

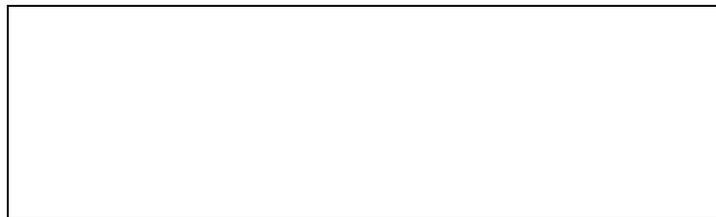
T.W.I.T.T. NEWSLETTER



Josef Wimmer's Leonardo de Vinci Modell M in 1/3rd scale. This picture was contributed by Curzio Vivarelli from Italy, along with a number of other items. See inside for more information.

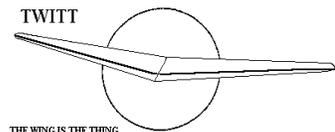
T.W.I.T.T.

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., **0803** means this is your last issue unless renewed.

Next TWITT meeting: Saturday, March 15, 2008, 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.

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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 (#1720), east side of Gillespie or Skid Row for those flying in).

TABLE OF CONTENTS

President's Corner 1
This Month's Program 2
Letters to the Editor 2
From Nurflugel Bulletin Board..... 4
Contibution by Curzio Vivarelli..... 8
Available Plans/Reference Material..... 11



PRESIDENT'S CORNER

As some of you have found out I have changed the user ID and password to the members only section of the web site. It was time to do it and is something that should be done at the beginning of each year to restrict prior members from having access to the newsletters they haven't paid for. The new values are shown in the masthead to the left.

For those of you in the US I am sure you have heard that the postage rate is going up again in May. Since it is only one cent, we will be able to absorb it without having to raise the subscription rates. I am not sure how it will affect the foreign postage rates right now but I am sure we will be able to absorb that also.

To offset the additional cost without a rate raise, I will be asking the two or three complimentary receivers to go to using the electronic copies from the website. These are usually other magazines or individuals we feel offer us a connection to other parts of the flying wing community.

Although the cover picture looks like it is the real thing in flight, a closer look at a blown up version shows it is a model pilot but very well done. Think of what the history of aviation would be like today if Leonardo de Vinci had actually been able to put such a machine in the air.

If you think you would like some of the material contributed by Curzio Vivarelli, you can contact him directly or drop me a line. The postage for me to send it internally within the US would be a lot less than having Curzio mail it from Italy. His e-mail address is at the end of the piece so you can easily ask him questions about any of it or find out what other gems he might have that would be of interest. I am sure Serge would be interested in any additional patents he might have his hands on at this time.



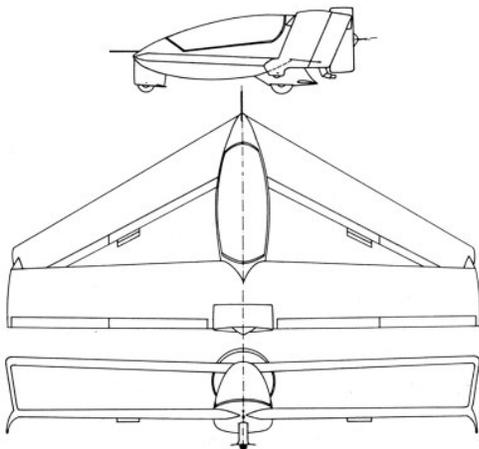
**MARCH 15, 2008
PROGRAM**

The March program will feature Christopher Alan giving us a presentation on an Open Source derivative of the joined-wing Ligeti Stratos microlight designed and flown twenty years ago by Charles Ligeti of North Balwyn Australia will be presented by Christopher Alan at the March 15th TWITT meeting.



Alan, an Open Source software developer, will discuss technical challenges of the project, and the applications of the collaborative Open Source development methodology to aircraft design and fabrication.

The original Stratos featured impressive performance from an economical airframe and powerplant: 97kts on 1.3gph with a 20:1 glide ratio. The design load limit was +9/-6g. The original prototype logged several hundred hours before the crash of a second, highly modified version claimed the life of its inventor.



**LETTERS TO THE
EDITOR**

January 18, 2008

My subscription lapsed. How would I survive without my monthly fix of TWITT?

Perhaps Al Backstrom, Al Bowers, Jim Marske, and /or whoever else might be roped in, could be persuaded to offer thoughts on the design of a light self-launcher, airfoils, layout and structures. It could make it less difficult for those of us who lack access to other launching methods.

H. Pat Gates
Ava, MO

(ed. – It is always good to hear that our members really enjoy getting their monthly issues of the newsletter.

Al Backstrom is the only one in this group that gets the newsletter, but I can certainly forward the request on to them. Al Bowers is going to be out of touch for a short while, as he has been selected for the Special Advisor program at NASA headquarters. This is a very prestigious position and is part of a larger program for career development. I have congratulated Al and wished him good luck as he undertakes this new opportunity.)

February 6, 2008

The magazine Air Classics December 2007, January & February 2008 has “Northrop B-35 Bomber”. Very good photos and information. I do not have all three issue yet, but this is a must for information.

E.F. Turner
San Jacinto, CA

(ed. – Thanks for the heads up on these issues and the article.)

