see what type of response we get.

Thanks for trying to put your letter into an easy to use format. Unfortunately, most things that come in typed have to be typed over again to fit the format in the rest of the newsletter. I have tried to get away from cutting and pasting the text material in order to give the newsletter a more professional and consistent appearance.

The two best ways to get input are either on a floppy disk in DOS format, or through e-mail since that can be directly downloaded and electronically converted for the newsletter.)

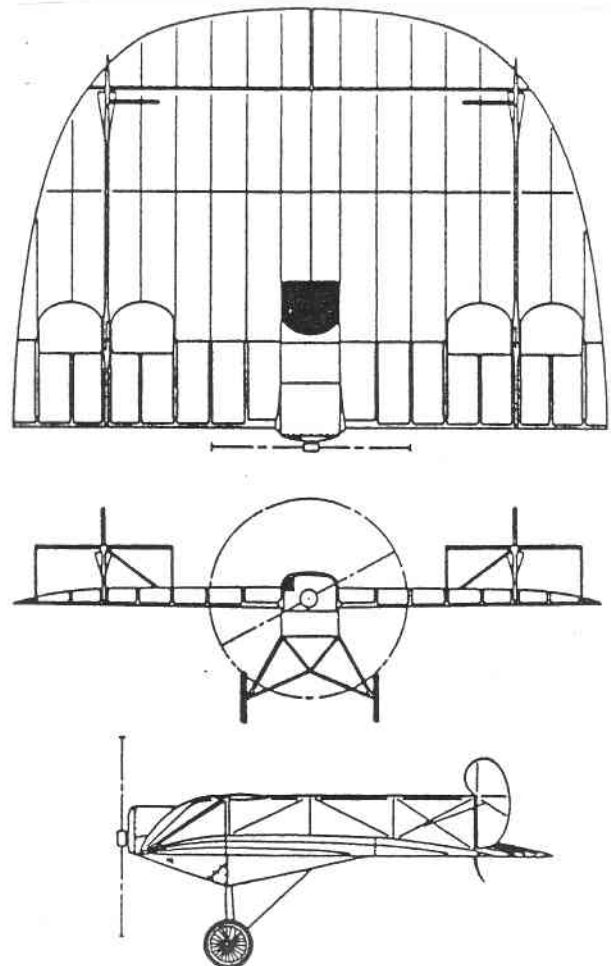
TWITT:

I talked recently for the first time to Bernard Rice of Osceola, IN - just down the road from my boyhood home of Elkhart. Mr. Rice has written all the definitive modern works on Dr. Cloyd Snyder's low-A/R ARUP planks of 1932-5 as well as his friend Milt Hatfield's "Little Bird" series. His most recent article (Skyways, 7/95) entitled "Those Intriguing Low Aspect Ratio Flying Wings", inspired the connection when it arrived with other nice material via Saudi Arabia from Phillippe Vigneron! The article features previously unpublished sidelights and unique new three-views by Mr. Vigneron.

