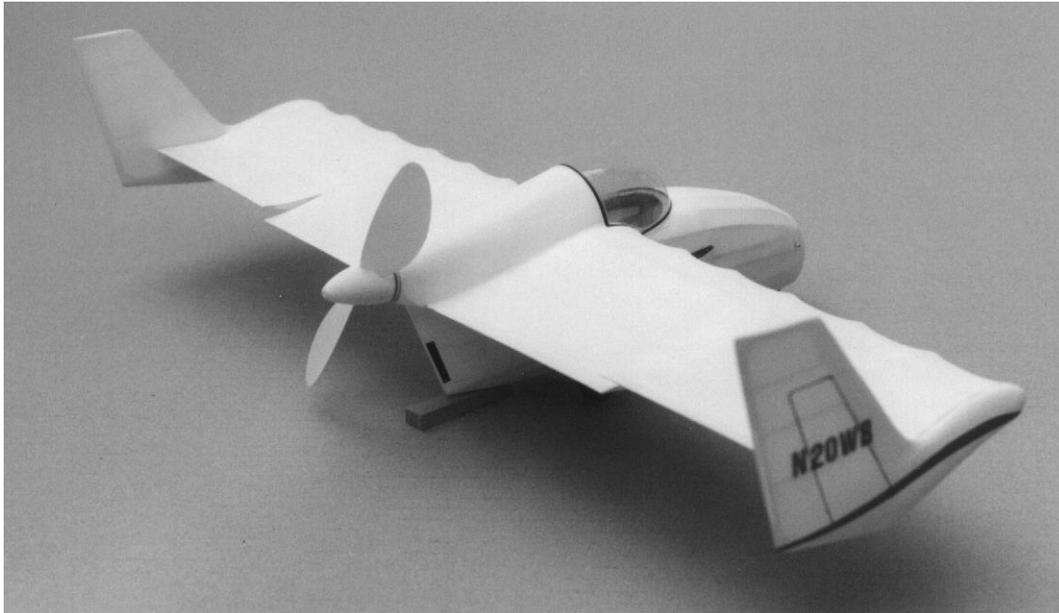


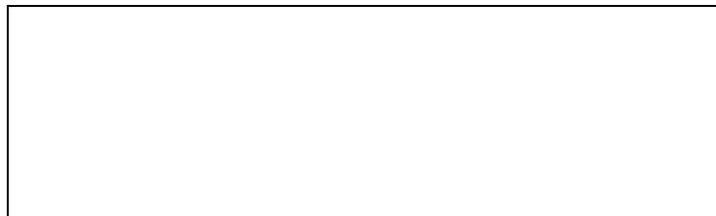
T.W.I.T.T. NEWSLETTER



This Backstrom WPB 1 was contributed by Chris Strachan from Cambridge, UK. More information will be available in next month's newsletter on other models and how you can get or exchange plans for many of them.

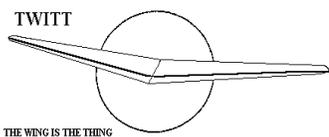
T.W.I.T.T.

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



The number after your name indicates the ending year and month of your current subscription, i.e., 0005 means this is your last issue unless renewed.

Next TWITT meeting: Saturday, Ma7 20, 2000, beginning at 1:30 pm at hanger A-4, Gillespie Field, El Cajon, CA (first hanger row on Joe Crosson Drive - Southeast 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 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:

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- Vice Pres:**
- Secretary: Phillip Burgers** (619) 279-7901
- Treasurer: Bob Fronius** (619) 224-1497
- Editor: Andy Kecskes**

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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).

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PRESIDENT'S CORNER

Well, another month has come and gone and I don't know where the time went. I have been able to make some major changes to the web site. Most of them seem cosmetic, but they should enable people for lower speed modems to download the basic pages faster and then decide which pictures to open based on file size. I have also added more links to the various link pages and will be doing more in the coming weeks. These links have come from the Nurflugel bulletin board or my own searches through the Internet looking for interesting and informative things.

I hope everyone is enjoying what is on the web site. If you have any interesting things you would like to share with our other members, send me the link, a photo, an article, etc., and I will incorporate what I can. Like I said last month, I have a lot more disk space to work with now, so send what you have. I also found some shareware that makes good thumbnails so large files become workable.

I will make a special effort to get some of Terry Baxter's drawings on a page to increase the exposure of his ideas. It is refreshing to see someone so enthusiastic about building a practical (at least for him) flying wing this is relatively simple in terms of construction materials. I wish Terry a lot of luck and hope all of you contribute what you can to his effort.

