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JULY 2014

T.W.I.T.T. NEWSLETTER



A conceptual image of Koen Van de Kerchove's Bird Glider. For more information use the link below.

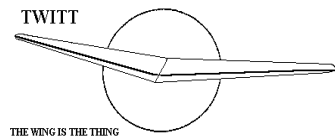
<http://www.nestofdragons.net/weird-airplanes/few-of-my-thoughts/the-bird-glider.aspx>

T.W.I.T.T.

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



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**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.

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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).

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PRESIDENT'S CORNER

My thanks again to Jim Loyd for such a wealth of material to include in a series of short descriptions of his project. I have included a second piece this month and I think there is enough for a couple more issues unless I don't have anything else come in.

This month I received some great images from John Newton on his flying wing model along with a short piece on how well it performs. He didn't include any specifications, but perhaps we will hear more from him as he gains experience with the flying characteristics.

Lots of pictures this month, which I know you all enjoy.

Now that the summer is upon us I am hoping to see more e-mails and pictures from our members as they play with the experiments they built over the winter. John's submission is a good example of what can be sent in to share with the other members. If you happen to be a little more technically inclined and want to provide more details, like specifications or drawings, please do so.

I hope everyone is having a great summer so far. I haven't had a chance to fly my glider as much as I would like, but hope that is going to change in the weeks ahead as the summer flying season matures in my area.



LETTERS TO THE EDITOR

(ed. – This what I think is the final comments by John Gibson in his and Gavin Slater's ongoing conversation on lift theory and circulation. Gavin my have a response in the future, but there wasn't enough time before publishing this issue for him to formulate one.)

Re: Lift theory

Nothing whatever in my replies to Gavin Slater's opinion that circulation has no involvement in lift creation implies anything about what he may know about it, but they are certainly a rebuttal. Also, they are not my own personal opinions but are culled from many reputable aerodynamics sources of the past century describing its original derivation and its continued developments to the present day, not to mention my 50 years employment and association in and with an advanced manufacturer's aerodynamics department. No other "explanation" has ever been promoted and proved in such sources, however often they are repeated in piloting circles etc.

Gavin omitted to include the short discussion about circulation in his referenced J D Anderson source, but the many pages in Anderson's "A History of Aerodynamics" (1997) include the following comments:

(On Lanchester's circulatory flow concept in the 1890s) "... a scientific breakthrough in our understanding and calculation of aerodynamic lift."

(On the 1906-1910 Kutta/Joukowski Lift Theorem) "... the essence of the circulation theory of lift, composed of elements from the thinking of Lanchester, Kutta and Joukowski. It provided the foundation for all theoretical aerodynamics for the first 40 years of the 20th century. (It) is still alive and well ... and is still evolving today, 90 years after its introduction." (Now 100 years.)

(On Prandtl's 1918-1919 lifting-line extension of two-dimensional theory to finite wings, and hence to the span wise lift distribution, trailing vorticity and downwash which causes reduction in lift and induced drag) "... Airplane designers now have sophisticated and highly detailed computer programs for accurate calculation of the aerodynamic properties of wings, but Prandtl's lifting-line theory still has its uses."

In the light of the above, the remarks quoted by Gavin that "the circulation theory is sometimes given for the source of lift. However, this turns out to be not so much an explanation of lift *per se*, but rather more of a mathematical formulation for the calculation of lift for an airfoil of given shape" are arguable. Lanchester's original conception did not require mathematics to see what he meant. More detail description of the whole mechanism of lift is needed to explain it, but nothing in that is hard to follow even if nobody could understand how this could work at the time. Certainly the full maths is far from simple but it is not the theory itself. It is only an engineering tool to make use of the theory.

Other "explanations" of lift littered about in the aviator's world are assertions, unsupported by theoretical or experimental evidence and kept alive only by the faith of their proponents.

John Gibson
7/2/2014 10:35 PM

I found an interesting link from page 10 of the WingsandWheels.com want ads. The seller is trying to sell his motorized version of a Swift for 22K, but he has a link that talks about the development of the Swift,

<http://aero.stanford.edu/reports/swiftarticle1991.html>



He also has a video of his trailer, which has a crane for each wing to assist in assembly.

<http://www.wingsandwheels.com/want-ads10.htm>

<https://sites.google.com/site/brightstarswift/>

Thanks,

Clyde Revilee

(ed. – Even if you aren't interested in buying something like this, it is worth viewing the videos to see what lengths this person went to in designing the trailer for one-man assembly. There are also some taxiing and flying video that show the aircraft's performance.)

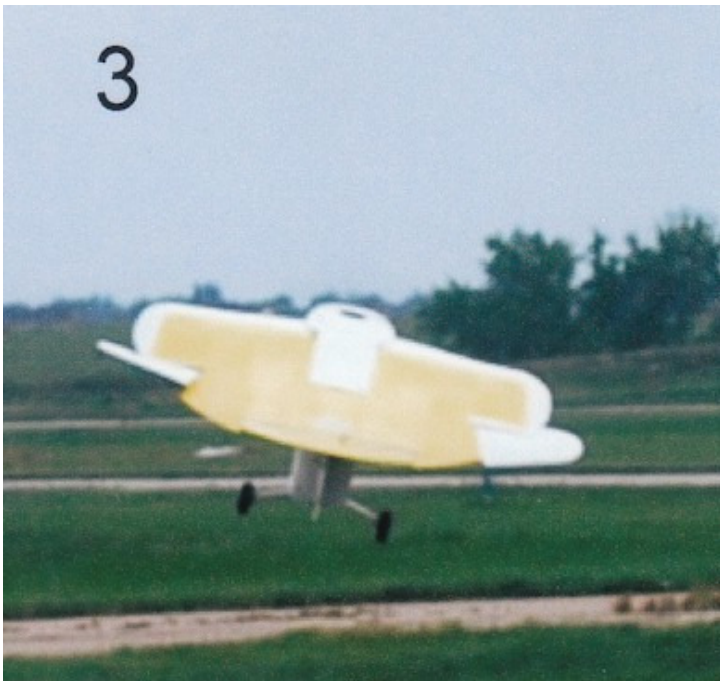
(ed. – This is a continuation of Jim Loyd's model experiments started last month. There is still more to come next month.)

