

T.W.I.T.T. NEWSLETTER

The Northrop Grumman Unmanned Combat Air Vehicle (UCAV) as an artist sees the concept at this point in its development.

Source: Northrop-Grumman website

(See page 7 for a little more information on this newest fling wing aircraft from the Northrop designers.)



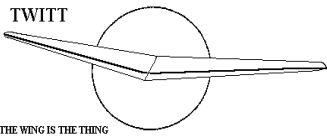
T.W.I.T.T.

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., 9807 means this is your last issue unless renewed.

Next TWITT meeting: Saturday, July 18, 1998, 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, east side of Gillespie).

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PRESIDENT'S CORNER

First of all, I would like to thank R.W. Long for his contributions of pieces from his Kasper wing, the many photos of the construction process and, an article about his experiences. The photos and article will be used in the September newsletter, since the September program will be focused entirely on Kasper wings. We have a speaker lined up along with some other Kasper hardware, so it will all fit together perfectly.

Make sure to look over the announcement about the SHA Western Workshop coming up over Labor Day weekend at Tehachapi. The program looks real good, with Richard Avalon bringing in a Mitchell B-10 and Al Bowers giving a presentation on the Horten 15m foot launched sailplane. If you can't come for both days, at least try to make it for Sunday's program.

We have added another publication ad for Bruce Carmichael. In preparing for his July 1998 NSM Symposium presentation he found he had enough material to put together a small, soft bound booklet on Ultralight & Light Self Launching Sailplanes. It looks like a good addition to the homebuilder's library. Depending on schedules, it's possible that Bruce may be able to give his presentation at the November meeting, which includes several types of flying wing aircraft. This would also give those of you who couldn't make the Labor Day workshop banquet a chance to learn more about ultralights and light sailplanes.

I'm really looking forward to the next several meetings. The programs for July and September should be very special and enjoyable for everyone. The subjects are tailored for all you flying wing buffs and I hope that any vacations will include a little time for attendance at the TWITT meeting.

**JULY 18, 1998
PROGRAM**



We hope you marked your calendar last month so you wouldn't miss this meeting. Our guest speaker will be Taras

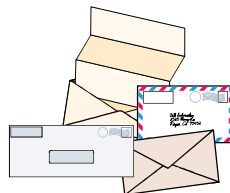
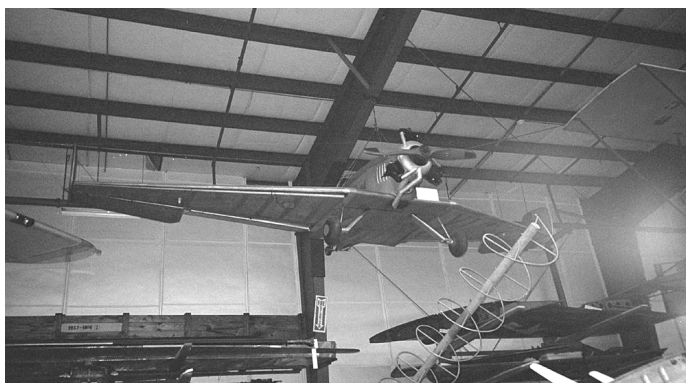
Kiceniuk, Jr., a name well recognized in the world of hang gliders and man powered flight. He will bring along a series of slides and video covering a historical perspective of such diverse subjects as articulated model flying wings, rigid flying wing hang gliders like the Icarus series, and human powered aircraft like the Gossamer Albatross. Taras was personally involved with most of the aircraft he will be discussing, so he could be considered an expert on the subjects. This should be an informative, as well as somewhat informal, program so bring along your questions.

Taras got involved in flying at a very young age, flying gliders in the US and, of all places, India. Winch tows were the primary method of launches in India, and he racked up his share over a two year period. He and his father flew gliders out of the Mojave desert for a number of years and, they built and flew an Olympia. Taras got into building and flying hang gliders. He was one of the first, if not the first, to actually have a hang glider soaring flight off the cliffs of famous Torrey Pines, achieving times of 70 minutes to 2½ hours.

Taras was heavily involved with Paul MacCready in developing, building and flight testing the Gossamer Albatross that eventually won the human powered award for flight around a closed course. He eventually went on to earn his bachelors degree in engineering from the California Institute of Technology. In an unusual career twist, at one he time worked with live dolphins conducting various types of experiments.

This is shaping up to be a very good program. Taras indicated he would also be trying to talk his equally famous father into accompanying him to the meeting. Talk about a double treat!! So get that calendar marked and the car or airplane full of gas so you don't miss this program.

THIS WILL ALSO BE OUR ANNUAL ANNIVERSARY PARTY WITH CAKE AND ICE CREAM. SO COME AND JOIN IN THE CELEBRATION OF TWITT'S 12 YEARS OF SERVING THE FLYING WING COMMUNITY.