February 11, 2008

Here is the translation of the message by the French builder Vincent Morin (February 2008):

"Good morning,
I have noticed, by chance, that in 2001 you were looking for plans of the PUL-10 or a similar plane.

Have you found a source for plans for such a wing or for a similar one?
 Thanks beforehand for the information you would kindly send me."

I took the liberty of suggesting to him that the aerodynamic design of the PUL-10 had just been published on the January issue of the TWITT Newsletter.

Regards,

Ferdi Gale'
 <ferdigale@alice.it>

(ed. – Thanks for the translation. I also received one from James McLellan where he had run the French through the Bablefish translator and then he applied his limited French abilities. With his interpretation, he wasn't that far off from what Ferdi has provided.)

February 12, 2008

I saw your letter in the TWITT newsletter. This may be old news to you but just in case. There are several short video clips of Horten 'wings on YouTube. This one is 6 & 1/2

<http://youtube.com/watch?v=Z8KnoEcsM94>

Norm Masters
 <libratiger62@yahoo.com>

(ed.- Our thanks to Norm for providing this link. It is an excellent video and includes a lot of different aspects of Horten's work.)

February 24, 2008

Does anyone know if the Davis flying wing is still a viable aircraft. I had followed it for a while when it was a featured article in Popular Mechanics. Then it sort of disappeared. Does anyone know if the designer ever continued to develop it. I read his info on the Davis flying wing where he said that someone broke into the hanger they were working on the aircraft gemini and that illness and divorce took it's toll, but has anything further been done. I would like to know if this development is continuing or if this is defunct. Thanks.

Kelvy hilton
 <kg15@juno.com>

(ed. – I replied back that what we had on the web site was the last we had heard from Davis on promoting his project and that was several years ago. I suggested he write to Davis at the address given and if he should happen to make contact, please let us know the results.)

TAILLESS SYMPOSIUM IN GERMANY

On September 16, 2007 a Tailless Symposium was held in Germany at the famous Wasserkuppe location well known to sailplane and model fans as well.

It had been organized by the equally famous "Oskar Ursinus" Association under the guidance of Dr. Ing. Joseph Tichy.

Another well known engineer, Edward Uden (Horten Archiv, Gebruederstrasse 38, D-25355 Barmstedt) presented a paper covering the life of Heinz Scheidhauer (just deceased), the faithful Horten test pilot who was in Argentina with DR. Reimar Horten. Some of the relevant pictures are enclosed with Uden's permission.

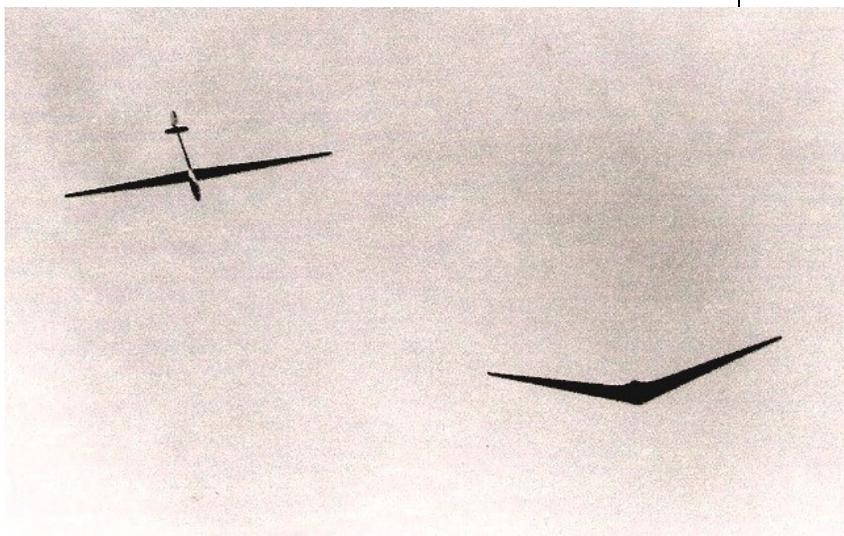
Other presentations (mostly pictures and movies) covered tailless models and airplanes, including the last construction by U. Schaefer who had built the "Aachen Projekt A" some years ago.



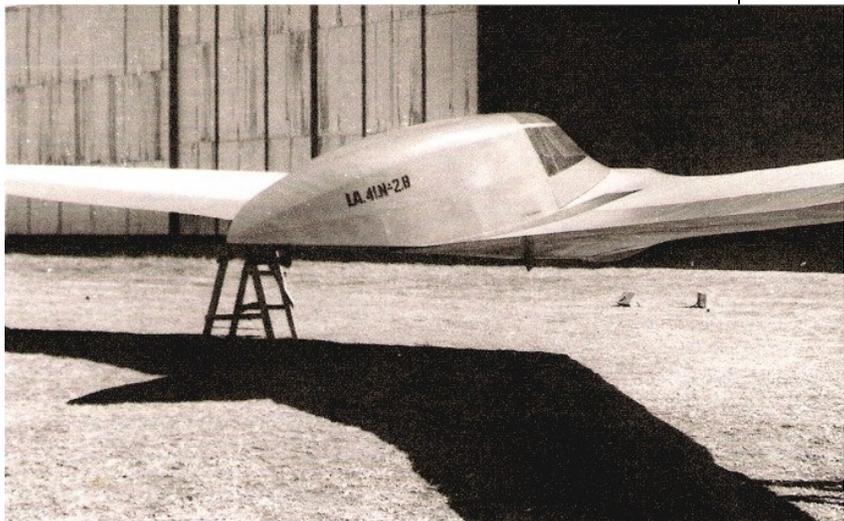
Very often, Scheidhauer flew the Ho IV-6 with his white dog mascot names Spitz.

