No. 274 APRIL 2009

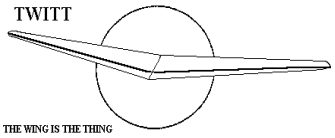
T.W.I.T.T. NEWSLETTER

This is a side view of Jim Loyd's low aspect ratio R/C model in its original configuration. You can read more about inside and in the March 2006 issue of the TWITT Newsletter.

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., **0904** means this is your last issue unless renewed.

Next TWITT meeting: Saturday, May 16, 2009, 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

I am pleased to note that we are slowly growing again with a few new members over what I reported last month. It seems that people visiting the web site are becoming more interested in flying wings and want to learn more. This is a great trend.

There are some interesting links in this issue that came off of the Nurflugel bulletin board. They show some interesting ideas from the past and if you search around a little you will probably find some futuristic ideas as well.

Jason Wentworth has also provided a lot of additional material that I will introduce in small spurts along with whatever you guys see fit to send in. I still depend heavily on everyone to provide links, articles and pictures to put each issue together, so keep those cards, letters and e-mails coming.

Jason also contacted some of his rocket wing suppliers and got them to send us some sample kits. We have two of them that we will put together in the coming weeks when the airplane cleanup project we are working on goes to the upholstery shop. Once done we will take some before pictures just in case they don't make it through the first set of gliding test flights. I don't imagine we will actually try any rocket launches due to the restricted area we have to work with on the airport.

For those of you on the east coast, if you are interested in going to an aviation symposium, there is the Experimental Soaring Association's Easter Workshop being held at the Wurstboro, NY airport. This is a great event with both technical presentations by some very knowledgeable aerodynamicists, hands on sessions with various types of sailplanes and, the ability to take a glider ride through the airport FBO. The dates are June 26-28, 2009 and more information can be obtained through the ESA web site at: http://www.esoaring.com/

LETTERS TO THE EDITOR

March 12, 2009

I am enclosing $20 with this letter for my renewal for another year. Completely skipped my mind. Work is running me ragged.

Couple of questions. Have you seen the article on the Geobat? Second, is there a wing that will go rally fast, like as "blister the air"?

Mel Avery
Orange Park, FL

(ed. – Haven't seen the article but did find Geobat on the Internet and figure this is what you are talking about. I think the concept has been around for a long time but perhaps not very practical as private plane. The advent of multi-functional R/C radios have also made the electronic control mixing possible to maintain better control. Here are a couple of pictures from http://www.geobat.com/ for those of you who don't have a link to the Internet.

As for fast flying wings, I seem to recall some statements that there would never be a supersonic wing due to the aerodynamic limitation of the design. So blistering the air may not be in the future.)

Father and son builders of the world's first ¼ scale Geobat! Carey Rawls (left) and Mike Rawls (right).

March 14, 2009

Just got my March newsletter today. It was an interesting follow-up to the February issue. I remember Terrence O'Neill's "Pea Pod" from the homebuilt and enthusiasts magazines of nearly half a century ago, and have read a couple of his tailless aircraft related articles since then. Here he is again with a book - perhaps the only researched publication by anyone not biased in the dispute - on one of the most exasperating conflicts since Wright vs. Curtiss, et. al. It's great to see such knowledge and enthusiasm applied to preserve our history.

Thanks.

Serge Krauss
<skrauss@ameritech.net>

(ed. – It is interesting that some people persist over the years and continue to make contributions to the aviation world.)

March 14, 2009

Somewhere in the online TWITT archives of a few years back is a letter from a guy who says he designed Scott Winton's Facet Opal, and that Winton deviated from the plans. I was rummaging around in the archives when I first subscribed to TWITT a few weeks ago, and came across this letter. Now, I can't seem to find it.

If you have computer indexing of such, could you please let me know which TWITT edition had that letter, or simply cut and paste it for me?

Thanks, and also thanks for my first TWITT hardcopy, which showed up today.

Bart Brown
<bartbrown08@gmail.com>

(ed. – I have a partially complete index, but the references didn't locate anything other than what I have below. Sorry I couldn't be of more help in finding the reference you obviously came across in an issue.

There is a letter in the August 2003 on page 8 about trying to find out information about the crash, but nothing about the being the designer.

There is someone asking for plans in the January 2007 issue. The June 2006 issue has someone asking for specifications.