**LETTERS TO THE
EDITOR**

6/3/98

TWITT:

My wife and I have just returned from a trip to Germany where we spent a week with Bernhard Mattlener and Siegfried Panek. The Mattlener and Panek families helped me to learn a little more German, especially such important things as how to name foods that I hate. They are ground testing the 90 hp BMW engine which has four valves per cylinder, fuel injection, electronic ignition and much better efficiency than Continental or Lycoming. However, customers will be able to choose other engines even though we think the BMW will be best.

After we perfect the tandem seat PUL-10 we would like to manufacture the kit in the United States. However, this cannot be done by just two or three people. It will take a team of people who can work on a team without trying to take over the whole thing. The difficulty has been that too many people want to redesign the PUL-10 so that their name will be in history with the Horten brothers. They take the finest equations and aerodynamic software and in theory they might appear to improve it. They almost demand, "Dr. Horten was to prejudiced against laminar air flow, but everybody is using laminar airflow today and you should change your airfoil and do it too". Or, "The best geodesic application of differential equations mathematically proves that an elliptical lift distribution is better than that bell curve lift distribution you use. Why don't you change your wing twist accordingly". Or, "You really ought to use solid cored foam wings like the Long-EZ". Almost all of these things have been tried and still, the theoretically imperfect PUL-10 works best. The fact is that, as my quantum mechanics professor always liked to show us, the laboratory test is the final judge and jury before which the most elegant mathematical conceptions can unravel.

BELOW, LEFT: At some point I lost the title to this picture, but it appears to be a Lippisch design, possibly the DFS 39. I think the picture came from the Nurflügel website page, but I haven't been able to get into it again to confirm the information. But, it does make for a nice fill piece.

Siegfried Panek spent 18 years flight testing airplane models, getting better information than the most expensive wind tunnel tests could provide and he has tested all sorts of so-called improvements, only a very few of which worked. And Dr. Horten was better qualified to train him in the design and construction of flying wings and how to perfect them than any of the aeronautical engineering departments of the biggest universities which simply do not have Dr. Horten's know-how and experience. At best, they have his text books on the subject and he has gone more deeply into it than any other researchers. The structural

design of the PUL-10 has been thoroughly calculated by a German engineering firm and an airframe has been stress tested with sand bags.

Consequently, we must let the designers be the designers, who do not mind suggestions or questions, the answers to which I have always found most satisfying, but the PUL-10 has to be built as they say in order for it to be the best two-seat flying wing possible. All this means is that all of us on a PUL-10 kit production team place the success of the PUL-10 as a good airplane before any considerations that merely bicycle tire pump our egos, and work on a team under the management.

We are very interested in hearing from anyone who is experienced in manufacturing with fiberglass - especially kit airplanes - who may help us to set up a factory sometime in the not too distant future. I will probably work out details with the FAA on certification and help customers and work on the construction manual for the kit, but if I can work in the PUL-10 factory, I would be an employee of whoever helps us to setup a factory. And besides, I could more easily own my own PUL-10.

Respectfully yours,

Barney Vincelette

(ed. - Thanks for the letter updating us on the progress of the PUL-10. I will also publish your request for team members and anyone with links to a manufacturing organization on the Nurflugel Mailing List. There are a lot of people on the list who are interested in the PUL-10 and may have some of the answers you are looking for.

Keep us informed if you make any contacts and the progress with the tandem seat version.)

June 2, 1998

TWITT:

Thank you so much for all the information I got from the TWITT Newsletter over the years. When I read in the March copy about the new book of David Myrha, I ordered it immediately from Douglas Bullard. Some days ago it reached me and I would like to tell you my impression about this book. You may consider it as a further review after those of Raul Blacksten and Kevin Renshaw, both in the March newsletter.

Sincerely yours,

Karl Nickel
Schlierbergstrasse 88
D-79100 Freiburg GERMANY
Tel. 0 11 49 761 40 31 59 (from USA)

(ed. - Presented below are Karl's comments on Myrha's book. I have printed just as he wrote it so you can see what he felt was good and bad about the book.

I took the liberty of also publishing this on the Nurflügel mailing list and the response was very positive. Many of the list

members had some of the same comments about the book and Karl has provided confirmation of their observations.

Several list members also made the comment, "Wouldn't it be fantastic if Dr. Nickel could publish an interview with his wife that would be first hand accounts of the Horten brother's activities during those early years." I sort of imagine that Karl already has some of this knowledge, and there is a growing desire amongst flying wing enthusiasts to learn of it. The Hortens seem to hold a very special fascination with everyone, probably because they were the early pioneers of tailless aircraft.)

As soon as we received the book The Horten Brothers and Their All-Wing Aircraft by David Myrha, my wife and I started to read that book with the utmost interest. It describes events which are a large part of our lives. My wife Gunilde is the sister of the three Horten brothers, Wolfram, Walter and Reimar and her childhood has been influenced by being witness of the building of the first two all-wing aircraft of her two younger brothers in the parental house and later being told and overhearing all that was going on with later models. She still remembers these years quite vividly. I myself worked from 1942 to 1945 for the Horten brothers and from 1951 to 1955 for Reimar Horten in Argentina. I was engage at the drawing board, made much of the aerodynamic and strength calculations and had also the opportunity to fly most of the Horten gliders as a test pilot. Hence, most probably not many persons know better the circumstances which are described in this book.