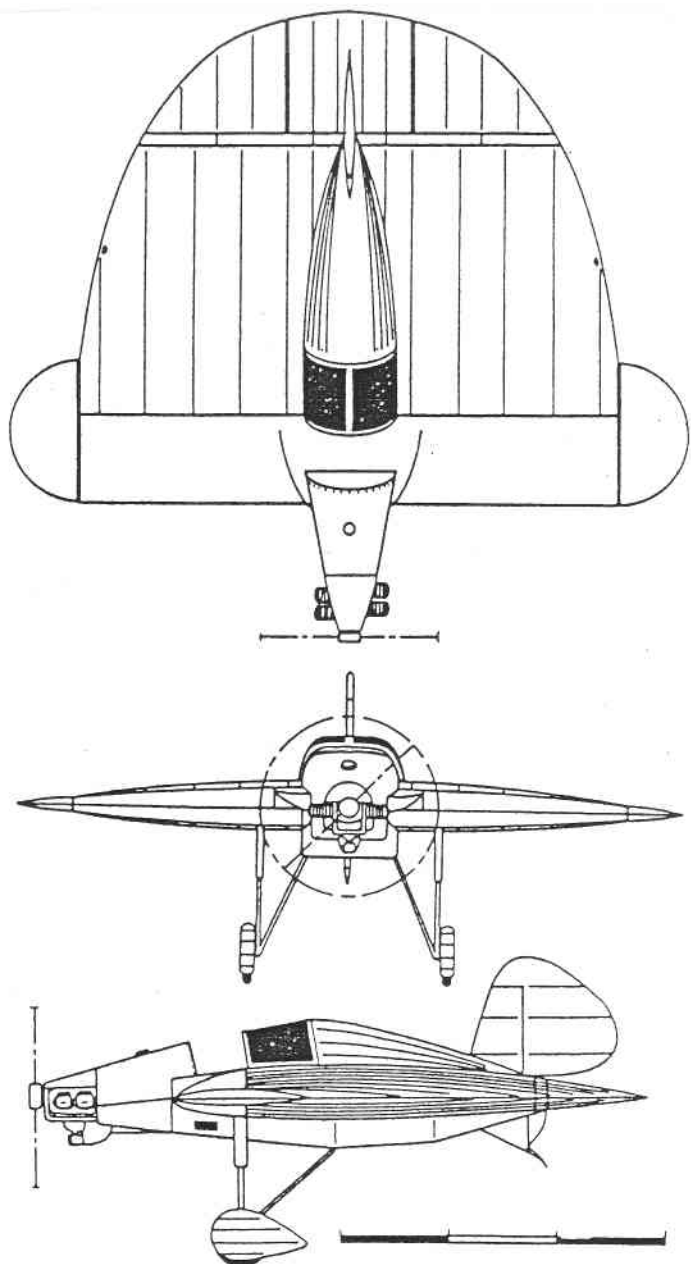
Mr. Rice informed me that Milt Hatfield died in 1994, not long after my last visit. His wife still has his ARUP material (including some original S-4 (or 2?) plans, if I recall correctly. Mr. Rice had returned everything to Dr. Snyder's daughter, except for prints of some historic photographs. She too is in very bad health. Potentially good news is that Dr. Snyder's son's last known address (1988) was right out in sunny TWITT land:


Richard Snyder
4886-A Orchard Avenue
San Diego, CA 92107

BELOW: The SNYDER-ARUP S1



He has some of the old ARUP stuff, and according to Mr. Rice, "was interested in promoting his father's design concept." Apparently he was unable to reach financial agreement with Milt Hatfield. However, if you can track him down, why not invite him to a meeting? He might have interesting information or views to contribute. He may now be the only surviving direct connection to Dr. Snyder's group.



95  SNYDER-ARUP S2

Incidentally, my adult interest in tailless aircraft date directly to reading Bernard Rice's Sport Aviation article of 3/76. I read it in 1972 when I joined EAA, and it was the first bibliography entry.

Well, enough for now.

Best Wishes,

Serge Krauss

(ed. - I will publish some of the three-views from the article since I don't recall having ever come across them before and because we seem to have a good size group who like low-A/R aircraft.

There are about a dozen R. or Richard Snyder in the San Diego phone book, and most do not have any address listed. Maybe Ed Leiser at the Aerospace Museum knows of him and could provide a lead? We will try to find him.

The Bernard Rice article will be added to the library.)

3/21/96

TWITT:

Thank you very much for your kind work as editor of the interesting TWITT Newsletter with the good report from the meetings and information from the world of tailless aircraft around the world.

Always I am very happy to see the newsletter from California.

Today I have a little request for publishing in the newsletter. I am looking for a copy of the book titled: Unconventional Aircraft, Second Edition, by P. M. Bowers, but unfortunately it is out of print.

Maybe a TWITT member owns a copy of this book and I would be very grateful to get Xerox copies from page 58 "Recreational Tailless Designs" and page 68 "Homebuilt Deltas" of this book.

I would be very glad if a member could send the copies to:

Rudolf Storck
Bruckmeierweg 2
82041 Deisenhofen/Germany

In advance, I thank you very much for your kind help in this matter as you helped me before in the same case.

I am finished with the manuscript to my book Tailless Aircraft of the World and am hoping my publisher, Aviativ-Verlag, will start his work this spring. I hope to send you a copy in the spring.