There was a letter referencing something in 2000, but I couldn't find the letter you were looking for in the 2000 issues.

Strange thing just happened. Check out the guest book section of the web site. I just approved the post of exactly what you are looking for and an e-mail link to who you want to talk with. Here is the e-mail address from the guest book. Good luck and thanks for the additional information in your other e-mail. linolen@sctelco.net.au Please let me know what you find out so I can share it in the newsletter.

The guest book entry was:

> *"I have studied flying wings for many years and built numerous flying models. Scot built and flew the Facet Opal from a design that I drew for an admirer of his for "the simplest flying wing that can be built as an ultralight." Scott altered the design by not installing the under wing fins and shortening the udercart without raising the thrust line to give adequate ground clearance to the parking strut. This design is actually a STOL aircraft, using vortex lift at low speeds. Details of my designs were always freely available but I have yet to receive any recognition. Cheers, Lindsay Olen. Wooli, Australia")*

Wow, Andy, what a happy coincidence! I've spent hours trying to find that letter to TWITT in the archives, where he says essentially the same thing as in his guest book email to you just yesterday.

This could be a breakthrough, as the Winton family reportedly won't release info on Scott's Facet Opal design, ~20 years later. I agree with Lindsay Olen that Scott's plane needed more tailfin area, at least at low/slow speeds, as the video shows a pretty squirrelly, short-coupled, and twitchy plane. The landing gear is goofy, like a bar stool on roller skates. Better to have a Fauvel 36 type set of fins, with outrigger wheels in the bottom tips, and a bicycle landing gear sort of like Backstrom's powered Plank, but retractable. I emailed Al Backstrom yesterday about his *updated* thoughts on planks as mentioned in several old TWITT newsletters, but so far no response from him.

Anyhow, if Lindsay Olen could fill us in on some details, a properly tail-feathered version could be built, especially using techniques as discussed by Alex Strojnik for wing skins, the hotwire/foam trick for ribs, etc. A somewhat larger and more powerful engine in the rear would allow counter-balanced movement of the pilot further forward, for better cockpit visibility unobstructed by the leading edge of the wing. Putting the spinning prop further aft would also add longitudinal stability, or at least that's what I read somewhere--even if spinning, the prop blades act as tail feathers if/as aft of the CG, giving extra long stability. A more fuel-efficient engine might weigh more than the 40 hp thing Winton used, but then would use significantly less fuel, saving fuel weight and *overall* weight into the bargain. Since Winton planned a 3,000 *nautical* mile range for his plane, I suspect a more fuel-efficient engine may be even better, and more power would improve his remarkably good time-to-climb rates. Since the longest leg for round the world flying is Hawaii to California, one can imagine going anywhere in such a plane. Sorry, I'm getting ahead of myself. Anyhow, since planes are basically priced per pound, such plane might be a remarkable bang for the buck.

And, please tell Lindsay Olen that we'd love to give him all the credit he deserves, and then some, if he'd just share his ideas and history with us.

Another thing about the Facet Opal that you may already know: Go on YouTube and use keywords "Scotty Winton Opel" Note that's Op**e**l with an "**e**" and not an "a." Also, keywords "FLYING WING" perhaps in all caps will get you there. Nice little video showing goofy barstool taxi characteristics, maybe not so hot initial takeoff roll, but pretty sharp at speed. Flies like a barn swallow, which is saying a lot. Discussion of ~2,000 *nautical* mile range, otherwise elsewhere also noted at up to ~3,000 nautical miles. Time to climb records up to 30,000' on 40hp engine. Before you watch, re-read Lindsay Olen's comments about lower fins and undercart, and I'm sure you'll agree with him. In fact, what he wrote in his email the other day is exactly what others watching YouTube would have

thought--too short coupled landing gear and inadequate vertical fin at low speeds.

BTW, Olen is apparently a respected aerodynamics guy in OZ, and has done a windmill-powered catamaran that goes directly into the wind, with the windmill driving a propeller via hydraulic or mechanical linkage. Some folks say that can't be done but apparently he gets ~7 knots forward speed into a 3-4 knot headwind.
He'd be a great guest speaker at a TWITT gathering, the commute notwithstanding.

-Bart

(ed. – Overall this is more information on the Facet Opal than we have had in years. I haven't heard from Bart about any contact he had with Olen, but will follow-up to see what else we can learn.)

