

T.W.I.T.T. NEWSLETTER



A Bernie Gross flying wing model. See page 7 for more pictures and story behind this wing.

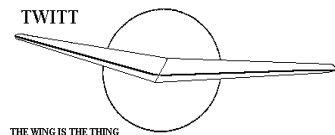
T.W.I.T.T.

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., **1212** means this is your last issue unless renewed.

Next TWITT meeting: Saturday, January 19, 2012, 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.

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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

T here were some interesting e-mails this month so I hope you enjoy both the good and bad that is reflected in them. I try to be open minded and accept criticism of what is in the newsletter each month since I think having an open discussion helps make improvements.

The cover photo came in from an unlikely source and I think it is great that Bernie's model design has endured all these years. One of the photos show it in flight so it is not just a display piece for the owner.

I hope some of you will provide answers to the questions that are being asked in a couple of the messages. This is the way we all learn more about the design, building and flying tailless aircraft, which is one of the tenets of TWITT.

I keep forgetting it is the holiday season and that I should be throwing in some festive pictures of Santa Clause, snowmen and holly, but it is late in the evening and I need to get this off to the printers so it can be delivered on time.

I will be interested in seeing the response to my offer to start doing more electronic deliveries of the newsletter. This hasn't been a popular option in the past, but with more people getting on-line perhaps the response will be different this time around. Don't forget you can see everything in color plus you can zoom the PDF file out to make it easier to read. I do this with many documents so I be more comfortable when doing a lot of reading.

HAPPY HOLIDAYS AND HAPPY NEW YEARS.

Andy



LETTERS TO THE EDITOR

Andy:

I have yet to understand the number in the box system but this time it is purple over colored and 4 years ago I felt that I'd better send a lot of bucks or you'd turn me off before I figured out how it works. I still can't solve it but I enclose \$20 for another year and hope in that time you will run an explanation. If not, then I guess I'll just let it lapse because most of the rest I can't understand either.

Just an example is issue #317 (November 2012) with the beautiful bird and the fine start on model wing sections. Then pages 5 and 6 (wing sections) can't be read because it a total typo-blurred illegible with no info where there might have been a good article.

TWITT has gone from a good publication to life's greatest disappointment and I only that in 2013 it will revive. But then, living alone the frustration of TWITT is simply par for the course.

I do not feel that the fault can be imputed to the Hunsaker Foundation but that may contribute to the mess, but TWITT sure is a mess.

Sincerely,

Syd M Hall
Nevada City, CA

(ed. – Syd's letter just came in the other day and he doesn't have e-mail so this is the quickest way to answer his question on the label and hopefully address some of his concerns on the quality of material in the newsletter.

*Let's start with the label. The number represents the year and month your subscription will expire. The cover of this issue shows **1212** so you expire in December of 2012. As you approach your renewal month I start bolding the number and then highlight it so you are more aware of the pending month. As a courtesy, I usually send you 2-months beyond that just in case you missed it and in many cases that does the trick and you renew, for which we are grateful.*

As to Syd's comment on the quality of the last issue the most I can say is that I had sort of hedged my bet with the wing section article by saying it was generally readable but thought it worth including for our modeling members. I will continue to include the

second part in this issue because I said I would and I am short of other material to fill the space.

I am sure Syd may have also been commenting on the lack of substance in some issues. This is a factor of what is available at the time I go to press and I would love to include more articles on projects, designing, etc., but they don't come to me in the mail and I can't create them since I am not an engineer or aerodynamicist. I extract the best of what is in the various subscription services I am registered with and try to find pictures that might help with the discussion, but this is not the best solution.

I am not sure what 2013 will bring for an improvement in the quality of the content of the newsletters. It will depend on what the members send in and Syd has been a past contributor with his ideas and drawings.

We are no longer affiliated with the Hunsaker Foundation since it closed its doors many years ago. I updated the website years ago, but now that Syd has mentioned it I see the information is still in the masthead of the newsletter, which have removed as of this issue.

I hope this in some way answers many of Syd's questions and only time will tell whether I can raise the overall quality to what it was when TWITT was a much more active group. My thanks to Syd for his honesty.)