All the best and thank you very much in advance.

Rudolf Storck

(ed. - I have a copy of the first edition of Peter Bower's book, but the pages don't quite match what you seem to want. If any member out there could help Rudolf with his request we would be grateful.

You didn't say whether or not your book would be published in both English and German, but in either case we are looking forward to receiving a copy for the TWITT library.)

March 9, 1996

Below is part of contribution by Serge Krauss.

TWITT:

At the intention of Mr. Rudolf Storck, please find herewith some information concerning the waverider concept, found in the magazines Aviation Week & Space Technology (Nov 26, 1990, pp. 124-125, "Ohio State Defines Concept for Waverider Business Aircraft", by Edward H. Phillips/College Park, MD, and; Dec 10, 1990, p. 67, "University Developing Computer Code to Integrate Waverider, Scramjet Engines", by Edward H. Phillips), Flight International (Sep. 26, 1995, p.30, "NASA Tests Hypersonic Design", by Andrew Doyle/London) and Air & Comos/Aviation International (No. 1543, Dec 8, 1995, p. 22, "Le 'Waverider' Piloté par Réseaux Neuronaux" [sub-title - Les Américains développent un système de contrôle de vol peu orginaire pour un futur véhicule hypersonique], by Bill Sweetman, Avec Christel Tardif). (Sorry the copies are quite bad and I don't know if you could use them. If not, please let me know, I will send another directly to Mr. Storck.)

Please also find a brochure on the Paneck PUL-10 (thanks to Ing. Reinhold Stadler).

And what about TWITT's fax...

Best regards,

Phillippe Vigneron
Saudi Arabia

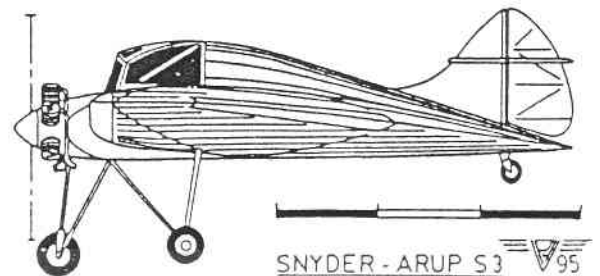
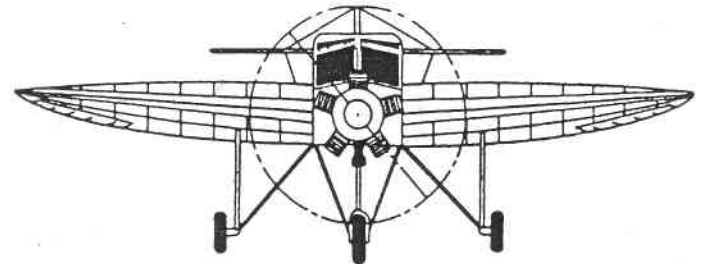
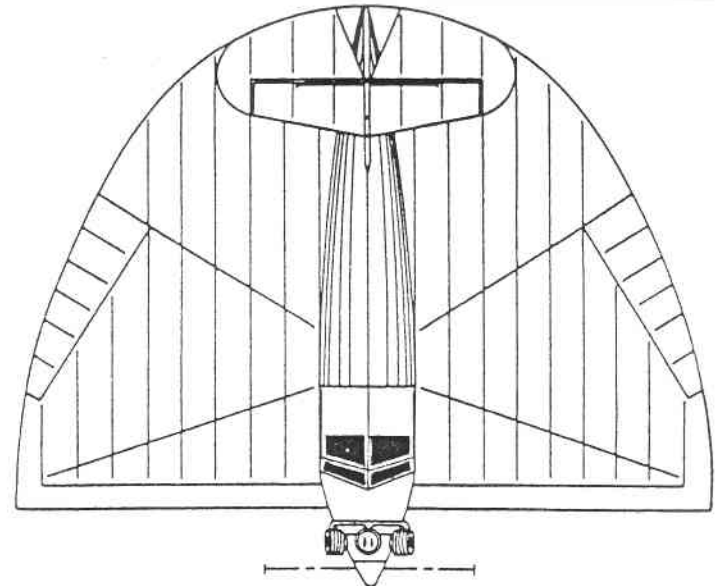
(ed. - Thanks for the material on the waverider. You were right in that the copies are not suitable for showing pictures of the concept drawings. So, could you please send another copy to Rudolf Storck at the address in the previous letter. Thanks for the assistance.

