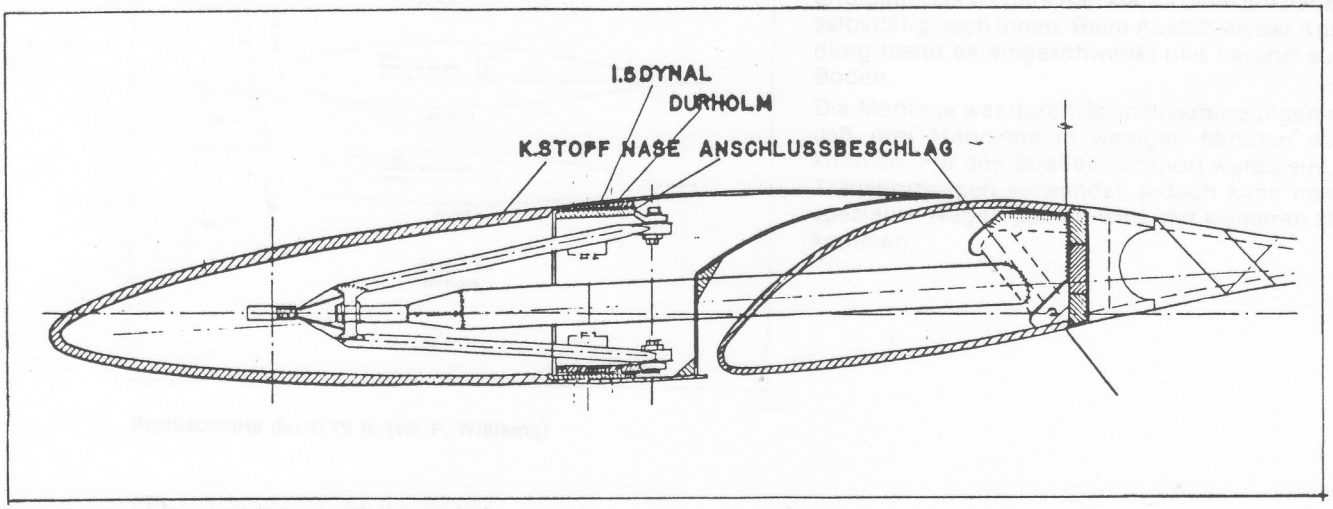
No. 378 JANUARY 2018

T.W.I.T.T. NEWSLETTER

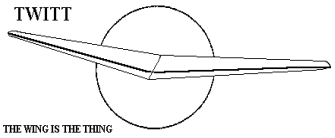


Crossection of the H IV b wing with the control.

Horten IV wing cross section showing the control mechanism.

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., **1801** means this is your last issue unless renewed.



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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Wt/#Issues	FRG	AUSTRALIA	AFRICA
1oz/1	1.75	1.75	1.00
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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 to our regular members and a couple of new inquiries for providing material for this month's newsletter. Some interesting things.

I guess we should be flattered that there are people out there that think TWITT is some type of giant entity that is designing and/or building flying wing aircraft. That appears to be the case around the first letter to the editor on the next page. I get these every now and then but when I reply that we are just a small group of aviation enthusiasts with a limited treasury they never reply.

I note below that I thought Don Mitchell's aileron system was very similar but I also think that the Hortens really beat him to the concept. Compare the pivot point of the IV aileron on the cover with the pivot of Mr. Morris' patent diagram. It appears to me that the idea is to get the leading edge of the aileron down into the airflow which would help prevent adverse yaw. Now I may be wrong in my thinking but I am not an aero engineer to could be really off base here. If so, please let me know so I can learn what is really happening here.

NOTE: I noticed I didn't update the issue number in December, which should be No. 377 and not No. 376 that is for November.

That's it for this month.

Andy

LETTERS TO THE EDITOR

(ed. - I received this proposal late last year and responded with an inquiry for more information relative to what type of financial support TWITT would have to provide to participate. I haven't received a reply yet so assume that we don't meet his criteria for joining in on this venture. I have included a reduced version of the patent but I know the text will be hard to read. However, the diagram is obvious on how this should work and my first thought was it is an adaptation of Mitchell's dropped aileron on his designs that were to prevent adverse yaw. I you have any thoughts on this design, please let me know since I am not the best person to do a proper analysis.)