March 22, 2009

I love your wealth of information and pictures. Also, the technical discussions have been very enlightening. Used to fly hang gliders, ultralights and bootleg time as a copilot in various military aircraft. Now I am retired and flying RC gliders and electric planes.

I was searching for how to scratch build an R/C wing when I discovered your web site.

Malcolm Walworth
<malcolmw@dslextreme.com>

(ed. – This was another guest book entry and I am sure he will eventually find more information on building a flying wing from scratch. He later sent us the following e-mail:

I would be interested in coming to one of your meetings (if you still have them). Do you have one scheduled for the near future?

I just live up the road (Anaheim) and would like to meet you guys and get the links open to get more information on wings. I am into R/C electric and sail planes.

I love scratch building models and trying new designs. I really like your website and all of the information.

Below is another one that I had overlooked and thought should be included even if it was late.)

I have thoroughly enjoyed the passion of the membership and the general high degree of accurate knowledge. Time hasn't permitted making a contribution, but this has been an error on my part. I'd very much like TWITT to be among the first to gain detailed knowledge of my work when it becomes publicly known, and it's possible that some among the group might even be a catalyst to help complete it. Solo is no-go too much of the time!

John McGinnis
Kalispell, Montana
<mc2@cyberport.net>

March 16, 2009

Hi, Victor—

One of those expensive books that Andy Kecskes mentioned is "Tailless aircraft in Theory and Practice" By Karl Nickel and Michael Wohlfahrt. It was originally published in German as "Schwanzlose Flugzeuge". If you can read German you don't have to wait for the library, you can read most of it on Google books:
<http://books.google.com/books?id=33fBLs7FhQ8C&printsec=frontcover&dq=Tailless+Aircraft+in+Theory+and+Practice#PPA439,M1>

Other good books are "Tailless Tale" by Ferdinando Galé and of course "Nurflügel" by Reimar Horten and Peter Selinger.

For many years Bill and Bunny Kuhlman have written a column for *RC Soaring Digest called* "On the 'Wing...". All of those articles are available here:
<http://www.b2streamlines.com/OTW.html>

Also, if you haven't found it yet, the report of Mississippi State University's analysis of the Horten H-IV is here: <http://users.acsol.net/~nmasters/H-IV-report.html>

There are also some videos of full scale 'wings on YouTube.

An AV-36 that was completed last summer:
<http://www.youtube.com/watch?v=S5ra48VPLos>

The original promotional video for the SWIFT foot launched sailplane:
<http://www.youtube.com/watch?v=PoemvgDHg0k>

And just a few days ago videos of the Aachen and PUL-10 were posted by horten21st: <http://www.youtube.com/user/horten21st>

Of course there are many others in the "related videos" column

Norm Masters
<nmasters@acsol.net>

(ed. – My thanks to Norm for providing much more information than I could.)

March 19, 2009

I am sending you two video links about the restoration and flight of a Horten wing here in Argentina.

http://ar.wrs.yahoo.com/_ylt=A0oG73QNhsJJt4YAWm2r9Qt.;_ylu=X3oDMTByMTNuNTZzBHNlYwNzcgRwb3MDMgRjb2xvA2FjMgR2dGlkAw--/SIG=1209gu8bu/EXP=1237571469/**http%3a//www.youtube.com/watch%3fv=QXdTMswP19Y

http://ar.wrs.yahoo.com/_ylt=A0oG73QNhsJJt4YAU22r9Qt.;_ylu=X3oDMTBybnZlZnRlBHNlYwNzcgRwb3MDMQRjb2xvA2FjMgR2dGlkAw--/SIG=120jjdcbl/EXP=1237571469/**http%3a//www.youtube.com/watch%3fv=-iCh5E8qLkI

Best Regards

Manfred Block
<mbleitz@arnet.com.ar>

(ed. – I hope that these links will work from the electronic version of this issue. Don't forget that the user ID and password for access to the members only section are in the masthead. Using the electronic version would be much easier than trying to type in these long URLs. If you get a message from Yahoo, click on the "here" link and it will take you to the videos.)

March 29, 2009

(ed. – Even though this is not a link to a flying wing site, I think you will enjoy the immensity of what was accomplished. For those of you without an Internet link, it is a video of a turbo prop tow plane pulling 9 Blaniks into the air in Poland.)