Ferdi Gale
Baveno VB
Italy

(ed. – Our thanks to Ferdi for providing this information on the continuing interest in the Horten designs in Germany, as well as other tailless designs of both sailplanes, airplanes and models. I have included the pictures that accompanied the article this and following pages..)



Flight comparison between D-30 and Ho IV.



The twin seat Ho XV which Scheidhauer piloted across the Andes from Argentina to Chile (1956).

February 27, 2008

I have been trying to contact Voster Modellbau in Germany that makes a Rotmilan (Red Kite) bird RC. I have found two kits here in San Diego for sale but

the instructions are all in German. I'm trying to find out if there is a translation of the instructions to English and thought you might have run across this model. I've seen your great one-of-a-kind birds on the web and am also wondering if there are any other production-type bird models out there that you know of that might be worth considering to build. I've always thought that the Frigate Bird would be an interesting challenge because the wings have such a high aspect ratio and the birds themselves just fly for ever.

Thanks for your help,

Roger DeWeese
<rdeweese@earthlink.net>

Hello Roger,

I am not familiar with that particular German kit. I don't know of any other commercially available kits for bird models, although there are a few plans available.

I also thought the Frigate would be an interesting project and built one about a year ago. wing creates a real challenge for the structure, and also the radical forward-sweep of the creates a directionally unstable wing shape. I have made a dozen or more flights on my Frigate model but it is very difficult to control. I am still working on modifications that might make it fly well. It DOES look very impressive in the air.

If you want to join the rest of us in experimenting with bird models, try my Turkey Vulture plans, published in the June 2002 Model Airplane news. (Plan number FSP 0602). I have heard from several builders who have had success with the model.

Bob Hoey
<bobh@antelecom.net>

From Nurflugel's bulletin board threads:

Fun Flyin' Videos

I have worked in comic books for 20 years and it never amazes me how stuff you'd see in comics even way back in the 30's are now operable devices in our lives.



Free flight replicas of Horten tailless built in Argentina by Scheidhauer (1956?).

Heavens to Tesla!

These vids are cool!

Greg
<evolbaby@aol.com>

(<http://www.flixy.com/personal-helicopter.htm>)
World's smallest personal helicopter.

(<http://www.flixy.com/super-sonic-business-jet.htm>)
Paulson's supersonic business jet (ed. – Interesting concept aircraft.)

(<http://www.flixy.com/jet-man.htm>)
The Jet Cat! I want one for Christmas! (ed. – This is video of the personal jet pack we showed in the newsletter some time ago.)

H1-b Flies Again

Flying wing, a historical piece
January 2008

In the setting of the different activities that took place during the first South American and the 55th Argentine National of Gliding Championships in González Chaves city, Argentina, there was a significant expectation for what would represent putting

the unique flying wing Horten "HO 1 B" in the air. Unique in the sense that all others are actually in museums. Such event was undoubtedly a SOLE attraction for foreign pilots and the huge audience that was there, who watched astonished.

In order to put it in good condition, the aeronautical restoration specialist Mr. Diego Roldán Knöllinger worked really hard. Mr. Knöllinger has been related to aviation most of his life, not only in Argentina but also in Europe, where he lived 18 years, (passing through Spain, Holland and England). Then, he came back to Argentina in the 2005 in order to devote his career to his specialty.

Roldan Knöllinger acknowledged he has "restored a historical element

of the national aviation, such as the flying wing, which was assembled in 1954, with the blueprints of the German engineer Reimar Horten, who had created several devices of this nature in his country".

The group that assembled it in Adolfo González Chaves, Argentina, was led by Dany Dekker, together with Francisco Fernandez, Roberto Vilches (who died in 1955 and gave the wing its name) and Felix Hetcht.

Roldán Knöllinger has been related to aviation since his childhood, starting in aero plane modeling. When he was 17 he received the Civil Pilot Brevet and was always related to AIRCRAFT and restoration assembling. Currently, he is working in the construction of a low-wing acrobatic aircraft.

The Horten 1 B flying wing restoration has been a transcended fact in terms of aviation. The German engineer assembled a similar model in 1933 that didn't turn out to be as expected. For this reason, this version is a single piece in its type. This wing has flown since its creation in 1954 to 1972 and will do so again on January 30th 2008.

Taking into account the hard work done for its restoration, Mr. Roldán Knöllinger expresses his great respect and admiration for the people who assembled it in those years, since he imagines the considerable effort demanded, mainly due to the material needed.

Based on Roberto Pla Argones' article.

This link should take directly to first flight photographs of H-1b.