I understand from Bob and June that the Arvin reunion went extremely well. There were at least 100 people present at the Saturday evening banquet in Tehachapi and which says a lot for the event's organization. This was a monumental effort by Jan Armstrong to get recognition for this historic site in California. There were static displays and a dual glider air tow to the site of TG-2s. They left behind a bronze marker so that others visiting that area would know of its heritage.



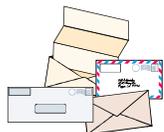
**MAY 20, 2000
PROGRAM**

The program this month will feature Gene Larrabee, Prof. Em., MIT, AFAIAA, FRAeS, making a presentation on Stability & Control Problems with Early Flying Machines. Gene provided the following about his talk:

“The Wright Brothers were first in 1903, and developed unusual methods to deal with the stability and control problems of their unusual aircraft. They learned to fly it perfectly by 1905, and received a patent for mechanical interconnection of their roll and rudder controls. Glenn Curtis, Louis Blériot, the Voisins, Levevasseur, Déperdussin and Sikorsky all arrived at different solutions and were sued, or threatened with suit, by the Wright Brothers. Orville Wright won his patent suit in 1916 and retired a wealthy man. By the end of World War I all airplanes had either a Blériot stick type or the Déperdussin wheel type control. Sikorsky persisted in crossed rudder controls for his personal airplanes in the 1920’s. Airplane stability was not well understood during this entire period, and was frequently degraded by practical construction considerations.”

Professor Larrabee received his BS in Mechanical Engineering from the Worcester Polytechnic Institute in 1942. He received an SM in Aeronautical Engineering from MIT in 1948, where he became an Assistant Professor in 1951. He held summer positions at NACA, NASA, Grumman, Douglas and the FAA. He took early retirement from MIT in 1982, after participating in the human-powered airplane movement. After moving to California in 1985, he became a Professor at Northrop University until it closed in 1991. He is co-author with Malcolm Abzub of a book on Airplane Stability and Control. He has designed both propellers and windmills.

For you history buffs, this should be a very interesting program. As usual, Gene will be open to answering questions, so this is a good opportunity to fill in your knowledge gaps.



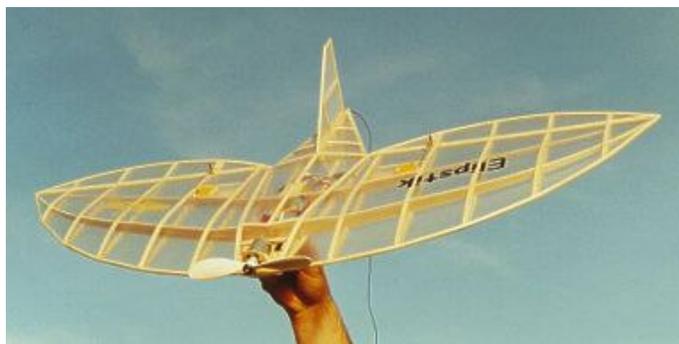
**LETTERS TO THE
EDITOR**

4/23/2000

To: Nurflugel Mailing List
From: "scherrer matthieu" <p.c.scherrer@wanadoo.fr>
Subject: A Tailless Slow Flier

Have a look to this site, and see the Elipstick. This strange small model has a sharp wing tip!

<http://www.titanic-airlines.de/framesetf.htm>



A only wing " Slow flyer " of the speed 280 class. The Elipstick is constructed almost entirely from Balsa. From the even lower surface of the eliptischen wing, this model builds directly from a 1:1 structural drawing in a very short time. By covering it with transparent material the component system becomes available for inspection and the attractive building method shows particularly well. The Elipstick is propelled by our GearDrive 280 and 7-8 cells of 110-350mAh size. Alternatively one can substitute a Speed 400 for an engine, also with 6-7 cells of 600mAh, which makes the small wing very lively!

(ed. - This description material was run through an electronic translator, so please forgive any minor errors in what was said above.)

4/10/00

TWITT:

I've enclosed a check for a two year subscription to TWITT. Thank you!

Your newsletter is always a fascinating read. It's amazing that even designs such as the Arado Ar E. 555-1, that are over fifty years old, still look state of the art just of the drafting board. Or maybe now it's a day off the computer design screen, if that's what they call it (I remain computer illiterate as I'm inundated by reading material as it is).

After all these millenniums the Indonesian Zanonnia seed low aspect ration glider is still state of the art and an inspiration. I wish that the Zanonnia tree was cold hardy as I'd like to have one in my backyard.

Look forward to the TWITT smorgasbord each month.