TWITT Members:

I have developed a model airplane of my own design. It flew in the low speed tunnel at SDSU (San Diego State University) and performed well enough to warrant an investigation into the flight characteristics. I then built a 36 " wingspan RC flight model and it is showing good promise. It is a flying wing using the Finchtip and is a further development of that wingtip concept.

A laser scan of the model has been performed but a Cad/Cam program has not been created yet. I may be looking for partners to build a full-scale prototype in the near future. Carbon fiber and other advanced materials will be used.

I may patent this design when it is finalized in which case it must not already be available for public view. Also the cosmetics have not been done yet and changes are being made daily. I shall supply pictures in the near future. If you have any interest please contact me on: 619-435-1075.

Reg Finch

(ed. – Reg is a prior member of TWITT and has been playing with various designs, including his Finchtip. He is obviously looking for both physical and financial assistance with this project that is located in San Diego, CA.)

Hi there, Will here.

Just another older gentleman with a life-long desire to fly my own homebuilt. I first became interested in low aspect ratio airplanes with the Horton, wing in ground effect aircraft, and the like. I would love to build a "Facetmobile" but so far the Wainfans and Mr. Dean have not offered a kit nor plans, only a paper folding model!

I came across your TWITT website today and while browsing I read the article on Bird Oriented Design Concepts by Syd Hall and actual bird-shaped flying models by Bob Hoey, both pretty interesting articles. I suspect Syd has passed on by now as the article appears to have been written before the last update of 2002 and I think he was 82 at the time. He's probably a happy clam soaring with the angles by now! :-)

It's a shame that for most of us, the latter years of our lives is the only time we have the extra time to devote to things we have formally put off most of our lives due to life's demands. For some of us it is a time of great creativity then the clock runs out!

Has someone else taken up the design torch on Syd's concept? I don't have any desire to so but it just begs a sequel! There might be much to learn in doing so.

Take care,

Will Dysinger

(ed. – I responded with, "Thank you for the note and information about your interests. Syd Hall is still an active member however I do not have an e-mail address for him. I will put your note in the next TWITT newsletter in December and see if it gets a response by regular mail from Syd. If you would like him to write directly to you, you could also provide me with your address and I will include it with a comment to Syd about writing to you and TWITT."

Will responded back with, "Well that's great Andy, thanks for responding. I'm glad he is still active and kickin! It would be great if he posted some pics on

TWITT of his project (as it currently stands) for the benefit of all and perhaps a little text update? Email is fine by me for contact although if he prefers snail mail I will include that as well. You have my permission to forward my contact info to him.")

William Dysinger
tinkerbill@gmail.com
 32235 SE Pipeline Rd.
 Gresham, Oregon 97080
 503-449-8517 cell

(ed. – The following was a communication between our member Stefanie Brochocki and Tony Burton related to an article on the BKB-1. I have a PDF copy of the article that he sent her so if you are interested in a copy please drop me an e-mail and I will send it out to you.)

I understand that you are the current editor of *Free Flight*. Some years ago I tried to obtain a copy of an article in the February 1956 (to my knowledge) issue. The article concerned the BKB-1, a new tailless glider design by my father, the late Stefan K Brochocki, and constructed by him and two colleagues, Fred Bodek and Witold (Kasprzyk) Kasper. At the time of my request, I believe your archives were going through some re-organization and the request could not immediately be granted. I never heard anything further. I let the request go to the back burner as I took a break from research into my father's design work. Is it now possible to get a copy of this article? It seems rather elusive.

I belong to a flying wing organization based out of San Diego. It seems there is a considerable amount of interest in this glider worldwide, and I am trying to provide information on its testing and development. This article would be useful. Originally your article sparked a great deal of interest worldwide in the BKB-1 judging by the correspondence received by my father and now held in his personal archive. I would be grateful for your assistance in obtaining a copy. Thank you.

Best regards,

Stefanie Brochocki

Good day Stephanie

My apologies for the delay in answering – your e-mail sort of got buried in the pile.

I searched through the 1950s issues of Free Flight and found it in the Feb 1956 issue. I scanned and cleaned up the article and it is attached. There was also a reference to it in the 1-1972 issue.

Dear Mr. Burton,

Thank you so much for the BKB-1 articles. It's very generous of you to take the time to fulfill my request. I'll keep in touch as there is a great story in all of this.