One way to clear aero tow queues! Well worth watching.

http://www.youtube.com/watch?v=zAdIkB5rbgo

Doug Fronius

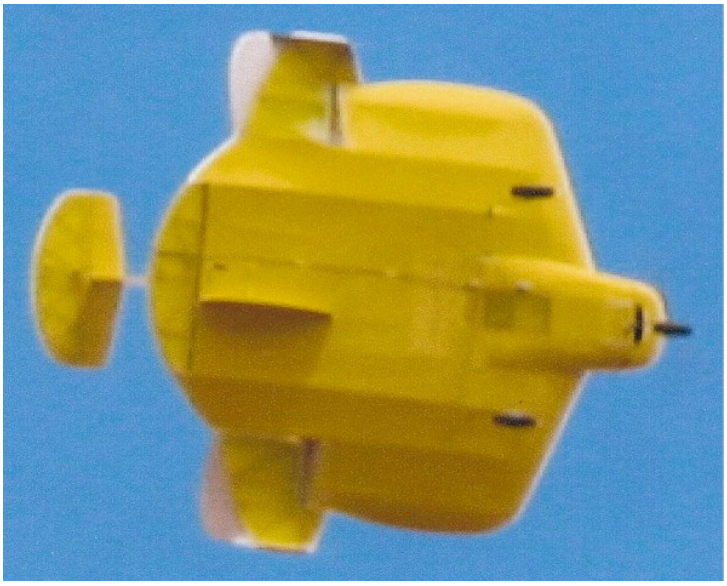
March 4, 2009

My address label indicates that my dues are due this month. I am sending you some info about my Low Aspect Ratio (LARA) project along with my check. If you dig out the March 2006 issue of TWITT it will give you some background for my descriptions of some of our experiments and where the project is now. If you look at the March 06 drawing you will see that roll and pitch is produced by almost full span elevons. Our charges down our test road showed much improvement in roll but proved crashingly that `up' elevons at takeoff and landing speeds produces lots of 'down' motion of the model.

After a bunch of testing and modifying, I decided that the ARUP and Vought Chance guys had been where I was and had come up with some successful solutions. So I stole the high placement of the elevator from The ARUP and the jutting ailerons from the (V-C) XF5U Skimmer. I moved the ailerons forward so I could fold the wings. The center section is 6 feet wide and the outer wings, including the jutting ailerons, are 5 feet wide. The outer wing panels will fold over the center section like the Dyke Delta.

Photos 1 (above) and 3 (top of next page) show the model's original configuration. I convinced some expert R/C pilots to fly it. They were amazed by how well this 'weird' airplane flew. It was quite maneu-

verable and also quite stable. If they held the controls stationary (banking position) the model would hold that attitude and altitude throughout the turn. In a typical power off stall condition it would simply drop its nose before any control surface stalled. With power on the model would go into a slow 'torque' roll that could be stopped quickly with aileron control before anything stalled. Landing gave my experts some difficulty because they were quite different than the usual thin winged model. The experts were used to gliding in low and fast. The LARA would glide into its ground effect level and sail along another 30-40 feet before settling gently onto the ground. We had a few PIO's before they followed my yelped directions.



The behaviors that bothered my experts were; a slight fishtailing and rolling in gusty conditions and a tendency to zoom when power and/or speed was increased. Photo 4 (above) shows the ventral fin that didn't work and photo 2 (top of right column) barely shows the flow dam between the cockpit and the rudder fin that did. The end plates didn't do anything we could measure but stiffening the aileron's fittings and increasing their areas (photos 4 and 5 [bottom of right column]) improved all aspects of roll effectiveness. More down thrust cured the zooming.

We spent our last flight testing the model's ability to recover from unusual attitudes. We put the model through loops, rolls, hammerhead stalls, inverted flight, etc. The model performed well. It was not as quick or precise as the classic aerobatic models but it was more than adequate. We were surprised that it flew well inverted with only a small elevator correction.

I realize that scale models are only indicators of how the full size airplane MIGHT behave and should be considered with reservations. The aerodynamic behavior of the model so closely mimics that of the full size aircraft I have researched that I am now constructing a 1/5 structural model out of 1/8" wooden dowels and scraps. This will give me some ideas about where and how the parts will go together. This model will be followed by a full size mockup of cheap steel tubing that should finalize the structure of flying prototype.