Best Regards,

Edwin Sward
Wocester, MA

(ed. – Thanks for the long-term renewal. It is always nice to know that many people out there like the variety of information included in the newsletter each month. Most of the time it is not by choice, but reflects what I have available at publishing time.

As for the computer end of it, I think you were referring to CAD/CAM programs which are used so much in today's aircraft design work.)

4/27/00

TWITT:

I was interested in you blended wing body section. I work for a FOX affiliate in West Palm Beach Florida and we did a news story last November on a designer who built BWB's from as early as the 1920's. Their web site is:
<http://www.aircrash.org>

I can send you a video copy of the news story free of charge if you are interested in viewing it. It's about 6 minutes long.

Return email me with an address and I can send one out.

Great web site!

Ralph T. Capobianco
 Senior Promotion Producer
 WFLX FOX 29
 West Palm Beach, FL

(ed. – The designer Ralph was referring to was Burnelli and, of course I took him up on the offer for a copy of the video tape. He enclosed the following letter with the tape.)

Enclosed is the news piece my station did on the Burnelli Aircraft Company.

If you like the presentation, share it with as many people as you can. I am an aviation enthusiast who likes to build and fly R/C airplanes and I like talking airplanes...plane and simple...(sorry'about that).

I first read about these designs in 1996 in Flight Journal. After talking to the Burnelli President, Chalmers "Slick" Goodin and my general manager, our news department took over.

If "Slick" sounds familiar to you, he was the test pilot before Chuck Yeager in the Bell X-1.

You can get plans for a couple of Burnelli Free Flight model planes from the Burnelli web site. I have a copy from a 1950 or '52 Mechanics Illustrated. I hope to get started on it this year.

Let me know what you think of the news piece. I like all kinds of feedback, good, bad or otherwise. And if you know of any older pilots or modelers let them see it too. Burnelli was always in the newsreels in the 30's so these guys were around when the originals were flying.

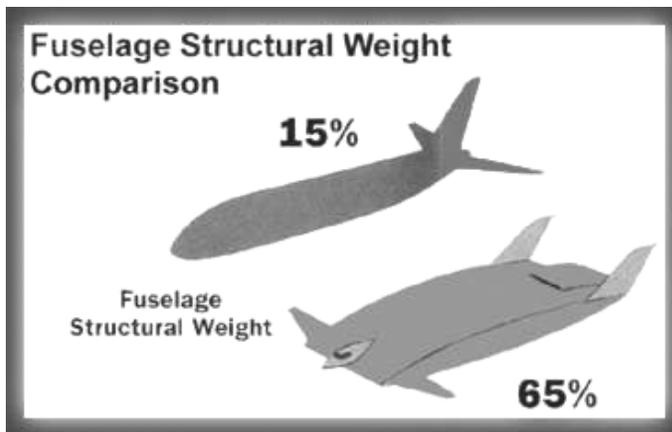
One more note, I start a new job here in West Palm Beach on April 10th, so the phone number to FOX 29 will be invalid. However, you can still reach me by e-mail at: rcapo@aol.com.

Sincerely,

Ralph T. Capobianco

(ed. – In viewing the tape, we found it included footage on how passengers had survived the crash of a Burnelli designed airliner due to its structural soundness compared to a more conventional design. I have included one of the illustrations from the web site below so you can get an idea of what is being talked about here.

The video tape is available for viewing at the TWITT hanger during the times when someone is there (usually Saturday through Wednesday, 10am to 4pm). Since it is so short, it is not worth making copies of it for individual mailing, however, I will attach it to any of the other tapes we distribute, if you specifically ask for it.)



4/19/00

TWITT:

I'm looking for publications by Dave Jones. I know he published in the following periodicals:
 Model Builder 10/73
 Model Builder 1/77
 RCM 5/72
 RCM 7/75 "Standard Plank construction article"
 MAN 5/77 "Why Not Flying Wings?"

Best regards

Krzysztof Waskiewicz
 Warsaw, POLAND
 E-mail: krisabc@tarnet.pl
 Reserve E-mail: krzysztof@gempoland.com.pl

(ed. – I am sure there are enough members who are modelers out there that may be able to help Krzysztof locate some of these articles and any others by Jones. I would appreciate everyone digging deep on this one, since Krzysztof has been a great contributor to our library on Kasper wings over the past several months. (See article below on his latest mailing.))

The following came back from my request of Bill and Bunny Kuhlman. "Andy forwarded your request to us. We believe we do have some of the cited articles in our files.

We'll take a look tomorrow and let you know what we might have.