The PUL-10 brochure is by far the best we have seen so far on the two-place flying wing. It is the first one that shows it broken down into three pieces for easy trailering with a center section right at 8' wide which stays within most state's rules for vehicle width. There are some excellent color photos we may try to get half-tones of and publish as space permit in future issues.

All of this material will go into the TWITT library.

I am not sure what you mean by TWITT's fax. We do not have a fax telephone number, but you can get through to us on the Internet using the e-mail address shown on page one. This is an excellent way of communicating text material and it does have the capability of including files and pictures if you have the computer power. I hope that answered your question.

Again, thanks for the material, and stay in touch by whatever means you find the easiest.)



19 Mar 1996

From: Robert Osborn
Reply-To: robert@mvel.demon.co.uk
Subject: The Wing Is The Thing.

Dear Bob Fronius,

I have been passed on your name as a contact for the T.W.I.T.T. group, I hope this is the right email address!
I am a British hang glider pilot with an interest in researching into tuck and tumble susceptibility of hang

gliders. I understand that members of the T.W.I.T.T. group may also be interested in aerodynamics of tailless aircraft, and that you possibly have a library of relevant material.

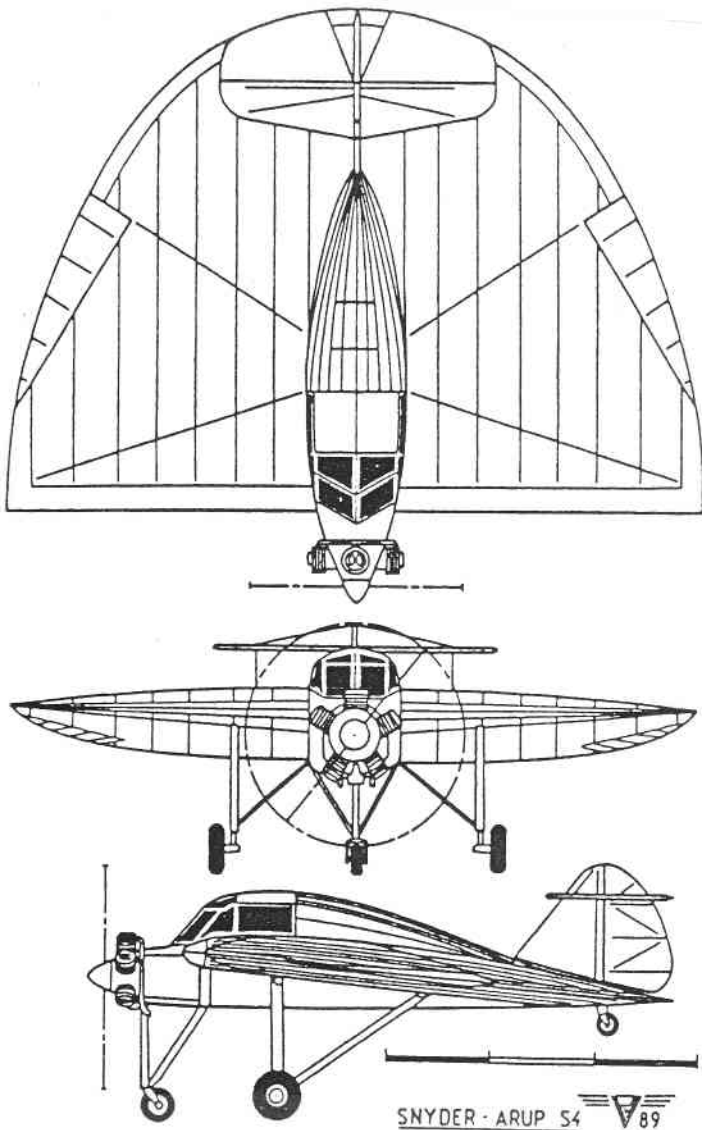
Please could you send email me a little more information about T.W.I.T.T as it is likely that I would be interested in subscribing to your newsletter.