Stefanie Brochocki

Hi Andy,

I am not sure if I sent you this article earlier this year when I received it. I had been trying to get hold of it for years but I don't think Free Flight had all their archives in proper order until recently so I tried again and got lucky. I thought I had forwarded it but apparently my brother never received it from me so it's possible you didn't either. The article generated a fair amount of correspondence to my dad. I have some of it on file.

Steff

Hi Andy,

Just wonder if you and/or someone in the group might be able to fill me in on a flying wing glider question.

I vaguely remember reading that at the end of WWII the US Army sent a group called Technical Air Intelligence around to collect any interesting advanced enemy aircraft and/or technical data associated with same.

In addition to the Me-262 and other more well known German projects, Technical Air Intelligence was said to have picked up 40 flying wing gliders and a fair amount of technical data.

I'd just like to know whether there is any truth to this, and if so, what became of the flying wing gliders, destroyed, given to the Area 51 Soaring Society, or still locked away in a huge warehouse like the one

seen at the end of Indiana Jones and the Raiders Of The Lost Ark?

David Bogart
305 Walnut Street
El Campo, Texas 77437-2953
979-541-5596
<dave.bogart@yahoo.com>

(ed. – I responded with: "I have forwarded your question on to someone who might have the answer. You may hear from him directly, but if he responds just back to me I will forward it on to you along with publishing the whole discussion in the December issue to share with our members.")

-----0-----

The last couple of TWITT Newsletters have arrived with torn pages. #315 and #316 are not so bad, but #317 is unreadable. It looks like it has been torn up in a sorting machine. Any plans to offer the newsletter online? It would certainly be cheaper and a lot less labor.

Chuck Clemans

(ed. – I responded with: "Sorry to take so long in getting back to you but I have been on vacation and away from my computer for several days.

I know that others have had periodic problems with the post office damaging or destroying the newsletters when going through the sorters. Some post office regions are worse than others. In order to put them in mailing envelopes I would have to raise the dues because the weight and postage go up so have elected not to offer that service since I receive so few notes on this problem.

As for them being available on-line, they are all on the website under the members only section. You can always find the user ID and PW on the masthead section of the newsletter but for quicker access the ID is 20issues10 and the PW is twittmbr.

If you would like I can add you to my small list of members that have elected to receive it electronically. I send them a message with the issue attached so you don't have to go to the website unless you want to research something in a prior issue. I will remind you coming up on the expiration date since you won't be seeing a mailing label any more. Let me know what you decide after looking at the electronic versions."

Chuck came back with, "I would like to switch to the electronic version of the newsletter."

I have offered this service in the past and it has usually fallen flat with an overwhelming number of you wanting the hard copy. Of course you always have the ability to view each issue in full color by going to the members only part of the website.

If any other members would like to switch to the electronic delivery method I will be glad to add you to the mailing list and adjust your expiration date based on a \$10 level membership. Your renewal in the future would then be \$10, which means I will have to create another item for the PayPal button.)

Hello,

I noticed that you website has an error regarding the Cascade Ultralights, Kasperwing 180.

Your site has the Kasperwing Ultralight as a **1-80**, the correct number is **180** and is in reference to the wing area which is 180 sq feet. The Kasperwing Ultralight was produced in several models A, B, C, CR, D, all with the same **180** designation.

Thanks,

Jack Olson

(ed. – See one of the original promotion flyers above right.)

Hi Bob! (Hoey) My name is Marqs, 63y. I'm from Brazil, very good job on your birds. I am interested in building the vulture. I saw on the Net, plans about constructions, but I would like to know if the plans are your original plan, or you sell your own. Best wishes.

Marqs

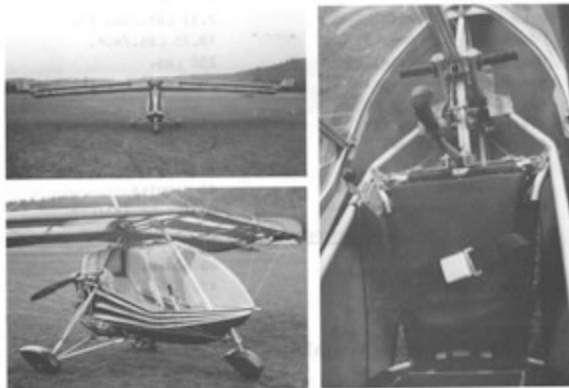
Hi Marqs,

A construction article for the Turkey Vulture was published in the June 2000 issue of Model Airplane News. I believe plans are still available from;

— NEW FOR 1984 —

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Will provide you with "Fighter Plane" — like performance at a price that won't destroy your budget.