A suggestion which we will provide now and which may of assistance to you...Contact Carolyn Gierke, 1276 Ransom Road, Lancaster NY 14086. Her husband was quite a collector of aeromodelling magazines, and she placed advertising in the various model publications for some years. She searches through the collection and photocopies selected articles for a fee. If you send a letter to her with the information you provided in your e-mail message, she may be able to assist you.

Let us look through our own files first, however. We should be able to get back to you some time in the next 24 hours.

We were able to add the article titles (see quotes) to a couple of items on your list." bsquared@halcyon.com

3/29/00

TWITT:

Enclosed is my renewal for this year.

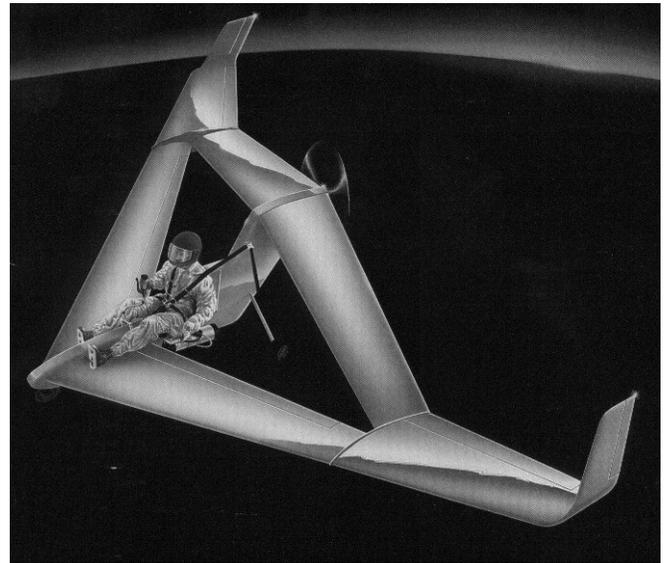
Also, in cleaning out some files I found some articles and a brochure on the Schapel wing design. These articles are from 1984. I think there is one Schapel wing aircraft stored at Chino, CA.

I also found an old brochure on the "Trident" joined wing ultralight. Not sure how well it will reproduce, but maybe you can scan it and reverse the colors. Never actually saw one fly.

Regards,

Kevin Renshaw
Fort Worth, TX

(ed. -We will add these items to the library. I don't think we have a copy of the article "Wakin' Up Buck" by James Lawrence, published in the April 1985 issue (pages 22-25) of Ultralight Aircraft. This is a review of the prototype SA-882 Schapel flying wing powered by a 180-hp Mazda rotary engine. Since it is a copy of a copy, etc., the pictures in the article won't reproduce very well, but the text will copy fine. I have included a photo on the left of the aircraft hanging in the Planes of Fame Museum at Chino.)



I will include a scan of the Trident Joined Wing (above) and see how well it comes out. I know we have published something on this in the year's past, but didn't have time to go back an determine in which issue.

It was good hearing from you after so long. Hope all is well and you are doing lots of flying.)



4/19/00

TWITT:

H IX instead of H XI

The new newsletter arrived. Thanks for putting my letter into it. Unfortunately I did a small but significant error in it. I wrote H XI, but it should read "The H IX is a specialty". Do you think it is possible to correct this in the next newsletter?

In the meantime I went into detail with the H VII. There was some rumor here that the calculations were done only for airworthiness and do not reflect the real aerodynamic layout. For both the H IX and H VII I can now verify that the real design was done accordingly the calculations. I hope to close another gap in Horten-history with this. If there is interest in TWITT I could give a short summary in the newsletter on the findings as soon as I have finished that assessment.

Greetings,

Reinhold
Reinhold_Stadler@mt.man.de

(ed. – I told Reinhold we would make sure to get the correct in this month and here it is. I also asked him to send us a copy of his analysis when it was completed. He thought it would be done for this newsletter, but by publication time it had not arrived. We will make sure to include it next month.)

(ed. – The following is a compilation of two letters from Terry Baxter telling us of his decision on his project.)