Thanks for your help,

Robert Osborn

Midland Valley Exploration Ltd.
14 Park Circus
Glasgow G3 6AX Scotland.
email: robert@mvel.demon.co.uk
Phone: +44 (0)141 332 2681
Fax: +44 (0)141 332 6792

BELOW is more of the Serge Krauss' contribution.



(ed. - I sent Robert an e-mail back the evening I received it and got the following.)

30 March 1996

Hi Andy,

Its great to hear from you. Thanks for the info on TWITT, I can't resist, I must send you the my funds for membership as soon as I can get to a bank and draw out some dollars.

To fill you in on my background...

My main form of gainful employment is as a Software Engineer for a small Geological Software/Consultancy company. In my spare time/holidays I hang glide (in my 10th year now) and attempt to research into the hang glider design. I did a degree in Engineering and Computer Science at Oxford, which provides the engineering slant to my hobbies and interests. My key area of HG research is into pitch stability. On this subject I have contributed quite extensively to the HG mailing list. Also I have published technical articles in Skywings. A couple of weeks a year I visit Airwave, working with them as a HG design consultant. What time I have left, I eat, drink, and sleep the drink off...

Regards,

Robert Osborn

(ed. - Well it looks like we expanded our membership into another segment of the United Kingdom. We hope that Robert will enjoy what he finds in the newsletter and from the interaction among the members.)



ITEMS IN THE NEWS

(Karl Sanders and Chris Tuffli both sent us the following article, from which I have extracted the information presented below to give you an idea of what is being discussed. There were no pictures or concept drawings included, so you will have to use you imaginations.)

Aviation Week & Space Technology, "X-36 To Test Agility of Tailless Design", by Michael A. Dornheim/Los Angeles, March 4, 1996, pp. 20-21.

"Stealthy two-axis vectoring and clever use of flight controls are key features of subscale drone, which aims to prove a tailless configuration can have fighter agility."

The X-36 is a 28% scale drone version of a notional manned aircraft with no vertical or horizontal tail in order to

reduce the radar cross section (stealth). The goal is to have a fighter that can out perform the F/A-18.

The shape and other details are being kept secret until actual rollout, although it is said to have a distinct fuselage with a cockpit area.

Yaw control will be similar to the B-2 and Northrop designs. It is mildly aerodynamically unstable in pitch (just like the original TWITT proposal some 10 years ago). The X-36 has a two-axis thrust vectoring system that is different than on the F-22, in that the nozzles are round but still maintain a low radar cross section. The control system also has enough power to overcome a nozzle stuck in an extreme position.

Frame members are built largely of aluminum, with skins being done in low-temperature-cure graphite composites. The control systems have been kept simple with very little redundancy. It will be manually piloted from the ground with some extra heads-up displays due to the rapid maneuverability of the aircraft.

This project has been in the works since at least 1989 and always centered around a tailless design. Although no pictures were available, the X-36 is being tested openly since it does not contain any classified features or low observable materials.

(Also in the same issue was this tidbit on a new proposed use for the Tier 2+ aircraft. It's this type of thinking that will keep the UAV project going well beyond the original mission concept.)

The Teledyne Ryan Aeronautical Global Hawk would be rigged to carry three to six advanced missiles carrying a kinetic energy weapon designed to destroy a theater ballistic missile in its boost phase.

The system would take advantage of the UAV's long range and loiter capabilities to provide battle field coverage. The idea is to shoot down the missile while still over enemy territory. The higher altitude launches would also allow for engagements at longer ranges since drag would be less than that on missiles fired from manned fighters.

LIBRARY CONTRIBUTION



Bob Eastgate sent in the following article which might be of interest to some of our members (are you reading this P. Burgers?).

"A Bird Is Not A Plane", by Doug Stewart, National Wildlife, February/March 1996, pp. 32-41. "We know how to fly, right? Then why are scientists only now on the verge of figuring out how animals take to the air?"

The article relates bird flight and construction to that of man-made aircraft and shows how much better birds are.