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Please refer to <http://kasperwing.com/>

Air Age Mail Order
P.O. Box 407
Mt. Morris, Illinois 61054-0407
USA

Ask for Plan Number FSP 0602 (\$19.95)

The plans show a wing dihedral of 16 degrees, (8 per each side). I have since reduced the dihedral to 10 degrees (5 per side) and the model is easier to fly. (Less roll oscillations.)

Good luck on your vulture. I'd be happy to answer any questions you have about the model, since some of the photos were not included in the original magazine article.

If the plans are not available from Air Age, send me your regular-mail address, and I will try to mail you a copy.

Bob Hoey

To whom it may concern,

Is the TWITT organization still in existence? I only ask as most articles on the website appear to be a few years old, I am hoping to get in touch with your members to ask some aerodynamic questions relating to an R/C flying wing design I am currently test flying.

Many thanks,

John Newton (flying wing enthusiast)
www.myskies.co.uk

(ed. – I responded with: “Thank you for the inquiry. Yes, TWITT is still in existence as an association and the monthly newsletter is still being published. I have not been very diligent in adding new material to the website partly due to time constraints and partly in there being no really outstanding items coming my way that I thought warranted that type of exposure. We no longer hold “official” meetings with speakers so that source of material dried up and search engines enable folks to find almost anything else related to flying wings on the Internet.

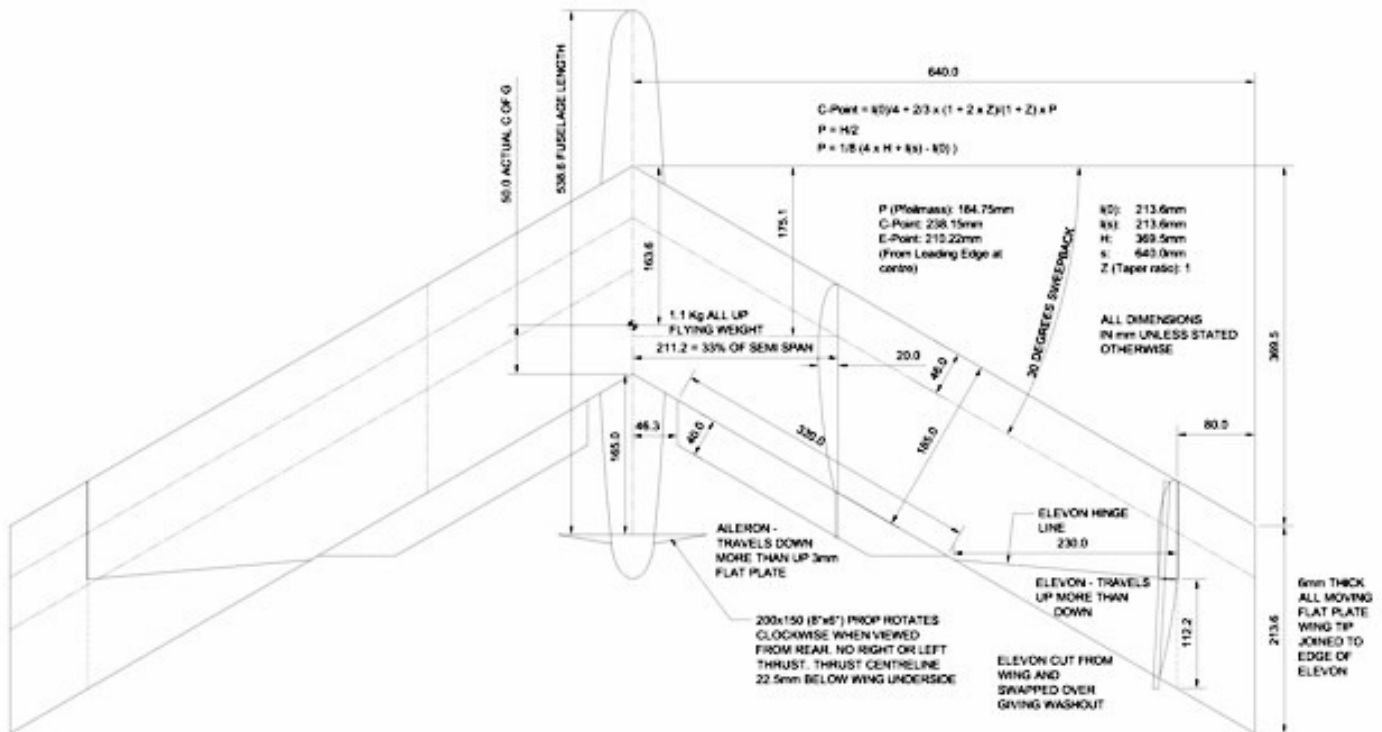
If you would like me to pass along your questions to our members, please send it and any pictures you would like to share to me in the next couple of weeks