3/14 & 18/00

TWITT:

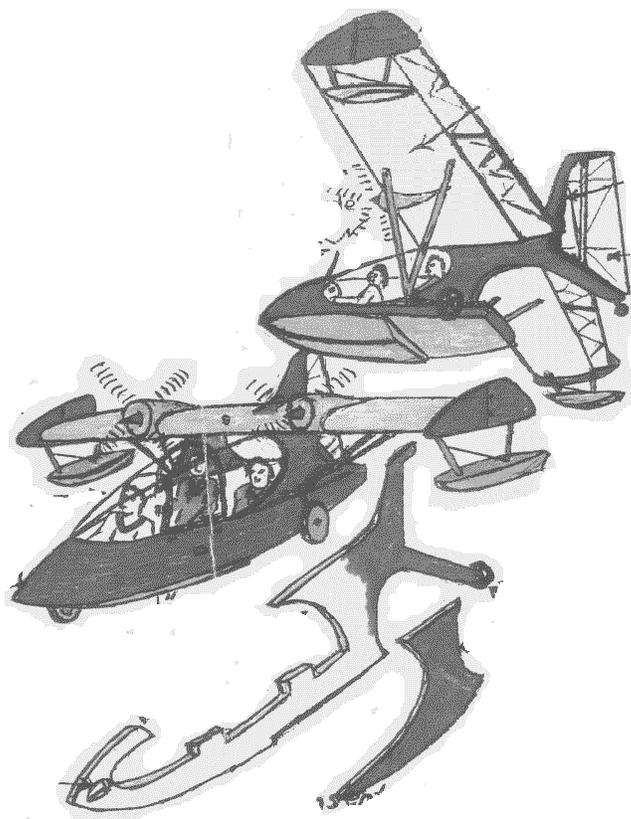
Further to my previous concepts which you have published, I now submit the concept I want to proceed with. It was triggered by the "Choucas" by Noin Aeronautiques (two seater, Vmax 170, Vc 130, Vmin 60 kph, 503 Rotax & 260 kgs empty weight). The wing and rudder assembly I believe seemed suited to adapt to water operation with the large parallel center wing section with tapered tips, although it was a mid-wing. The side-by-side seating made it a wide fuselage which lent itself to development of the hull form and raising the wings to a high position to clear the water as a seaplane. The large rudder also appealed to me for good control when water taxiing in conjunction with throttle control of twin engines.

Although the Choucas could be flown without power because it had a large wing span, the caption was that flying wings were hard to pilot. I have doubted the wing width, but reduced the wing span to about half. I want a slow landing speed so have made the wings deeper for more lift.

The configuration to me, seems eye pleasing, but I need input from experts in relation to wing span as against power, etc. I believe the Liberty Subaru auto engines would be the way to go, but would like to develop a 5 cylinder diesel manufactured from VW barrels as a radial. If the Great Plains aircraft 2600 VW can produce 96 hp, I am sure a 5 cylinder radial could be made to produce at least 100 hp in a direct drive diesel. The Subaru engines should give about 120hp, would use standard auto engine mountings cantilevered off the wings main spar at the CG for balance purposes, with extended shaft to the VW Kombi final drives secured on the leading edge. Donut couplings on the drive shaft extension should reduce vibration within the wings. This combination should give about 100hp at the propellers.

I have selected twin engines for safety and opted for a full width bench seat at the CG for passengers and camping gear. An aircushion seat presstudded (ed. – I imagine he is referring to Velcro) to the bench for comfort, easily removed to pack gear using the same seat belts to secure loads.

Using the ply foam construction and fiber glassing the complete external surfaces, I could produce a very strong hull. Using the throttles of the engines at different revs, and a large rudder, water steering would be simple.



The proposed hull width is 4'6" and approximately 12' long. I believe a plank wing would be suitable. Using aluminum tubing main spars could also be used as fuel tanks which would be at the CG and, would not give any balance problems as fuel is used up.

I have to keep under 614 kgs maximum takeoff weight to be registered under experimental ultralight in Australia.

I would like to keep the engines, batteries, etc. to 214 kgs which give me 400 kgs for the complete airframe, wheels, etc. I have previously built a 12' sailing boat for two people that only weighed 52 kgs, so I should be able to produce a 15' hull for 100 kgs, pilot 80 kgs, crew 80-100 kgs, thus allowing me approximately 120 kgs for the wings, wheels, etc.

I want to build this to a very basic design using the most simple ideas. These include using lever operated, torsion sprung (VW rear suspension of the "Kombi Vans) retract for the wheels. Differential, lever operated cable braking system with external brake drums. It must have adequate wild terrain clearances as the prime purpose of the design is a long distance commuter over Tiger country. I will use strut braced wings of foam ply with aluminum 6" tube main spar or even larger, and; a deep airfoil section in the center, tapering to the ends in depth only. I have no idea of the span or chord and hope members may assist me in the wing design.

Would you copy some of the sketches and dissect enough information out of this letter to distribute to the members. I want as much criticism and help to finalize plans for presentation to the Australian Ultralight Federation and the Sports Aircraft Association of Australia.