I want to thank you, Andy, for putting out the newsletter. I enjoy it very much and look forward to it each month. I also want to thank your small group of coconspirators who spend time and effort to answer and advise us TWITT enthusiasts.

Jim Loyd
Thornton, CO

(ed. – I want to thank Jim for his article and the pictures. I hope anyone with further ideas on this design will write TWITT so we can pass it along and share with the other "coconspirators".)

NURFLUGEL BULLETIN BOARD THREADS

For those R/C Nurflugel-flying wing pilots out there, this may be a normal landing for a Zagi-like R/C wing, but not necessarily a normal landing for the B-2 Spirit!

http://www.youtube.com/watch?v=t-W2Fr8mcpE

Take a look at the elevons...they're going nuts trying to compensate. This just goes to show what AFCS saturation due to insufficient/bad data can do to a digital FCS! In the V-22, if the air data lines for the FCC's have any blockage, you'll get a ADS FAIL advisory once you get any airflow in the system. I wonder if the flight indicent recorder for this B-2 registered something similar. It must have been pretty nasty to affect the entire system!

Brian Link
Senior Flight Test Control Engineer
V-22 Flight Test Team, Patuxent River, MD
Bell Helicopter Textron

(ed. – There are actually two videos from this link. After watching the first 1 minute 18 second video, click on the image that shows another 1 min 57 sec video and see some graphic reproductions of the crash, I assume taken from the actual flight data recorder.)

Telemetry

I am designing a new plane, an as my budget is very limited to make wind tunnel study, I am thinking into building a 1/2 scale RC model, it will have a wing span around 5 m.

In order to be able to get all the necessary data during the test flights (IAS, temperature, AOA, synchronized images, etc.) I am looking for real time telemetry equipment manufacturers, by now I have found this ones:

http://www.rcatsystems.com/telemetry/telemetry_exp.php
http://www.a2tech.eu/Products-Overview001.html
http://www.eagletreesystems.com/UAV/uav.html

Do you know any others?

Thanks

Miguel
<marpbcn@hotmail.com>

Miguel:

Do you require telemetry? Would recording the data onboard for later analysis be worth looking at?

At our place, we tend to go for the "Cadillac" version of whatever we¹re building. And we often forget that sometimes all you need is the "Chevrolet" version to do the job. Sorry, I don't know how to translate that into something others might grasp (maybe substitute "Ferrari" and "Fiat" or "Lexus" and "Scion").

But we often leap to telemetry with full control rooms and real time analysis. On the F-18 High Alpha Research Vehicle (HARV) we had about 5000 parameters (measurements) at sample rates up to 2200 samples per second. When we were flying that aircraft, it was the highest instrumentation bandwidth of any aircraft flying (and all telemetered, nothing was recorded onboard). Space Shuttle has since exceeded that bandwidth, and since then one other of our aircraft (F-18 Active Aeroelastic Wing X-53A). But in many cases, you can make do with onboard recording.

We've done a lot with onboard recording, mostly Onset Tattletales. But we've also had good luck with Cloudcap Piccolos. Especially on size or weight constrained aircraft (like small UAVs and RC airplanes). But we have also used them on F-18s and other high performance aircraft where we could not easily get power to a remote part of the aircraft easily.

That's not an endorsement of either product, but simply case history. And I'm not saying you shouldn't do telemetry, but if you don't need it, you might be able to get a cheaper, faster answer.

http://www.onsetcomp.com/
http://www.cloudcaptech.com/piccolo_system.shtm

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

Al,

As has been the case with other tech advancements like micro turbojets, the model airplane guys have been able to produce a near "Cadillac" telemetry systems for a tiny fraction of the "pro" systems.

Roughly $500 USD will buy an 11-channel telemetry system that includes the pressure transducers for pitot and static ports. The other channels can be used for anything the modeler likes. These systems will do real-time links and data recording. Video downlinks are old hat now. Google for vendors RCAT and Eagle Systems.

Bill Daniels
<BILDAN@COMCAST.NET>

In the late 50s at Miss. State, due to budget and simplicity, a lot of our flight data was gained from an 8mm camera focused on some fight instruments, manometers, etc. We used a lot of two place ex-WWII training gliders and often the rear cockpit had most of the data capture systems. A lot of surprisingly good data was gained.