and I will get in into the December issue. He sent back the following.)

Dear TWITT members,

I am currently developing a tailless (without fins) radio controlled model aircraft. The aim is to create a model that is simple to build and has good stability and control characteristics. I am prepared to sacrifice optimum performance to meet the above goals. Attached is a photo and diagram of the model in its current state. To simplify construction the wing is built flat with only the elevons being raised to offset any negative pitching moments.



Note that the outboard elevons move up more than down and the inboard ailerons down more than up in an attempt to counteract adverse yaw whilst not affecting pitch, adverse yaw appears to have been reduced compared to earlier flights without this measure and pitch is not affected when rolling.

The model features small removable fins (approx. 40mm high) which are located just inboard of the wingtips (80mm inboard). With the fins fitted the model behaves well and flies like a conventional aircraft, it has a good turn of speed and the stall is sedate. With the fins removed the model is stable but is extremely reluctant to turn once throttle is applied to maintain/gain height, in gliding flight it appears to turn satisfactorily.

I would be interested to know if TWITT members have any ideas why it is so reluctant to turn (is it adverse yaw, or possibly due to large a dihedral effect from the large sweep?) and any possible cures for this (would shifting the C of G forward help for instance?). Another thought is that the prop is causing too much weathercock (directional) stability due to it being aft of the Centre of Gravity but I am not sure of this.

I have calculated the Horten C-point for the model (centre of lift for constant local lift co-efficient) and the E-point (centre of lift for elliptical lift distribution). As you can see the current Centre of Gravity (163mm) is well ahead of these two values (for reference the Horten brothers typically used a C of G 20% of the Pfiel mass ahead of the E-point giving a location of 173mm for my model). I understand that the further forward the C of G the less the adverse yaw but the worse the performance/efficiency.

One development I am currently considering is the use of spoilers to control roll as these would provide roll with proverse yaw and potentially allow me to move the Centre of Gravity back toward the E-point (the optimum?) whilst still removing the unwanted drag due to having fins during straight and level flight (when they are not needed).

I am also interested to know if anyone can tell me what the lift distribution of my model currently looks like and where the neutral point is located.

Videos of the model in flight can be viewed at my website www.myskies.co.uk if you have any questions and for further information just e-mail me at jhndesign@hotmail.com

On a related subject I notice in Karl Nickel and Michael Wolfahrts book Tailless Aircraft in theory and practice (p.442) they advise against using a Bell shaped lift distribution (as per Horten/Prandtl) because it gives the induced drag is 4/3 that of the optimum elliptical distribution, however, I have seen it stated recently that the Prandtl/Horten BSLD gives a 22% increase in span and yet a 11% reduction in induced drag, what am I missing?

Any comments and input on the above would be greatly appreciated, thank you for your time.

John Newton
www.myskies.co.uk

Good morning:

I have in my possession a flying wing. I do not know that the name and the designer. I have attached photos with hopes you can help.

Sincerely,

Aldo Luparelli

(ed. – I wrote back with: I think this is what you are looking for <http://www.twitt.org/gross.htm>. The design was originally done by Bernie (Bernard) Gross who also built the Deaf Hawk Pioneer II flying wing glider. Bernie was hearing and speech impaired but it didn't stop him for pursuing his flying dreams. See the next page for pictures.