Many locals are interested in my Ornithopter which I mentioned in my previous correspondence, but expressed disapproval of the gull wings. I have read the articles of the Raven Wing in the TWITT newsletters and I believe my gull wings will work and, using the wing warps should have adequate control. Because I am 70 years of age, I have added a trike base for power assisted self launching with a comfortable air seat and go-kart steering. Using the soft cover book on sailplanes which I procured through the TWITT newsletter, I believe 25 hp should be adequate to get me airborne and only need about 5 hp to maintain flight seeking thermals.

I still fly every Sunday morning at the Top End Ultralight Club where many self-built aircraft have arrived lately, but as yet no flying wings. But trikes, especially the Australian Edge with the Streak wing capable of over 100 mph are arriving weekly and all these are basic flying wings.

The main thing is I want to achieve all my aims before my "used by date" expires and enjoy flying in craft I have built myself. I cannot think of anything more satisfying in life.

Thank you for printing my concepts in the newsletter as by distributing your newsletter at the Top End Ultralight Club, my concepts have created that much interest that two people also want to build the same plane. May the wind be always in your hair.

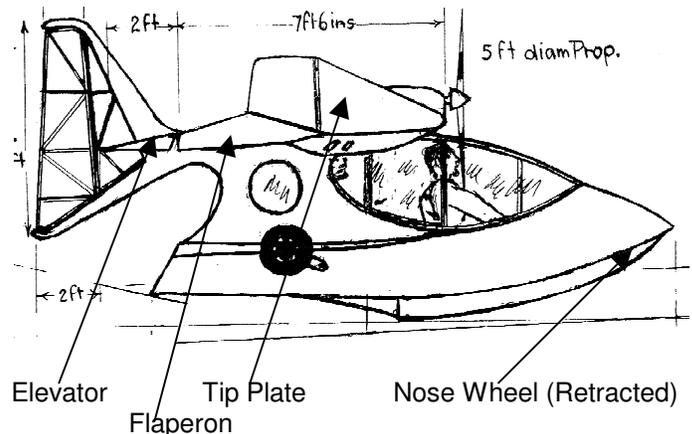
Terry (the Tiger) Baxter
c/o Darwin Butterfly Sanctuary
79 Mueller Road MALAK
Darwin, AUSTRALIA 0812

(ed. - I have included a scan of Terry's final concept design. I some respects it has the look of an expanded

Marske Monarch (rather than Choucas) in the way it uses a central keel and the rudder/tailwheel combination is quite similar. I also included as much of the specifications as he presented on the drawings.

Terry also included a drawing of his trike ornithopter, but I didn't include it here since it is not really a flying wing, at least at this time.)

Hull Length	15'
Total Length (nose of tail)	19'
Hull Width	5'
Tail Height at Trailing Edge	6'
Wing Span	No Value
Center Chord	7'6"
Engine Center Lines	84"
Prop Diameter	54"
Elevators	Chord 2'
	Width 7'
Flaperons	10'



SUPERGLEITER

Aus Papier und Balsaholz

Schnell gebaut

Mit Fluggarantie

By: Curzio Vivarelli & Augustus Verlag

This is the book mentioned in last month's newsletter meeting minutes that we added to the library. We had loaned the book to Pat Oliver (who does a lot of paper modeling) while he was in the hospital, so didn't have it available last month to show you some of the pictures of designs.

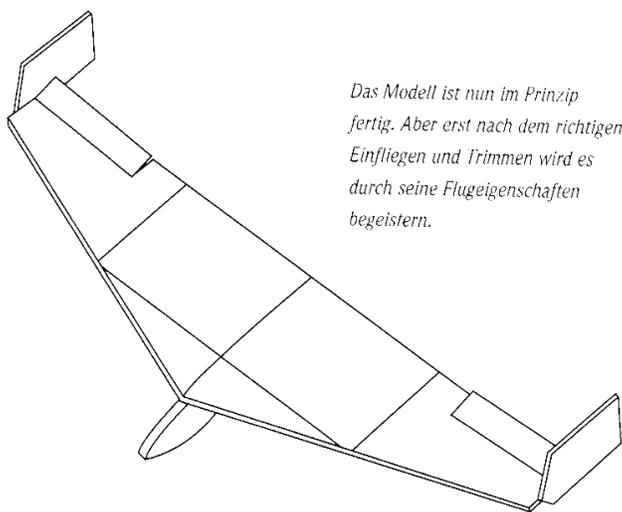
I have run some of the German text through an electronic translator so you can get a better idea of what the book covers. Unfortunately, some of the aviation related words do not convert well (or at all) so just some general concepts can be obtained.