<http://www.chavesdigital.com.ar/index.php?seccion=a>

[mpliar&Nota=3459&categ=nlocales>](#)

Dear Diego: Here I rewrite the links to H-IB flight video that did not appear correctly in the previous message

< <http://es.youtube.com/watch?v=-iCh5E8gLkl> >

< http://es.youtube.com/watch?v=-ah_Oa-Dd1w&feature=related >

What a thrill !!!

Here I take the opportunity to say that me and Gustavo spent a most pleasant weekend visiting the H-IB at Gonzales Chaves, and being received by you and your wife making us feel at home. What else could I ask ???

Greetings from Argentina

Fernando Walter Siarez

Great work,

When I checked my email at first it looks like a ghost for me. But when I realized it was a real Horten it felt amazing I know how much time and work a restoration uses because my father made it three times. But one thing is wondering is that it's so easy to bring an old plane back to air so easily in Argentina than in Germany.

My grandfather worked for R. and W. Horten he said to my father that he cannot imagine that one day an Original Horten will fly again.

I wish you many happy landings

Jörg Schaden
<joergschaden@gmail.com>

This Should Get the Juices Going

<http://www.flixxy.com/unusual-aircraft-takeoff.htm>

Bob Storck
<bstorck@sprynet.com>

(ed. – This is a short video clip of the SWIFT doing a foot launch.)

Some more with loops, and using an ultra light as a tow vehicle.

<http://www.youtube.com/user/airflybud>

The manufacturer
<http://www.aeriane.com/>

Rick Page
<rick-page@shaw.ca>

(ed. – There are a series of short videos of the SWIFT you can choose from once on this site.)

From Norman Masters <nmasters@acsol.net>

<http://www.youtube.com/watch?v=Y0fX2f0A2nc>

(ed. – This is a video clip of a Mitchell U-2 doing some initial test flights.)

There's a bunch of video of the SWIFT on YouTube. Including the original Bright Star promo:

<http://www.youtube.com/watch?v=PoemvgDHg0k>

The Bell Curve Math on a Spreadsheet?

Would someone comment on the availability of the math and info associated with the bell shaped lifting curve. I have read everything I can find on the net, and would really like to find a spreadsheet that does the math. I have found the Stadler math on the TWITT site.

I would like to set up the wing without winglets, and would like to avoid yaw problems if I could.

Or is there a way to accomplish the same thing with a different twist setting.

Mike Thompson
<MikeT52@roadrunner.com>

Reinhold Stadler's math is correct, as is his Fortran design code. I've heard of folks doing vortex-lattice with spreadsheets, and you could probably do the inverse solution to create a bell shaped lift curve with a spreadsheet, but I would think the complexity rather high. A better approach might be a curve fit or graphs to Reinhold's output data for various aspect ratios, sweeps, and design CL's.

Unfortunately, Reinhold has been very busy the last few years. So I am somewhat doubtful he would have the time to help us out on such a project.

But I will ask. Reinhold is the Grand Master of the bell shaped lift distribution.

Al Bowers
<Albion.H.Bowers@nasa.gov>



Scheidhauer (left) with the radio guided Ho XV scale model built by W. Schreiber (Kaltenkirchen).

I have heard that some people have used this software and a German to English dictionary. <http://mitglied.lycos.de/frankranis/> If you're not too concerned with efficiency just build it really nose heavy. If the CG is on the lateral line that crosses the 1/4 chord line at 33% span it'll fix the adverse yaw even if you use linear washout. Of course if you do it that way you pay for the nice handling with a 208% increase in induced drag. That wasn't a typo, according to section 6.3 of "Tailless Aircraft in Theory and Practice" the high twist required to support such a nose heavy plane increases the induced drag by a factor of 2.08 over the elliptical distribution.

Norm Masters

What I'm looking for is a safe platform for a 36' span powered wing. I would like to keep the speeds and weight within LSA rules. I have looked at many designs and am set on something similar to the Davis or PUL -10 in configuration. I'm not set on the exact dimensions because of the influence on flight characteristics. But something like an 8-foot root cord with a 2-foot tip cord would be a starting point.

I like the idea of a graph or curve, it makes life much simpler for people like me that are a little more math challenged. I was sure the math was too complicated for a spreadsheet, just hoping.

Mike Thompson

Facet Opal, Can Anyone Verify This Story?

If this story is true, the Facet Opal was not designed by its well known user. Can anybody check this story?

Keep that brain creative,

Koen Van de Kerckhove
<nestofdragons@hotmail.com>

Hello Koen, From kangaroo country. Thank you for a large dose of inspiration: Your informative web site just made a flying wing-nut happy.

Now for the perspiration! The Facet Opal was designed as the simplest flying wing that can be flown as an ultra-light. I know this because I drew the concept for a young enthusiast during an air show back in 1988. The fellow who built and flew my design got carried away with its performance and got a lot of publicity, but Scott did not understand the design and did not complete the under wing yaw stabilizers. The little Pelican appears to have been inspired by the Opal, and like Scott's plane it had no under-wing yaw stabilizers.

My flying wings have tips designed to create a strong vortex at high angles of attack. The lift coefficient is about four at 40 degrees. Very slow landings. All of my flying wing models changed from laminar lift to vortex lift during landing approach with a noticeable shudder. The flight is very stable, round out and trim is automatic. My first flight was down a sand hill on a folded carton of less than three square meters. A hard landing. Rectangular plan form: Try 2M by 5M. Fit in garage easily. Symmetrical wing section made from arcs of a circle. 17% thickness to chord about optimum. Sharp leading edge, reflexed trailing edge. No washout. Small elevons or conventional controls.