Dear Wing Thingers;

Please consider my patent (Page 1 attached, right column). I set out to develop a system to yaw tailless aircraft, and discovered a safety feature which prevents a drop-wing stall from becoming a tail spin due to instinctual yoke input (see Abstract in the attached).

I have pledged 10% of proceeds from the sale or license of this patent to the Academy of Model Aeronautics. Would TWITT accept 10% in exchange for your interest and publication?

Two aircraft manufacturers have responded, with estimates of $15 - $25 millions to design, develop and secure certification for a new aircraft equipped with my "Safety Aileron System," and nearly that much to redesign, test and re-certify an existing aircraft. It's not exactly a bolt-on device.

My tests were conducted using remote controlled flying models with wing spans of 5.0 to 6.0 feet, consisting of both conventional and tailless (canard) configurations.

Best regards,

Ralph Morris,
N6UFB
AMA 134119
FAA FA3KX4F9T9 FA

Andy,

Thanks for sending me the info for the members section. Lots of info in all those back issues. I'm sure I'll spend hours perusing them!

I saw the note about an unresolved case ID, I checked and there was nothing in the resolution center.. Do you know something I don't?

As far as a story, as you may know Zagi makes R/C flying wings so a membership in TWITT seemed imperative! I hope to be able to gain and give as much as possible.

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(12) **United States Patent**
Morris

(10) **Patent No.: US 9,038,943 B1**
(45) **Date of Patent: May 26, 2015**

(54) **SAFETY AILERON SYSTEM**

(71) Applicant: **Ralph F. Morris**, Glendale, AZ (US)

(72) Inventor: **Ralph F. Morris**, Glendale, AZ (US)

(*) Notice: Subject to any disclaimer, the term of this patent is extended or adjusted under 35 U.S.C. 154(b) by 0 days.

(21) Appl. No.: **14/316,260**

(22) Filed: **Jun. 26, 2014**

Related U.S. Application Data

(60) Provisional application No. 61/978,566, filed on Apr. 11, 2014.

(51) **Int. Cl.**
B64C 9/00 (2006.01)
B64C 13/04 (2006.01)

(52) **U.S. Cl.**
CPC . ***B64C 9/00*** (2013.01); ***B64C 13/04*** (2013.01); *B64C 2009/005* (2013.01)

(58) **Field of Classification Search**
USPC ..... 244/90 R, 215, 217, 216, 213, 225
See application file for complete search history.

(56) **References Cited**

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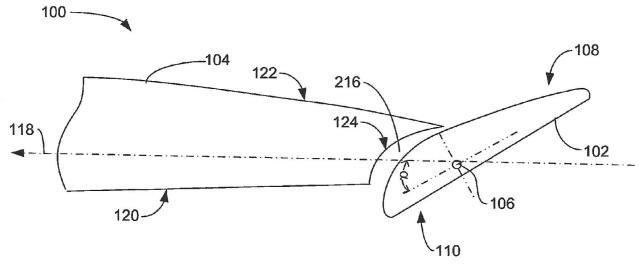
* cited by examiner

Primary Examiner — Christopher P Ellis
(74) *Attorney, Agent, or Firm* — Keith L. Jenkins, Registered Patent Attorney, LLC; Keith L. Jenkins

(57) **ABSTRACT**

Individually operable ailerons pivotable to extend a forward end below a bottom wing surface and a rearward end above a top wing surface. The extended aileron forward end increases drag and subsumes the rudder function in the turn, while the aileron rear end produces drag and airflow redirection to reduce lift on the wing. The advantage of the safety ailerons is that habitual or instinctive pilot inputs to the yoke will recover from a dropped-wing stall at low speed and altitude, while conventional ailerons require counter-intuitive pilot actions to avoid crashing in such conditions.

18 Claims, 4 Drawing Sheets



Our Founder Jerry Teisan sold the company to us last year and we have been selling wings of his original design. Lately we have been talking about developing a new product but with no aero designers on staff are left to look at what is going on in the world of wings. To date this has been a very interesting experience! I hope to have a really exciting product here in the next few months! We are making molds now and will send prototypes out to a few customers for testing and evaluation purposes before the new year. I'm still trying to wrap my head around the

intricacies of flying wings and how to defeat the few common inherent weaknesses.