(ed. - It talks briefly about man-powered flight which brings up a telephone call I received from Canada a few weeks ago. This gentleman is developing a light weight, powerful man-powered propulsion system for ultralights. He had heard about TWITT and wondered if it might be a venue for his work. I have asked him to send me some material on his project and hopefully we will have it by the May newsletter.)



DONATED MODEL WING PLANS

We have received two sets of model wing plans that the donor would like to see go to someone who would build and fly them. These are full size plans but there are no instruction books so they are probably not for the novice builder. They have sort of elliptical wings with small fuselage sections and vertical tails. Both plans were produced by Western Plan Service of Torrence, CA.

One is the Sunbird, at about 100" span and 18 sq. ft. of area.

The other is called the R-2, at about 118" span and 20 sq. ft. or area.

If you are interested in either one or both of these plans and would agree to send us back pictures of the finished project, please send in \$2.00 ea for postage and handling. This are to large to be reproduced for more than one issuing so it will be first come, first served.

AVAILABLE PLANS & REFERENCE MATERIAL

Tailless Aircraft Bibliography

by Serge Krauss

4th Edition: An exten-sive collection of about 2600 tailless and over 750 related-interest listings. Over 15 pages of tailless design dates, listing works of over 250 creators of tailless aircraft, and the location of thousands of works and technical drawings for the Ho 229 (IX), Me 163, & Me 262.

Cost: \$23 (Domestic)
\$32 (European destinations)
\$35 (Asia/Australia destinations)

Europe \$41 /yr
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(includes 12 issues of SAILPLANE BUILDER)

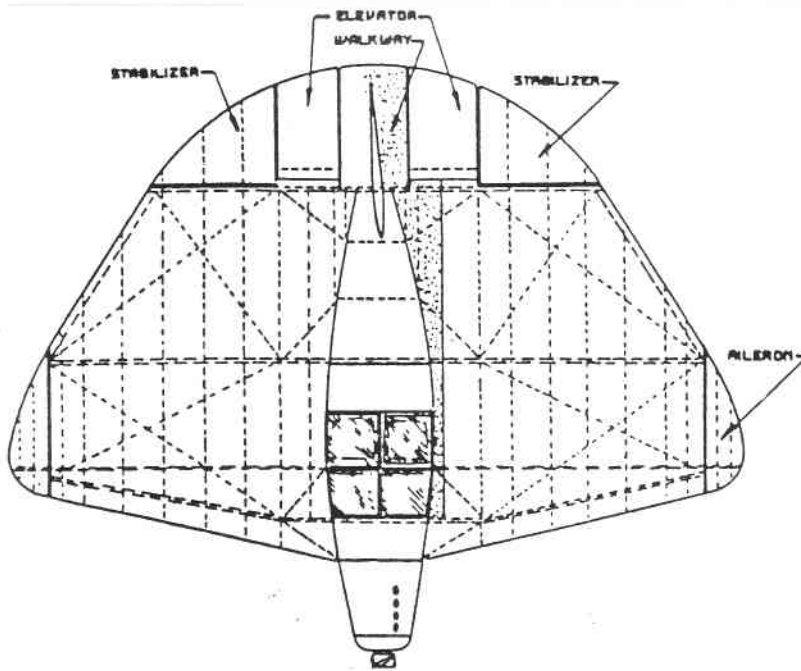
Make checks payable to: Sailplane Homebuilders Association, & mail to Secretary-Treasurer, 21100 Angel Street, Tehachapi, CA 93561.

BELOW: Hoffman's All-Wing Airplane which he designed after leaving Snyder. It was built for Mr. J. Leslie Younghusband of Chicago. From Serge Krauss' contribution.

heightened consciousness about ultralight soaring, to encourage an exchange of knowledge and information making possible the growth of this sector of soaring, and to serve members in their common ultralight soaring needs.