Best Wishes,

Lindsay of Woolli.

(ed. – This is first we have ever heard that Scott Winton was not the original designer of the Facet Opal, although there has never been a lot of information available about the design. If anyone can contribute to this, we would sure like to hear from you.)

From Curzio Vivarelli (Italy)

TWITT:

I was a member of TWITT some years earlier and I remember you like original documents of flying wings and/or aeronautics.

I am happy to send you as follows:

On Polish wings the SZD-6X Nietoperz and SZD-20X Wampir 2. *(ed. – These documents are in Polish and I think we already have copies in the archives, but none in English that I am aware of.)*

On Leonardo 2000 German flying wing and Leonardo de Vinci model at 1:3 scale by Josef Wimmer (see cover and below). *(ed. – Both of these articles are in German.)*



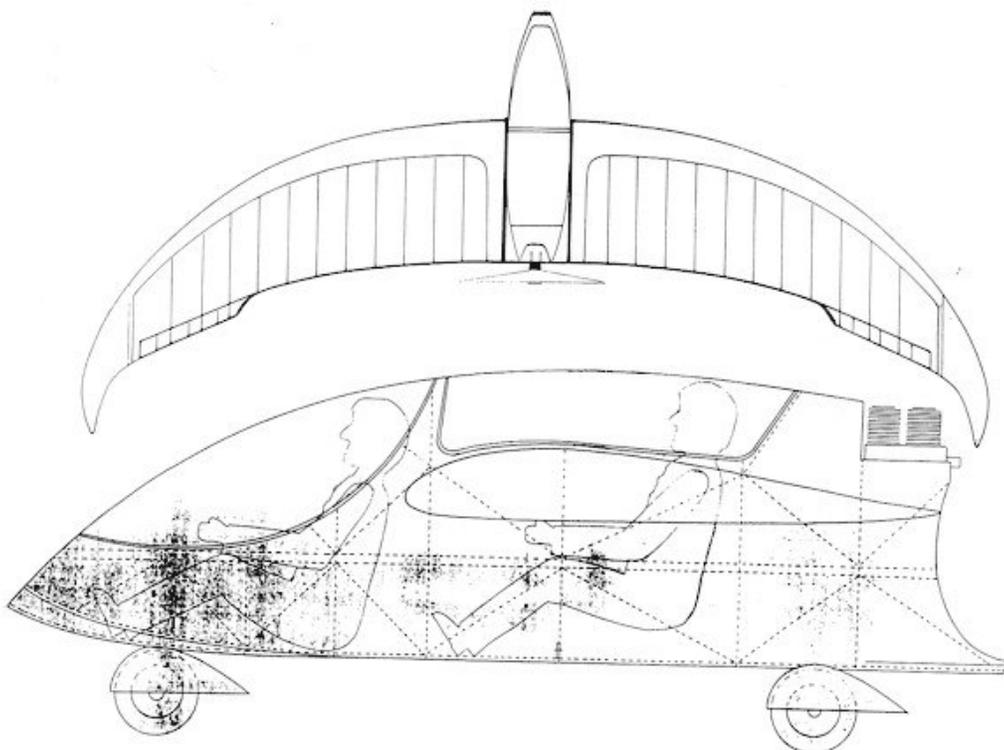
(ed. – The 3-view and specifications came from the German article by Alexander Dewald. The illustration was already in my photo library and I don't recall where or when we published it.)

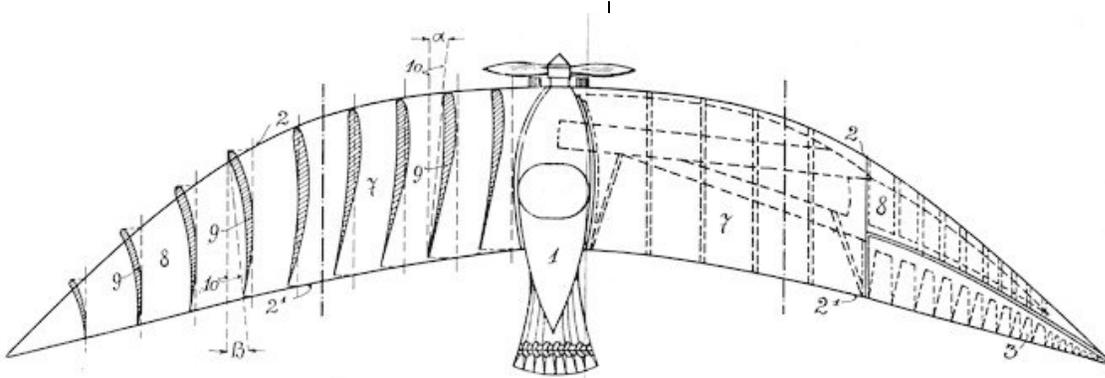
Spannweite	12,30 m
Länge ü.A.	5,30 m
Länge Rumpf	3,60 m
Höhe ü.A.	2,10 m
Höhe Rumpf	1,10 m
Leergewicht ca.	160 kg
Startgewicht max	450 kg
Tragende Fläche	18,45 qm
Motor max	80 Ps
Tankvol.	40 l
Verbrauch max	8 l/h
Steigen max	5,15 m/sec
Geschwindigkeit max	220 km/h
Min	58 km/h