Best Wishes!

Josh
Zagi, LLC
zagi.com

Dear Andy!

A Merry Christmas for you and the whole TWITT community!

This years end is coming fast.

After a year full of interesting experiences and changes some more quiet days are expected. Memories can be revisited and be taken into the New Year.

Maybe you too will use the Christmas holidays for some long planned visits. To see a few good friends. To have some time to be spent for hobbies (flying wings!!). Or to meet with the family.

I wish you all a pleasant Christmas time and a good start into 2018!

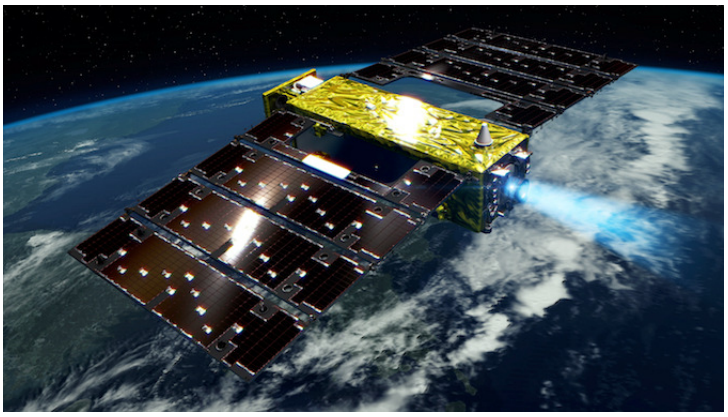
With best wishes, your

Reinhold Stadler

(ed. - We always get a Christmas message from Reinhold with an accompanying cartoon image but it comes in too late for the December issue. So here it is although a little late.)

Hello Andy,

This vehicle may be stretching the definition of "tailless aircraft" to the breaking point :-) , (see: http://spaceflightnow.com/2017/12/22/h2a-f37-launch-coverage/) but a satellite launched last week by Japan, called Tsubame ("Swallow" [like the DH 108...]—its official name is SLAT, for Super Low Altitude Test Satellite), is designed like one. Planned for operation in a very low (between 111 and 166 miles) orbit, Tsubame is designed with aerodynamics in mind, and it is equipped with an ion engine, whose low but continuous thrust will counteract the slight but constant aerodynamic drag at those altitudes. (The European Space Agency's Gravity Field and Steady-State Ocean Circulation Explorer [GOCE,



see: http://en.wikipedia.org/wiki/Gravity_Field_and_Steady-State_Ocean_Circulation_Explorer] satellite was also ion-propelled and "grazed" the outer edges of the atmosphere, and it was shaped like a dart for aerodynamic reasons.) These satellites are conceptual heirs of Dr. Kraft Ehricke's "satelloid" idea

(see: www.google.com/search?q=Kraft+Ehricke+satelloid&nfpr=1&sa=X&ved=0ahUKEwjT7PnBpafYAhVC4GMKHXvoCzUQvgUIJSgB&biw=1440&bih=794)

—a delta-winged rocket plane that would fly a "supported orbit" or "forced orbit" about 90 miles up, powered by either a tiny rocket engine, an ion thruster, or even an "ionospheric ramjet" (which would convert monatomic oxygen into diatomic oxygen by means of a catalyst screen in order to produce thrust, potentially enabling unlimited flight durations). Also:

Another, indisputably tailless *aircraft*, Boeing's MQ-25 is competing to become an unmanned tanker for U.S. Navy service. It's interesting how the tailless

(see: http://www.spacedaily.com/reports/Boeing_unveils_entry_in_unmanned_aerial_tanker_competition_for_the_Navy_999.html),

configuration has proved so popular for UAVs, including carrier-based ones such as Northrop Grumman's X-47B

(see: http://en.wikipedia.org/wiki/Northrop_Grumman_X-47B).

I hope this material will be helpful, and Happy Yule!

Jason Wentworth

Hi Andy,

Thanks for the message of welcome. I made model aircraft as a kid, though the very fragile nature of them did rather discourage me by the end! I've been a boat builder and a math teacher and now I'm retired and among other projects I am interested to make an aircraft with a delta or swept back wing which can take off and land at high alpha without needing to use flaps, but still cruise efficiently at low alpha.