Here are some other links I found tonight. The Google search was: [bernie gross flying wing models.](#)

<http://aeromodelismovolarlibremente.blogspot.com/2012/04/flying-wing-de-bernard-gross-1942.html>

http://www.outerzone.co.uk/plan_details.asp?ID=2840

<http://www.rcgroups.com/forums/showthread.php?t=938072>

<http://www.thebuildingboard.com/2011/03/bernie-gross-flying-wing.html>

<http://www.co-op-plans.com/magento/index.php/catalogsearch/result/index/?dir=asc&limit=25&mode=list&order=price&q=flying+minutes>

<http://www.ebay.com/itm/VINTAGE-1948-GROSSWING-Bernard-Gross-95-WS-Flying-Wing-Plans-Part-Templates-/190689116283>



All:

Fascinating true story; you'll be on the edge of your seat.

http://www.youtube.com/watch?v=40knj0gg_Us&feature=related

Also, here's a free photo to accompany the U-Tube link to the Vulcan mission link in your newsletter, if you have room:

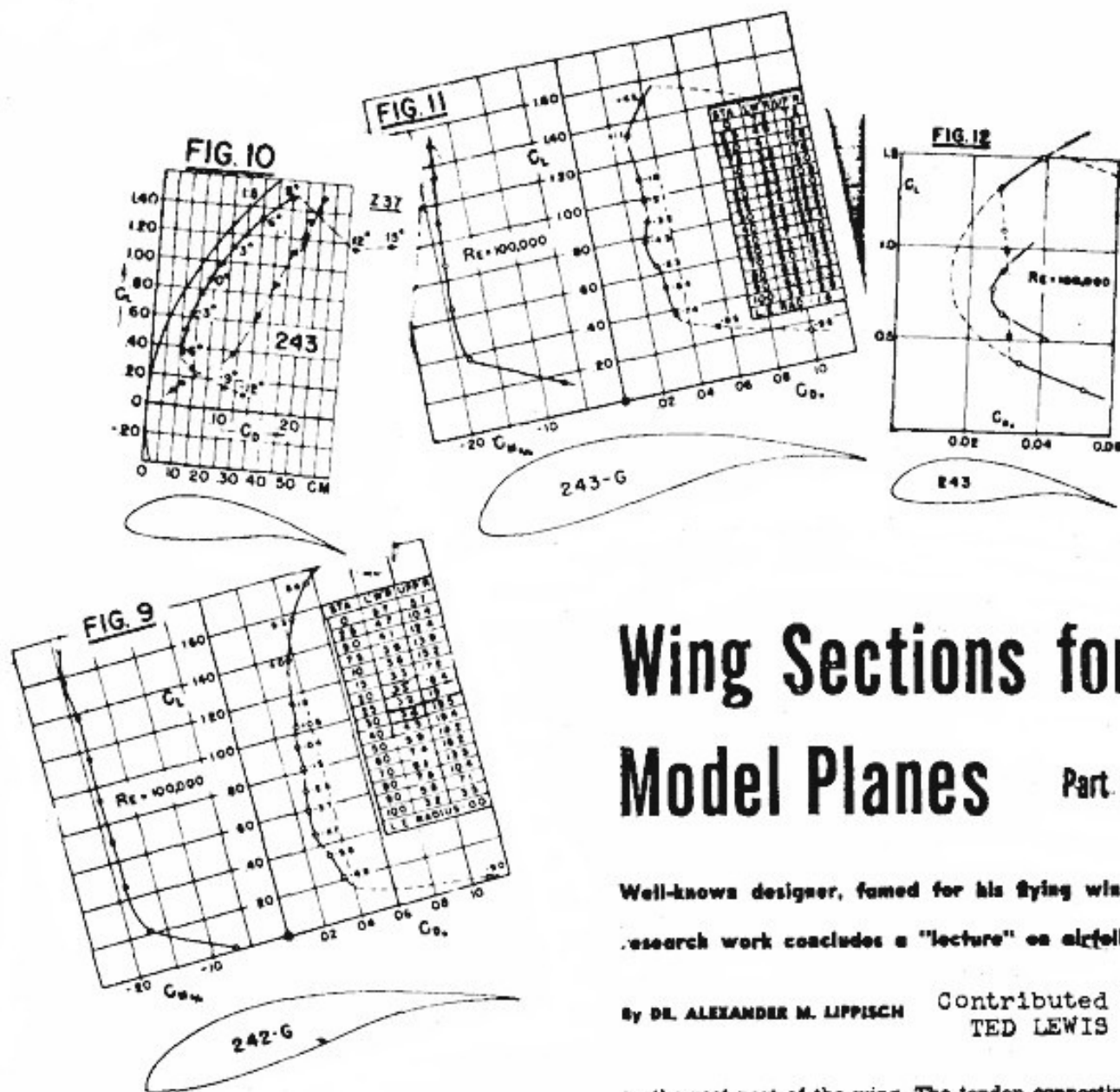
http://upload.wikimedia.org/wikipedia/commons/thumb/7/77/XH558_Planform.JPG/220px-XH558_Planform.JPG