Drawings by Alexander Soldenhoff

German Patent No. 24,179, A.D. 1911, Improvements in Aeroplanes. (No illustrations included) *(ed. – The text is in English and when I get a chance I will photocopy this and the others listed below and send them to Serge Krauss for his collection.)*

Wolfmuller Patent No. 13,331, A.D. 1910, An Improved Flying Machine. (Illustrations included) *(ed. – See the basic design included in one of the patent illustrations on the next page.)*





Documents on the DUNNE flying wing, 1911. (ed. – An article from The Aeronautical Journal, January 1911, “The Dunne Biplane, Report on Automatic Stability Trials”. “Mr. Griffith Brewer and Mr. Orville Wright have jointly observed on behalf of the Aeronautical Society, the trials made by Lieut. J.W. Dunne for the purpose of demonstrating the automatic stability of his biplane.”)

“The Theory of Dunne Aeroplane” by J.W. Dunne, published in The Aeronautical Journal, April 1913, with illustrations. (Article in English)

Documents on Wilber Wright, 1911. (ed. – A personal reflection by Griffith Brewer on the death of Wilbur Wright as published in The Aeronautical Journal, July 1912.)

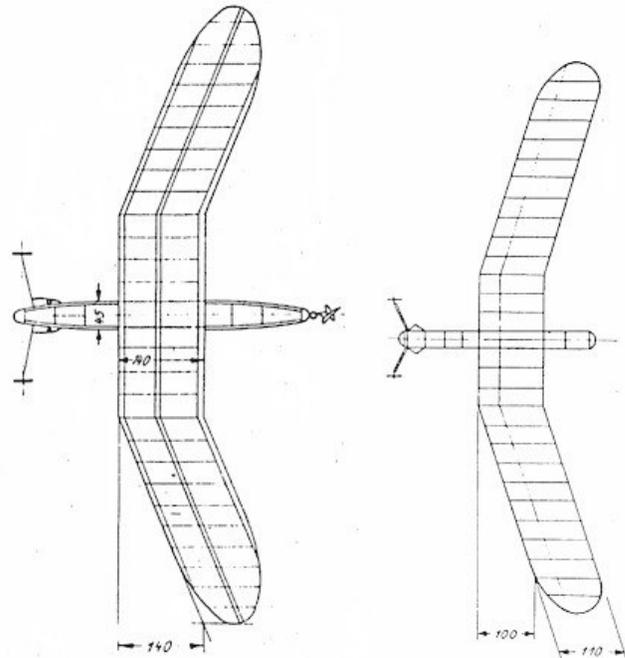
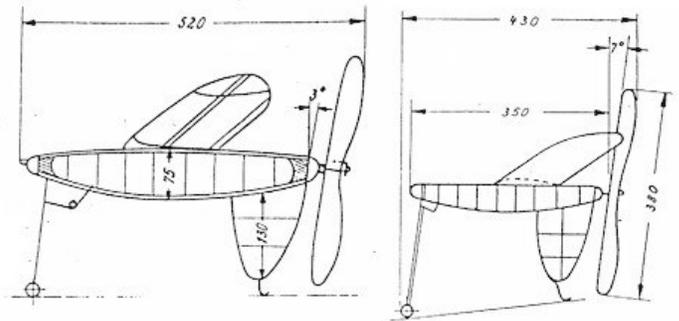
Article on the Pterodactyl as published in Flugsport in 1921. (Article is in German.)

Article by Karl Steiger, 1920, Flugsport, on his bird like flying wing. (Article is in German)

Article by E.J. Marey on his experiments on aerodynamics with photos as published in Institut de France, June 1901. (Article is in French)