Cheers,

Bob Storck
<bstorck@sprynet.com>

Hi Miguel!

Last year I made one TCP/IP based 8ch telemetry system, for the Budapest Technical University. (Currently, it's collecting the dust there.) It's an open source thing, so if you interested, I'll send you the schematic. But, I warn you, the system is in beta phase.

Happy flying!

Mark "Boreger" Balogh
<boreger@toons.hu>
HUNGARY

P.S.: Currently I'm working an small VHF video transmitter, combined with a GPS logger.(The GPS data will be sent through the audio channel.)

Thank you for all your ideas, in fact, my first idea was to install affordable altimeter and vario that you can buy for RC gliders and a video camera to register the movement of the threads put on the wings and others critical parts.

Step by step I was thinking how to obtain more and better data and so looking at eagle systems site, I thought that was a very good possibility but I really do not know if the system they offer is reliable enough.

Regards,

Miguel

Northrop Wing Slots

I was reading the rundown on the lecture Al Bowers gave on Flying Wing Design Issues. One section refers to the problem Northrop had with the slots.

Northrop was an airfoil aerodynamicist and what he did was use the middle surfaces for pitch and roll, and the outboard surfaces trimmed only in pitch and split to act as drag rudders. If the stick is pulled all the way back what you have done is induce mechanical washout in the middle section and wash-in at the tips. This is a good recipe for loosing the tip and having a stall/spin problem. One of the solutions was to try and put slots out towards the tips, which helped the stall problem but not that of spin. However, when the airflow over the slots separates it does so with a lot of hysteresis and a small decrease in angle of attack doesn't result in airflow reattachment. It takes a large change in the angle of attack to get the flow to reattach. This was a characteristic of the type of slots that he used.

I was wondering if I could get Al to comment on what type of slots Northrop used, why they didn't work right, and what would be the correct design to avoid the airflow problems.

Mike Thompson
<MikeT52@roadrunner.com>

Mike,

The slots were of the standard Handley-Page type. And the problem is endemic with all types of slots. They have large hysterisis and once separated, require dramatic decreases in AOA before the flow reattaches. This is not a problem in quasi-steady stalls, but cause large problems in dynamic situations.

Even if you could solve this, the elliptical span load

seems to cause a low damping in direction stability (Cn_r). I¹ve never seen a report on this (something an aspiring PhD could do a parametric study on, varying taper, sweep, and aspect ratio). Having flown many flying wing RC sailplanes, all of them with swept wings and elliptical span loads, and even those with winglets, all showed a lot of adverse yaw and low directional damping.

The only one I ever saw that didn¹t do this was Mike Allen¹s Klingberg-Horten. It was uncanny. Rock-solid directionally, solid longitudinal stability, and no adverse yaw, and no tendency to tip stall. We were all trying to get it to misbehave, slamming the stick back and forth, accelerated stalls, everything we could think of. Don Edberg (used to write the soaring column for RCM) tried as well. None of us could get it to misbehave. I noted in the short video clip from Diego in his Horten Ib, it looks just like Mike¹s Klingberg-Horten. The difference in span load makes these aircraft completely different in their behavior.

Al Bowers

Al, thank you for your response. Is this then, a condition caused initially by the increase in AOA needed to get separation?. And does chordwise location effect this problem.

Mike

Mike,

I don¹t know if chord location affects the size of the hysterisis due to separation. I do know that leading edge slots have it. In the case of Fowler flaps or other slotted flap systems, I don¹t know if it affects it as much. Good question. Let me rummage around a bit...

It is caused by the increased AOA. You can get the slot to hang on for a long time as you increase AOA. But once you stall, it takes a lot of AOA decrease to get them to reattach again.

Al

I ask about the chord location, because the Northrop wing appears to have the slots an equal x% of the cord back from the leading edge. Most of the ones I have seen are right on the leading edge.

Did Northrop use twist and slots?

I have found a good amount of reading on slotted flaps, but little on wing slots, and none that address these airflow problems at stall.
I'm wondering if this is a problem that can occur to any extent, during normal operation (by encountering wind shear etc.), or would the wing in question have to be aggravated, accelerated stall for example, to get the problem to appear. I just wanted to clarify that I'm thinking in the perspective of outer panel slots and not full span.