Phil Barnes
pelicanag@aol.com

(ed. – I used the last two pages that needed filling to post almost all of the Lippisch article on model wings. There were three pages and only room for two so you will have to wait until January to get the last tidbits.

I know it can be hard for some to read, but it is the best resolution I am sure Serge to achieve in trying to restore it. I was just glad I could include something of value instead of trying to find blurbs from the bulletin boards.)



Wing Sections for Model Planes

Part 2

Well-known designer, famed for his flying wing research work concludes a "lecture" on airfoils

By DR. ALEXANDER M. LIPPISCH Contributed by TED LEWIS

Cont'd from page 6

Editor's Note: In the April issue Dr. Lippisch introduced the subject of scale effect on models and its importance in the selection of airfoil, aspect ratio and wing efficiency. He confirmed many suspicions that the so-called laminar flow airfoils do not act as laminar flow sections when reduced in scale; now he goes on to show that some full-scale non-laminar flow airfoils may assume laminar flow characteristics when scaled down.

LET us now have a look on the next section, 242, which is somewhat thicker (Fig. 9). It is interesting to see that the sharp pointed nose does not have any bad effect on the maximum lift. On the contrary, this section has the highest c_{Lmax} . It is remarkable that the larger birds have such pointed nose sections

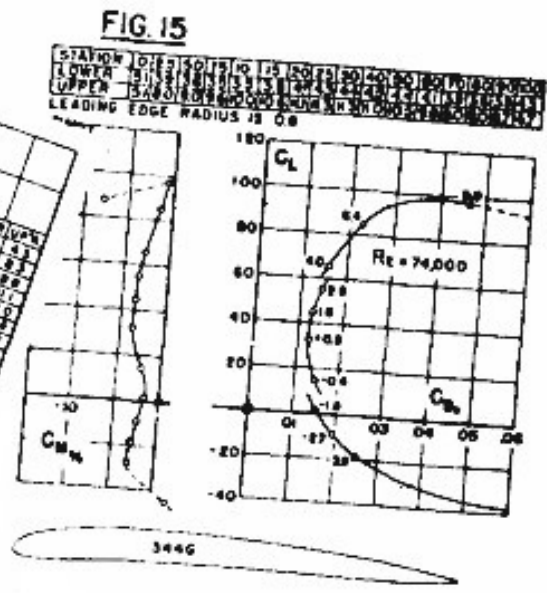
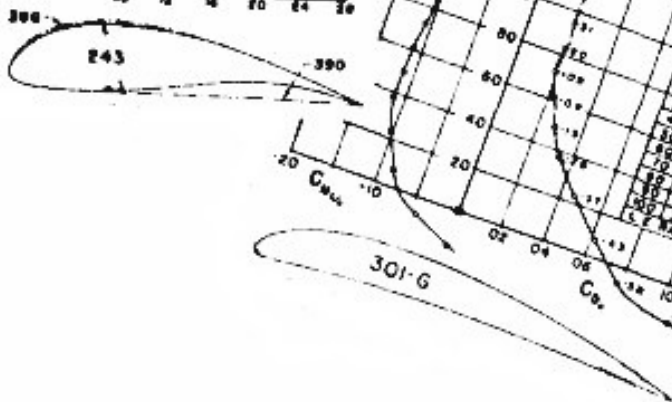
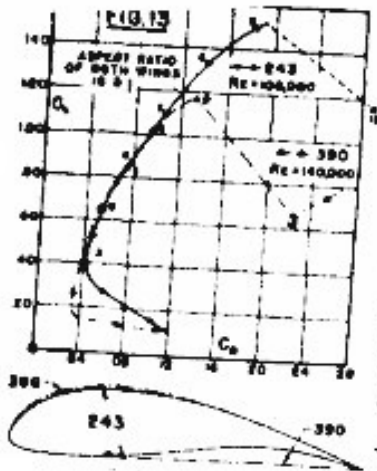
on the root part of the wing. The tendon connecting the shoulder with the wing forms this pointed nose part of the inner wing. The drag shift is not so pronounced with this section because the "undercamber" is not extended enough toward the leading edge. The drag minimum is somewhat larger than for 227 (see Part I), but the absolute L/D_{max} is about the same.