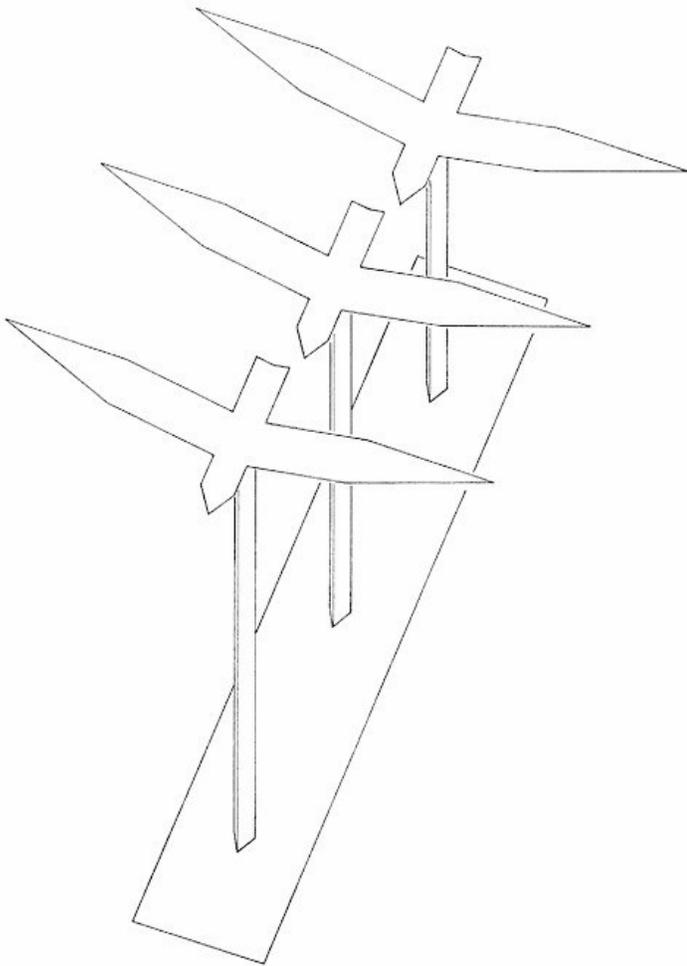
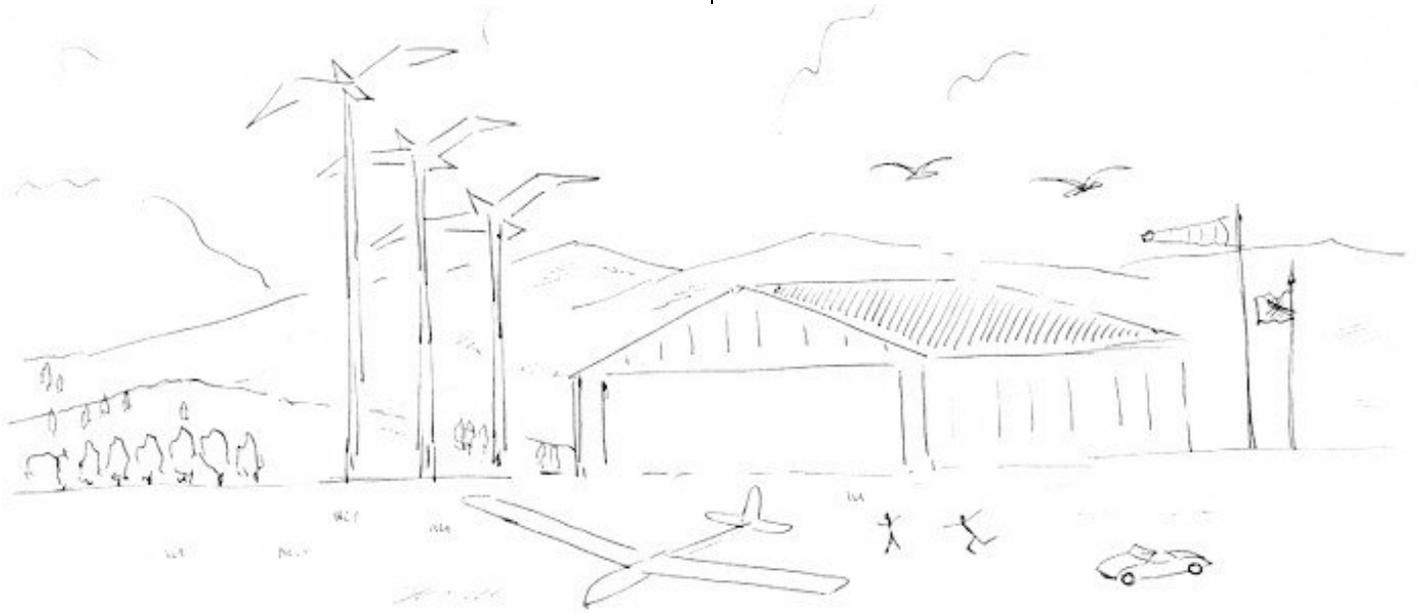
Photos from original drawings of E.J. Marey. (ed. – These are not very clear but appear to show progressive drawings of bird flight as the wing changes configuration.)

Project of flying wing model from 1940 Germany with a rubber motor. (ed. – Drawings titled “Nurflügel-Gummimotor-Flugmodell” and “Schwanzloses Flugmodell mit Gummimotor” by Fred Militky some samples shown to the right.)

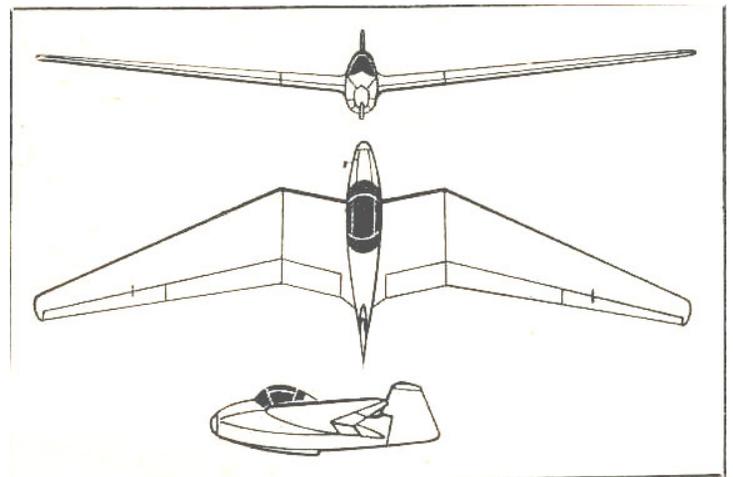


Drawing of my projected (giant) architecture for airports or sailplane clubs . . .(or yachting clubs).