I want to discover whether the onset of stall in a delta wing can be delayed by mounting a row of propellers above and slightly forward of the trailing edge. The idea being to encourage the flow after the separation bubble to reattach and remain attached, later than it would with no props.

I have this mental picture that the leading edge vortices on a delta which roll up and flow outwards towards and beyond the tips have a low pressure core which sucks air from the top of the wing and probably delays stall by sucking the separation bubble down. Using the propulsion airflow to do the same thing might make it possible to fly reliably at even higher angles of incidence and thus lift coefficient.

Separately I have read about Willard Custer and his Channel-wing, and I made a model setup with a semicircular channel beneath a 6 inch prop turned by a brushless motor. The motor and propeller were mounted on a fixed bar and the channel was sitting on a letter scale so I could measure its weight. With some ballast the letter scale read 136g at zero revs but 103g at full revs. i.e. 33g of vertical lift was acting on the channel. The motor + prop generated 100g thrust at full revs, so having a third of that as lift is a worthwhile gain.

I am hoping to incorporate a series of channels , maybe not semicircles but 1/3 circles, on the top wing surface a little forward of the trailing edge to maximize the channel wing lift, as well as delay stall, so as to make a STOL delta. My early experiments show that I'm not too good at RC flying so I think I need to make and fly a trainer first.

The TWITT site does seem to have a lot of knowledge of the sort of wings I'm interested in, and also points to the idea that all the good ideas are not yet discovered despite the popularity of the Tube and Wing planes.

Cheers,

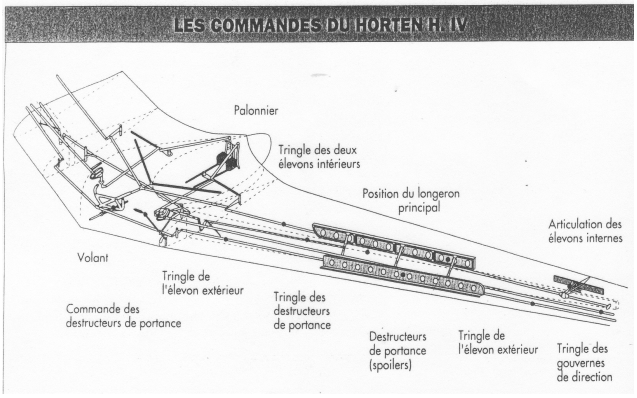
Topher Dawson.

ed. - I am sure Topher would appreciate any input from the members that would help in his search for answers on how to proceed with his project.)

(ed. - The rest of this issue contains images taken from various places on the Internet that correspond to the same ones from the Horten IV article presented in the past two issues. They are not in any particular order and I have added labels when I could determine what to place under the image.

There are a great number of pictures of the Horten IV on the Internet by just searching with a query like "Horten IV Images." It appears there are allot of duplications and I think many of them are probably in the public domain due to this duplication. So, if you would like to see more on the historic part of this sailplane and where there are modern display versions throughout the US and Europe.)

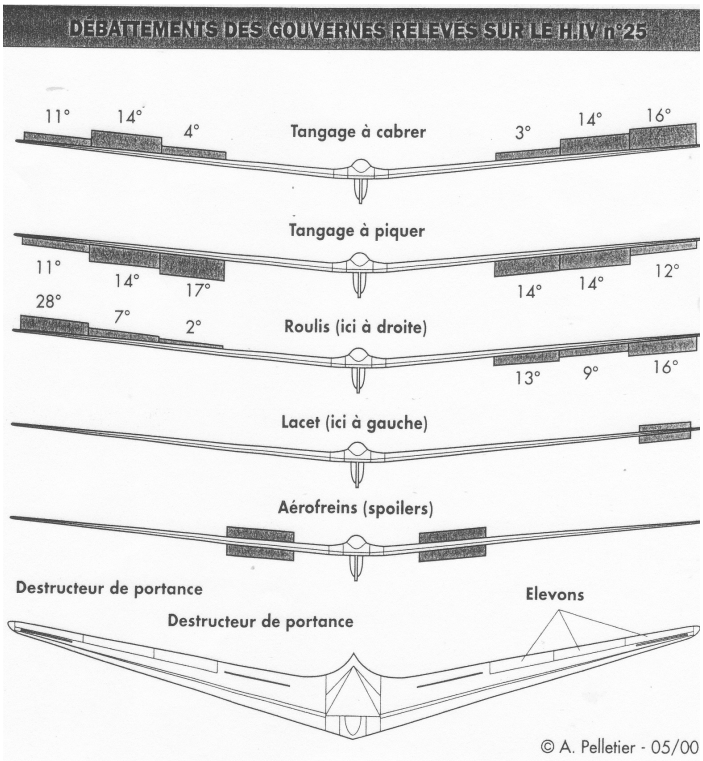
Dez George-Falvy standing in front of the H IV at Mississippi State during a flight test program.