It appears there were several acknowledgements for help provided in putting the book together. Among them were, Karl Nickel and Diedrich Rotert, who most in our group are familiar with.

I did an Internet search of some of the bigger book web sites and just in general and could not find where this book is being sold through these outlets. So here are the publishing statistics, the best could be determined.

Weltbild Verlag GmbH, Augsburg, Germany 1999
ISBN: 3-8043-0536-9

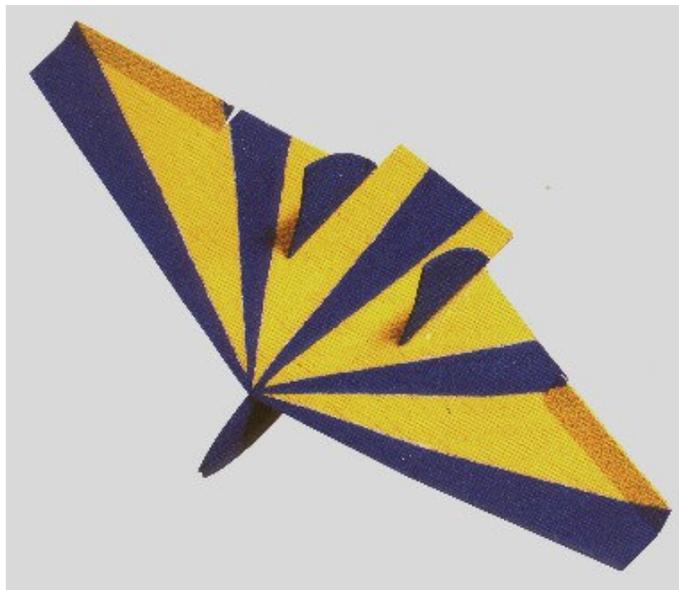
Flying triangle, paper version, this model is a reproduction glider and power plane of Alexander of a Lippisch from the 30's. (ed. – *The rest of the translation didn't come out well, but appeared to be talking about the forward location of the CG for better flight performance. It also said something about the positioning of the tip rudders.*) This model is shown on both paper and balsa versions.



Das Modell ist nun im Prinzip fertig. Aber erst nach dem richtigen Einfliegen und Trimmen wird es durch seine Flugeigenschaften begeistern.

LIBRARY ADDITION

We have received a very nice package from Krzysztof Waskiewicz, of Warsaw, Poland, that contains a 216 page document on some of the initial design calculations for the BKB-1. This document was prepared by Stefan K. Brochocki, who is the first "B" of BKB (Kasper and Bodek are the others). It was completed over the time span of December 1954 to October 1958. There was one section on stress analysis where the record shows it was done by A. DeSmit, although in my understanding the Stefan was competent to do the work.



ABOVE: This is one of the balsa versions of a Fauvel design. They look simple to construct in either paper or balsa.

The story as I understand it is that Brochocki was the primary designer, with Kasper and Bodek putting up the money and doing the construction of the aircraft.

The package also contained reproductions of several Canadian Department of Transport Flight Permits for the BKB-1, registration CF-ZDK-X

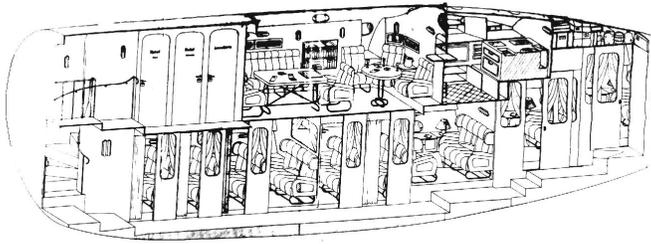
I would like to thank Krzysztof for this document to put in the library, along with all the other material he has sent of the past weeks on the Kasper designs.

EARLY "BWB"

With all the talk about the Blended Wing Body (BWB) over the past few months, Bob wanted everyone know that there was an early version that never made it into the skies, but could very well be the forerunner to today's modern version.

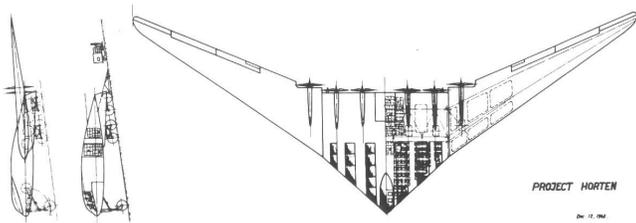
The Horten H XVIII was supposed to be a six-engined, long-range bomber capable of striking targets in the continental U.S. Horten commented that the order to proceed with building the H XVIII came despite his arguments that preliminary calculations were not completed. Construction was started in Kahia near Weimar in April 1945. The H XVIII was basically shaped like the H VIII, with aerodynamic refinements for a Mach speed of 0.75.