PS – If any TWITT members would like to write me here is my address: Curzio Vivarelli, via Scrimiarì 52, I-37129 Verona ITALY (kvr_viv@yahoo.it).



(ed. – This is something that would look good outside of Jeff Byard's hanger at Tehachapi and perhaps be allowed to vane into the wind like a windsock.)



3-view of the Polish Nietoperz



Facet Opal mentioned in an earlier letter

AVAILABLE PLANS & REFERENCE MATERIAL

Coming Soon: Tailless Aircraft Bibliography Edition 1-g

Edition 1-f, which is sold out, contained over 5600 annotated tailless aircraft and related listings: reports, papers, books, articles, patents, etc. of 1867 - present, listed chronologically and supported by introductory material, 3 Appendices, and other helpful information. Historical overview. Information on sources, location and acquisition of material. Alphabetical listing of 370 creators of tailless and related aircraft, including dates and configurations. More. Only a limited number printed. Not cross referenced: 342 pages. It was spiral bound in plain black vinyl. By far the largest ever of its kind - a unique source of hardcore information.

But don't despair, Edition 1-g is in the works and will be bigger and better than ever. It will also include a very extensive listing of the relevant U.S. patents, which may be the most comprehensive one ever put together. A publication date has not been set yet, so check back here once in a while.

Prices: To Be Announced

Serge Krauss, Jr. skrauss@earthlink.net
 3114 Edgehill Road
 Cleveland Hts., OH 44118 (216) 321-5743

Books by Bruce Carmichael:

Personal Aircraft Drag Reduction: \$30 pp + \$17 postage outside USA: Low drag R&D history, laminar aircraft design, 300 mph on 100 hp.

Ultralight & Light Self Launching Sailplanes: \$20 pp: 23 ultralights, 16 lights, 18 sustainer engines, 56 self launch engines, history, safety, prop drag reduction, performance.

Collected Sailplane Articles & Soaring Mishaps: \$30 pp: 72 articles incl. 6 misadventures, future predictions, ULSP, dynamic soaring, 20 years SHA workshop.

Collected Aircraft Performance Improvements: \$30 pp: 14 articles, 7 lectures, Oshkosh Appraisal, AR-5 and VMAX Probe Drag Analysis, fuselage drag & propeller location studies.

Bruce Carmichael brucecarmichael@aol.com
 34795 Camino Capistrano
 Capistrano Beach, CA 92624 (949) 496-5191



VIDEOS AND AUDIO TAPES



(ed. - These videos are also now available on DVD, at the buyer's choice.)

VHS tape containing First Flights "Flying Wings," Discovery Channel's The Wing Will Fly, and ME-163, SWIFT flight footage, Paragliding, and other miscellaneous items (approximately 3½+ hours of material).

Cost: \$8.00 postage paid
 Add: \$2.00 for foreign postage

VHS tape of Al Bowers' September 19, 1998 presentation on "The Horten H X Series: Ultra Light Flying Wing Sailplanes." The package includes Al's 20 pages of slides so you won't have to squint at the TV screen trying to read what he is explaining. This was an excellent presentation covering Horten history and an analysis of bell and elliptical lift distributions.

Cost: \$10.00 postage paid
 Add: \$ 2.00 for foreign postage

VHS tape of July 15, 2000 presentation by Stefanie Brochocki on the design history of the BKB-1 (Brochocki, Kasper, Bodek) as related by her father Stefan. The second part of this program was conducted by Henry Jex on the design and flights of the radio controlled Quetzalcoatlus

northropi (pterodactyl) used in the Smithsonian IMAX film. This was an Aerovironment project led by Dr. Paul MacCready.

Cost: \$8.00 postage paid
 Add: \$2.00 for foreign postage

An Overview of Composite Design Properties, by Alex Kozloff, as presented at the TWITT Meeting 3/19/94. Includes pamphlet of charts and graphs on composite characteristics, and audio cassette tape of Alex's presentation explaining the material.

Cost: \$5.00 postage paid
 Add: \$1.50 for foreign postage

VHS of Paul MacCready's presentation on March 21, 1998, covering his experiences with flying wings and how flying wings occur in nature. Tape includes Aerovironment's "Doing More With Much Less", and the presentations by Rudy Opitz, Dez George-Falvy and Jim Marske at the 1997 Flying Wing Symposiums at Harris Hill, plus some other miscellaneous "stuff".

Cost: \$8.00 postage paid in US
 Add: \$2.00 for foreign postage

VHS of Robert Hoey's presentation on November 20, 1999, covering his group's experimentation with radio controlled bird models being used to explore the control and performance parameters of birds. Tape comes with a complete set of the overhead slides used in the presentation.

Cost: \$10.00 postage paid in US
 \$15.00 foreign orders

FLYING WING SALES

BLUEPRINTS - Available for the Mitchell Wing Model U-2 Superwing Experimental motor glider and the B-10 Ultralight motor glider. These two aircraft were designed by Don Mitchell and are considered by many to be the finest flying wing airplanes available. The complete drawings, which include instructions, constructions photos and a flight manual cost \$140, postage paid. Add \$15 for foreign shipping.

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