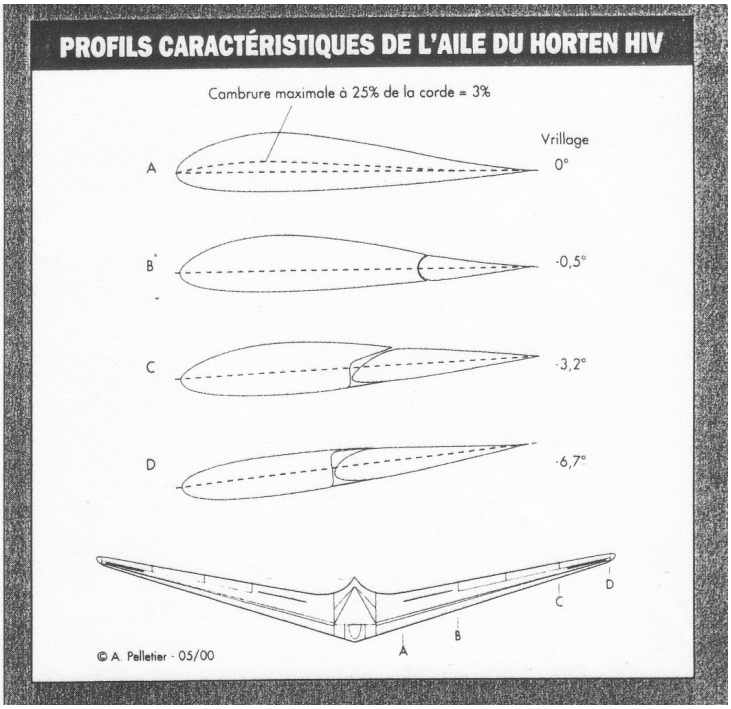
Above/Below: Dez George-Falvy in the flying position.

This is the magazine cover for the article along with the original image that made up the background.

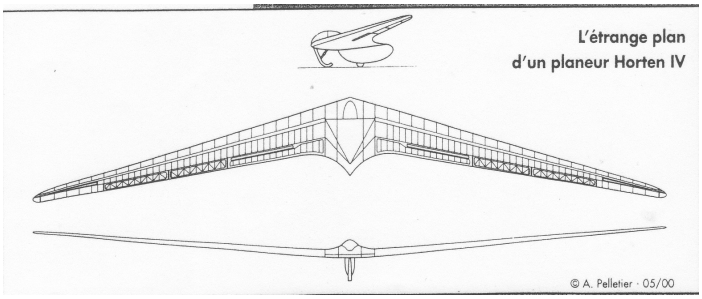
(ed. - I find it interesting that what appear as P-47s were chasing a glider rather than something like the Ho 229 powered flying wing.)



This shows the various control surface deflections that were designed do eliminate or minimize adverse yaw.



This is an illustration showing the wing profile characteristics.



Typical 3-View.

This is one of the new display versions of the H IV but is similar to an image in the article. As far as we know none of the restored aircraft are in flying condition, but there may be some new construction airframes being worked on that we are not fully aware of at this time.

AVAILABLE PLANS & REFERENCE MATERIAL

VIDEOS AND AUDIO TAPES

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

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 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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Make checks payable to: Experimental Soaring Association, & mail to Murry Rozansky, Treasurer, 23165 Smith Road, Chatsworth, CA 91311.

(ed. - You may have noticed that the ad for Serge Krauss' tailless bibliography has disappeared. He is reevaluating how he wants to proceed with this project along with other interests he has for enjoying retirement. I think he will have a new message for members in next month's newsletter.)