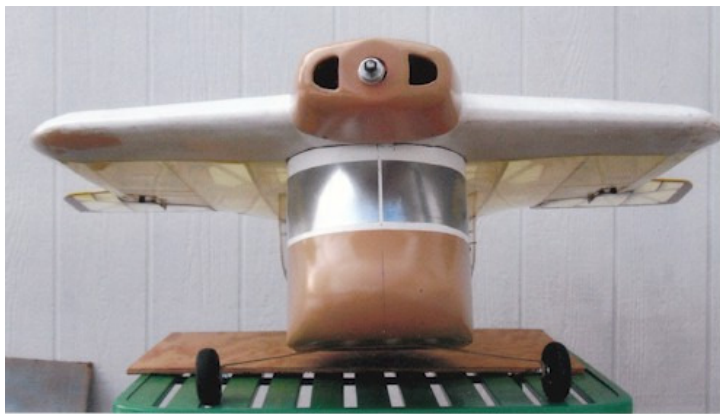
The photo at the top of the right column shows me (5'11") and one of my 14' center section ribs. It's made of wooden molding stock from Lowes. It weighs 7 pounds. I experimented with several combinations of aluminum angle, tubing and sheet. They all weighed around 4 pounds.

The series of shots numbered 1 to 6 shows the consequences of an uncontrolled testing urge. The model I launched was a very good flyer. I wanted to test some mods of the rudder and change of thrust line. A line of thunderstorms had invaded the calm afternoon while we were preparing the model. Curiosity over came rationality and we launched into gentle gusty conditions. Halfway through its takeoff run a 'gentle' gust yanked the model into the air and blew it off the runway where it stalled and crashed into a large puddle. As an EAA inspector I had witnessed such irrational 'builder' behavior several times, always assuming I would never succumb. I'm a bit humbler now.

The next series (*next page*) of photos shows the "side by side" (Mk 9) pod and dual Rudders that I attached to the original wing configuration. It flew pretty well but it was obvious that the increased weight and removal of 30% of the wing by the wider pod turned it into a 'lead sled'.







(ed. – My thanks to John for sharing his experience. I have included the photos that best show off John's design. Please submit any questions you might have through me so I can share them and the answers with the rest of the group.)



Just thought I would send some pictures of my latest design in flight should you wish to use them in the Newsletter, My wing is a 1.32m wingspan Horten style model with a Bell Shaped Lift Distribution across the wing and tip elevons for control, it weighs 490g and has a small pusher prop for power.

The model has no fins and no artificial stabilization (no gyros etc.), it is stable and controllable. I am very pleased to report that no adverse yaw is apparent when rolling/turning the model meaning that I am able to fly coordinated turns with no rudder control whatsoever (the model is only fitted with outboard elevons, 1 per side).

The model seems pretty maneuverable, certainly comparable with a similar sized model of conventional layout, and the power off glide is good when considering the relatively low aspect ratio.

If you want any further information please don't hesitate to contact me. Best regards,

John Newton
 Technical Advisor, University of Derby,





(ed. – I got an e-mail from Stefanie Brochocki just as I was finishing putting this issue together. One of the things she was asking about a fatal accident with a restored BEKAS flying wing in Poland. From what I can find on the Internet, it occurred on November 17, 2013 at Turbia Airfield during the initial takeoff since the restoration. The link below has more information but it is in Polish so I am not quite sure what it is covering. There is also a single photo from a distance of the glider.

<http://www.nowiny24.pl/apps/pbcs.dll/article?AID=/20131117/STALOWAWOLA/131119682>

If anyone could translate some of this information or provide more details you might have come across through other resources, I would appreciate it.)



Maybe you recall my Bird Glider proposal on my website. <http://www.nestofdragons.net/weird-airplanes/few-of-my-thoughts/the-bird-glider.aspx> Well, I made the decision to see with some engineers if it is possible to make it ... for real ...full size ...manned. Is it flying wing enough to be discussed here?

In the Files section in folder "Nest of Dragons thoughts", you can find a few drafts of me. It is the basic idea. Totally no calculations done. Just my rough thoughts. I am curious where it will lead me to. The feathers are fixed. The tail goes up and down (1/4 chord of it) and yaw/roll is done by spoilers. I hope to keep the main wing to a limit of 6m long and 1.6m wide.



Koen Van de Kerchove

AVAILABLE PLANS & REFERENCE MATERIAL

Tailless Aircraft Bibliography

My book containing several thousand annotated entries and appendices listing well over three hundred tailless designers/creators and their aircraft is no longer in print. I expect *eventually* to make available on disc a fairly comprehensive annotated and perhaps illustrated listing of pre-21st century tailless and related-interest aircraft documents in PDF format. Meanwhile, I will continue to provide information from my files to serious researchers. I'm sorry for the continuing delay, but life happens.

Serge Krauss, Jr. skrauss@ameritech.net
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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.

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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 \$250 US delivery, \$280 foreign delivery, postage paid.

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