Mike

The maker of flying wing site announced his site to me. I never saw this site before, but ...man ... it has a lot of new stuff. Beside a pack of pictures of Flying wings it also has a BUNCH of 3-views of known and less known flying wings. I surely would propose to go see his nice work. Ok, I admit ... it is a bit of chaos (all info is on a single page) but ... who am I to blame somebody of chaos in his site.

www.niegratschka.de/nuri

Keep that brain creative,

Koen Van de Kerckhove"
<nestofdragons@hotmail.com>

That is a great collection of pictures. And the 3-Ds....did he do them himself?. I am impress!

I bet TWITT would like to include this link as it does augment that site on some planes. http://www.twitt.org/

Some of those birds are pretty rare.

Anybody know if one can still get all of the models in the Medelldauparadies add? Their web site does not seem to show most of these.

Warren Bean
<warren.bean@gmail.com>

German Circular Wing Design

I found these by accident:

http://www.flickr.com/photos/cutangus/64165280/in/set-963192/

http://www.flickr.com/photos/cutangus/64165279/in/set-963192/

http://www.flickr.com/photos/cutangus/78032768/in/set-963192/

(ed. – I tried to copy a couple of the pictures so you could get an idea, but they wouldn't convert to anything viewable. Essentially, they are WW II German concept drawings, one of which looks like the Vought flying Pancake with turbo-props.)

Three Thoughts

Starting from most important to least:

Wave in Southern California: for a week now we have had strong wave conditions in the Southern Sierra. The lenticulars have been spectacular to see everyday. I hope someone is taking advantage of the long daylight hours and good lift. The lennies are a little ratty today, but yesterday it was almost textbook perfect. I think of Kuettner's story of the 2000km flight when I see good wave like that.

Diesel and fuel: I have to agree with Bill, particularly in the short term. Diesel is the best solution. I don't know the exact numbers, but it would not surprise me if diesel was 50% less CO2 than gasoline into the atmosphere. Long term I think we've got to move to H2 though.

And least important: I move to Washington DC this weekend. I start Monday as a special advisor to the NASA Associate Administrator for Aeronautics (that sounds LOT more important than it is, I am still a nobody). This e-mail will still work if you need to get a hold of me.

Al Bowers

Al,

Thanks for the comment on diesels. As for H2, I don't see how enough of it can be stored in an aircraft and still have economically useful interior space and range. We need some new physics.

As for the Sierra wave, Jim Payne made a 1700 Km flight in his ASW-27 yesterday. See: http://www3.onlinecontest.org/olc-2.0/gliding/flightinfo.html?flightId=-291648315

No bad for no fuel at all. (Except, of course, for the tow.)

Bill Daniels

At altitude, H2 fuelled aircraft create as much of a greenhouse effect as efficient kerosene engines but at lower altitudes not so much. There is a real possibility of hybrid planes that use H2 or bio fuel cells for climb but batteries for cruise. Batteries alone will likely always have limited range because of the weight.

Interesting times,

Rick.

And the hydrogen that was consumed by the sun to drive the convection.

Norm Masters

Bill:

As for H2, I think we will have to rethink what aircraft look like. We¹re going to have to get used to high-pressure systems or cryo to get enough density of H2. And flying lower isn't such a bad thing. We'll have to get used to flying slower. But if we can reduce the inefficiencies at airports, that might be okay. For me to get to Washington DC and back, door-to-door, I average about 240 knots. Flying fast isn't what is keeping us slow right now. Maybe aircraft will still have tails (ugh!), but they will be blended-wing bodies (note all lower-case) to get the fuel volume AND keep the drag down. Maybe this will kill the classical "tube-with-wings" at long last!

Al

Nurflugel 2.26 Tutorial

Peter Wick, the designer of the "PW" series of airfoil sections, is doing a tutorial of the nurflugel flying wing design program at <http://rcsoaringcommunities.co.nz/viewtopic.php?f=22&t=152&sid=516271ae4c7b2b9c307243399eac822c>. This includes English translations of many German words in the menus.

This should really help to make this program more accessible to non-German speaking people since Babelfish doesn't do a good job with technical German.

The program can be downloaded free here: <http://www.zanonia.de/ranis.php>

Norm Masters

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.

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VIDEOS AND AUDIO TAPES

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

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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.
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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
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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
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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".
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Add: $2.00 for foreign postage

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