To put in perspective with today's airliner proposals, you can see what Horten had in mind for a passenger version at the top of the next page with a cleanly shaped pod blended in under the center section of the wing.



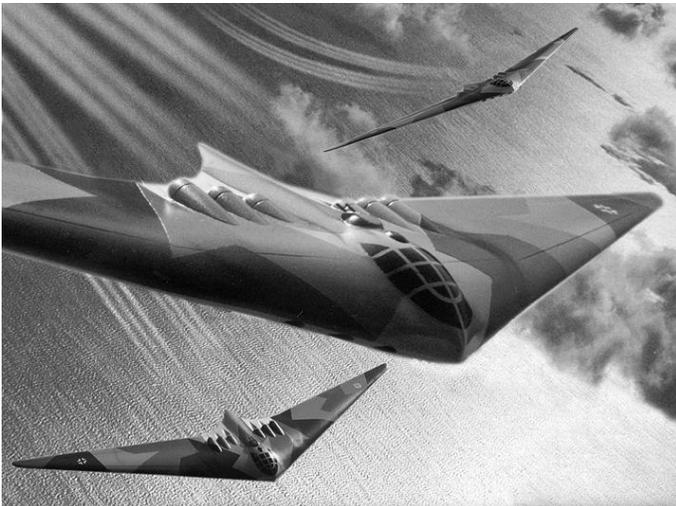
With a 131.6' wing span and made of wood, the H XVIII was rather large and heavy for the available power plants of the day. A 10,000' runway would be required, but these were not available at this point during the war. The non-laminar airfoil had high drag for the projected Mach number and range.

Below you can see some of the similarities between Horten's design and the current direction the Boeing/NASA prototype testing seems to be going.

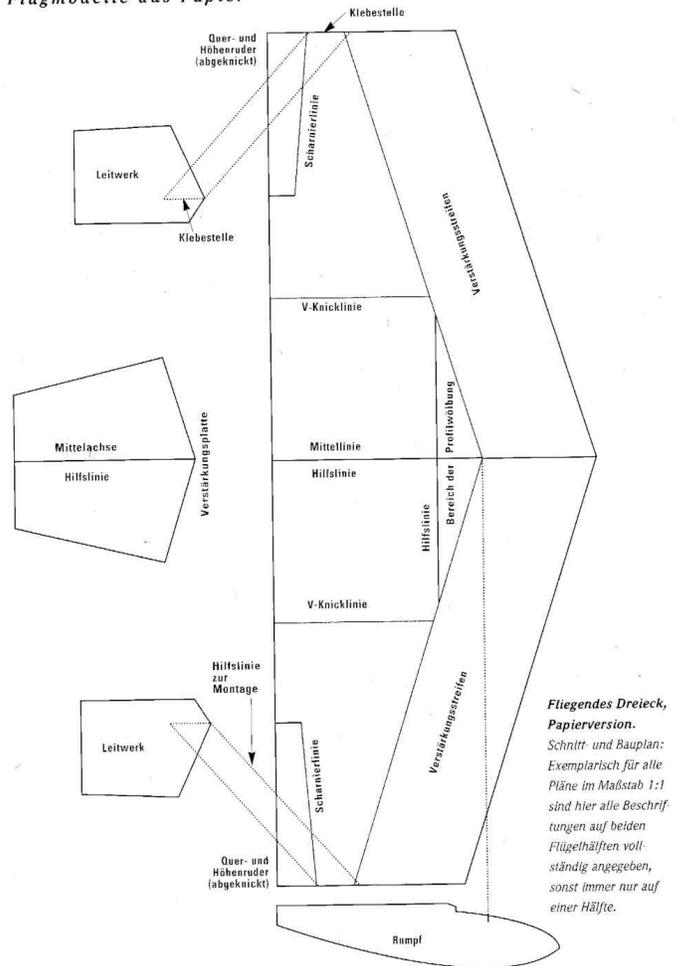


The picture below is an artist's concept drawing of the H XVIII. This is part of an overall set of pictures on Dan Johnson's Luft '46 Viewers Model Gallery website.

<http://www.luft46.com/visphoto/vispix.html>



Flugmodelle aus Papier



ABOVE: This is the diagram for the flying triangle design from Supergleiter.

James Garay
3 Magnolia Avenue
Kings Park, Victoria, 3021
Australia