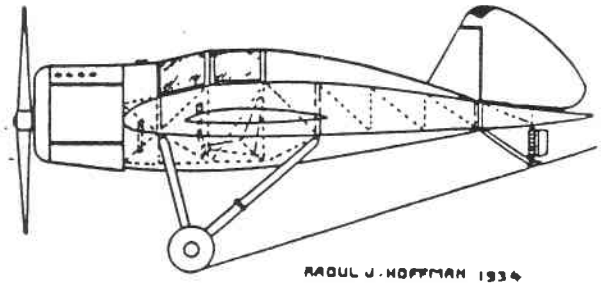
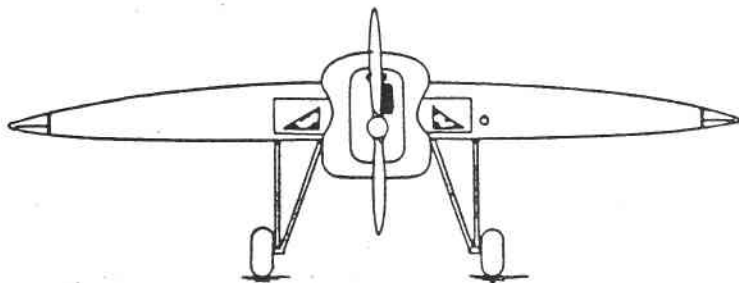
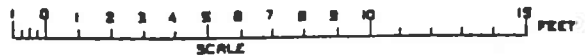
Donations are being accepted to cover the cost of sending the newsletter: suggested amount is \$15 for one year (may be later credited towards first year's membership dues), or you can send \$25 for your "Founding Membership".

Please make checks payable to:
 Chuck Rhodes
 130 Los Padres Drive
 Camp Pendleton, CA 92054
 (619) 385-4068



**~HOFFMAN FLYING WING~
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WEIGHT EMPTY	900 LBS
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OVERALL LENGTH	17'-8"
MAX CHORD	14'-8"
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AREA	237 SQ. FT.
POWERPLANT	25 BHP ENGLISH CRAUS
PROPELLER	7'-0" DIA. 4'-4" PITCH
TWO SEATER, DUAL CONTROL	
RETRACTABLE LANDING GEAR	
ENTRANCE OVER THE WING	
INDIVIDUAL STABILIZER ADJUSTMENT	
CENTER SECTION WELDED STEEL TUBING	
OUTER SECTION WOOD, THREE BEAMS	
LANDING SPEED	25 MPH
TAKE-OFF SPEED	30 MPH
TOP SPEED, FIXED LANDING GEAR	135 MPH



ULTRALIGHT SOARING NEWS

The United State Ultralight Soaring Association's newsletter is now available. Their purpose is to foster a

FOR SALE

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5500 rpm with a 2.1 to 1 reduction unit
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Alex Kozloff
(714) 786-7742

BELOW: In keeping with the general theme of low-aspect ratio wings this issue has seemed to take (quite by accident, by the way), I thought I would fill this last page with an ARUP and a PANCAKE. I'm sure of the source for this page any more since it has been laying around just waiting for such an opportunity.