A real thick section of the bird type is section 243, which I will show you next.

Fig 10 illustrates the original measurement. You see that again we have a sudden stalling at the 9° point but at least at a considerably higher c_{Lmax} of 1.50. Therefore, this is not very serious and could be smoothed out if we made the nose a bit sharper. The thickness ratio of this section is close to 20 percent, which means that you really can design some aspect ratio with it.

The absolute characteristics of section 243 are represented by Fig. 11. Here you see again the distinct branches of the absolute polar. The inner laminar

Here's How



cont'd from page 33

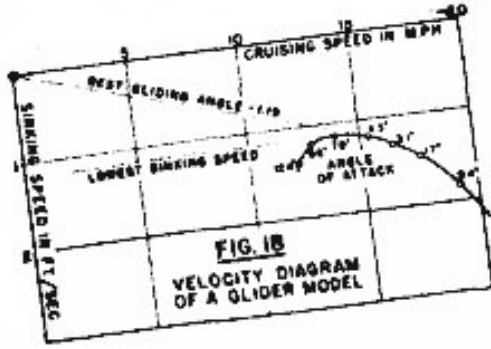
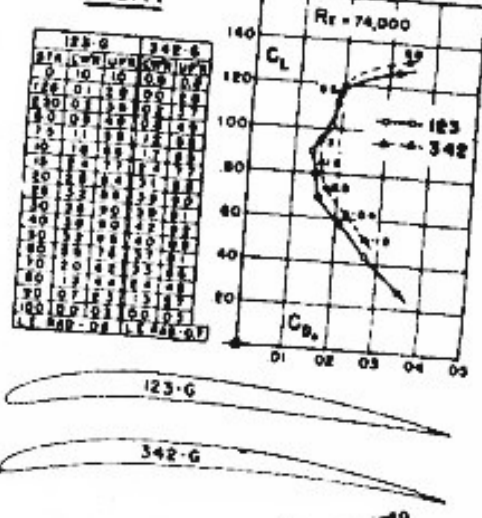
bump is well pronounced and shows a $c_{p_{min}}$ not far from section 227. The absolute L/D is higher than that of the two other sections because we have here a pronounced decrease of drag on the lower surface.

How the different branches of the polar can be distinguished is more clearly shown on Fig. 12. We see the inner laminar part and then the transition to the outer branches which could be connected by an ideal dotted line. You might say that the points measured are not sufficient to warrant this suggestion, but more detailed recent tests on other sections show the characteristic shape of the different curves. While the flow conditions on the boundary layer are very sensitive against little changes, we can expect to get the outer branches more extended if we produce a very clean design. The maximum L/D , which is here about 50 proves that with some higher aspect ratio we can get a gliding angle above 1 : 20 with some larger model.

I thought it would be of special interest to compare this thick-cambered section with a section of about the same thickness though without the undercamber. Fig. 13 illustrates the two sections 243 and 390 together with the polars for $AR = 5$ (AR , of course, meaning aspect ratio). The values of section 390 were taken from a later test in the larger wind tunnel and at a somewhat higher RN (Reynolds Number). The effect of the undercamber can be seen very clearly. The break-away of the flow happens at about the same angles of attack but the cambered section has at that incidence a considerably higher lift coefficient. The camber at the lower surface shifts the curve up into a higher c_L region, which is most favorable for gliding and sinking speed at high AR . I think that this figure just speaks for itself.

Now you may think that I Turn to page 35

FIG. 17



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.

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

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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
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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
 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
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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

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