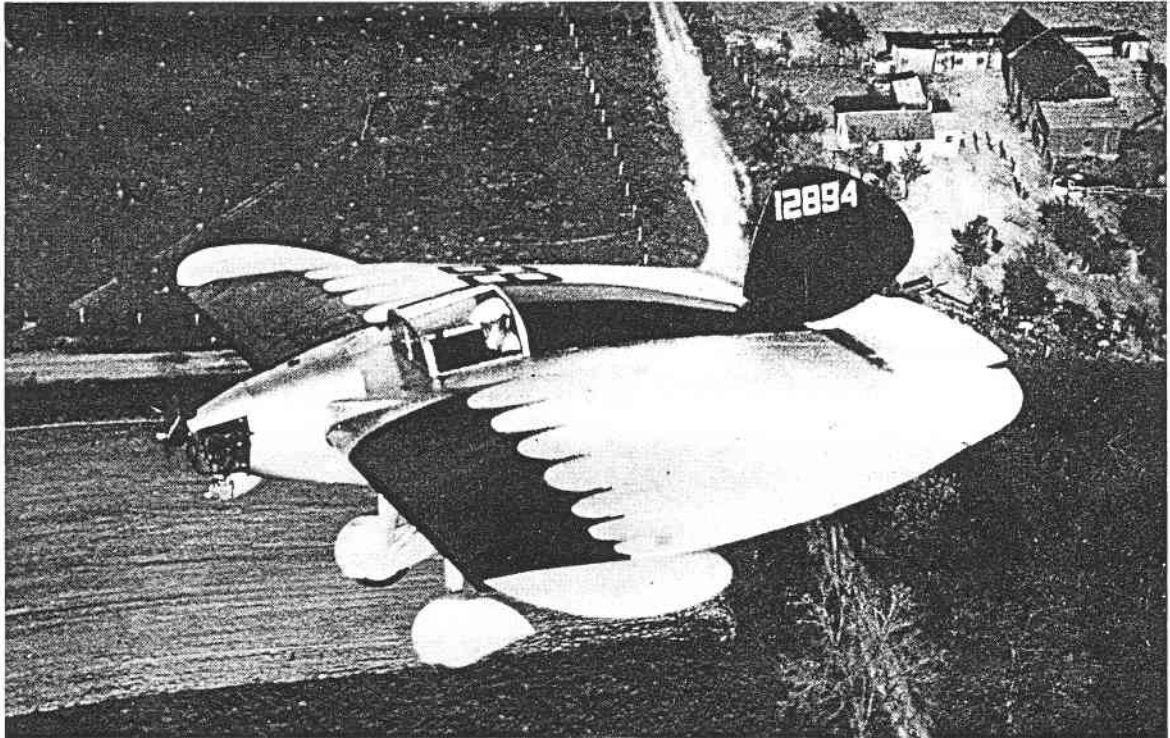


Fig. 6-6. The powered Arup No. 2 with projecting ailerons.

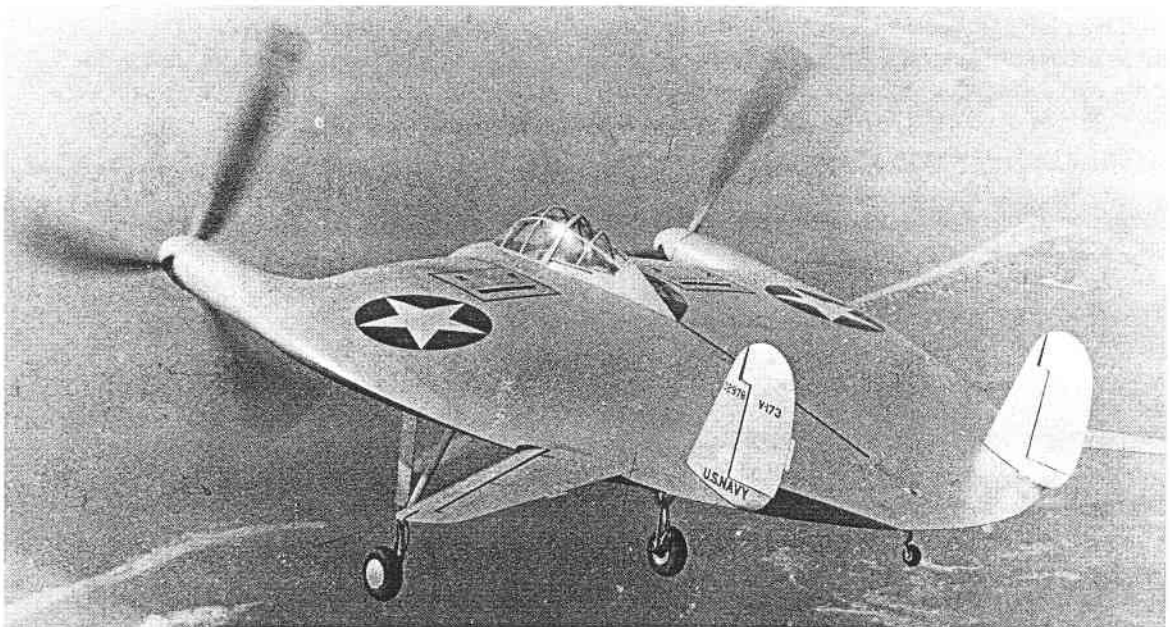


Fig. 6-7. The famous Vought V-173 Flying Pancake built for the U.S. Navy in 1942 as a proof-of-concept prototype.