From the two brothers Walter and Reimar the latter was the designer and did all the constructive work. My opinion of Reimar Horten always was and still is that he was a real genius as an aircraft engineer. Reimar Horten was awarded the Gold Medal of the Royal Aeronautical Society at August 16th of 1993 (two days after his death). This is the only case where that Society made such an award posthumously and Reimar Horten was only the second German to receive that honor (after Hugo Eckener, the famous pilot of the Zeppelin airships). By the way, Why did David Myrha not report this real unique honor?

Because of my "all-wing" background and my relation to the Hortens and because of my very favorable opinion about Reimar Horten, I was naturally very curious about this book and what tales it would tell. Well, my opinion is quite mixed.

Let's start with the positive side. This book is interestingly written and contains an abundance of photos and drawings. The quality of paper and binding, of printing and reproduction is excellent. It is really astonishing and admirable how much information David Myrha collected, did put together, compiled, analyzed and evaluated about the Horten brothers. You will find in it a large number of persons of the then leaders of Germany and of the German Air Force and a lot of tales and anecdotes how they were related to the two younger Horten brothers. There is also a lot of gossip in it, e.g. how Walter liked to date many girls which prevented him from helping too much to build their aircraft at home. The book also contains the story at length, how the brothers later on made use of the German war machinery to further develop their "dream" aircraft of all-wing type in a large number of models.

Now to the negatives. The book should have the subtitle "Facts and Fiction" with emphasis on the latter because, unfortunately, the facts are often inaccurate or even false. Just one single minor example out of dozens: David Myrha writes (p. 25) "Reimar died in 1994 at the age of 80 years". The correct data are, however, he died August 14th of 1993 at the age of 78 years. (His birthday is March 12, 1915.) When my wife and I met David Myrha in 1986 (November 17th) in the apartment of her brother Walter he explained to us the philosophy behind his writings, "I don't care much about facts, I am essentially interested in the human touch of a story".



NASA Dryden Flight Research Center EC92-04271-4 Photographed 1992 Spacewedge #1 in flight (NASA photo)

ABOVE: Two wings for the price of one. The Spacewedge lifting body (tailless aircraft) descending under a parawing (wing only parachute).

It is understandable that mistakes are unavoidable by doing the enormous task of research for this book, gathering and collecting a huge amount of material and analyzing and evaluating it. In addition to this came the problem, that his two main sources were the brothers Walter and Reimar Horten who both spoke and speak very poor English. Besides, as far as I know David Myrha is not a pilot nor an aircraft engineer himself, i.e. he cannot check wrong statements and facts as an expert. Unfortunately it is not possible to write down a complete list of all the spelling mistakes, errors and faults. Such a list would take more than 20 pages, even that many of them are minor and could easily have been corrected. Why did David Myrha not permit my wife and me the proofreading of his manuscript, as we had offered him to do? Many errors could have been avoided that way.

There are - besides minor errors and mistakes - some parts, however, which are strictly intolerable. I will comment on only one. On page 191 it reads about the accident which destroyed the first twin turbojet-powered all-wing aircraft of the world, the Horten H IX, in Oranienburg and killed the pilot Erwin Ziller about the opinion of the two brothers:

"They recall feeling anger and rage when they received the news, too, that Scheidhauer had not been present in the control tower during this flight and therefore could not offer Ziller help in his time of need. (...Scheidhauer had gone home for lunch) Scheidhauer had disobeyed their orders and in the process may have contributed to the destruction of their only turbojet-powered Ho 9 and its test pilot."

This text is false and a severe insult to Heinz Scheidhauer, **since he was at that day not in Oranienburg but in Göttingen** and could, therefore, not have been of any help!!! Scheidhauer is still alive and could have been contacted before printing such a complete nonsense. There are some more statements in the book which are similarly wrong and can give birth to new myths which are unnecessary and harmful.

Finally, who should read this book? It is of limited value to a historian because of the many mistakes and errors in it. This is true even that it contains such a huge amount of information which is not recorded elsewhere. By the way, David Myrha prefers his own denotation of the names of Horten aircraft, namely "Ho" with an arabic number instead of "H" with a roman number (examples: Ho 4, Ho 9 instead of H IV, H IX). This gives difficulties in cases where further arabic numbers are added (example the H IX-8-229) and may produce some misunderstandings while checking the literature on these aircraft. This book cannot be of any help either to an aircraft engineer who wants to design tailless or all-wing aircraft of Horten-style because technical details and data about the Horten ships are practically nonexistent. But you should read this book, if you are a Horten all-wing enthusiast who wants to know about his heroes, about all those things which happened "behind the scene", of little stories and rumors and tales about the Horten brothers; if you like to look at a large number of mostly excellent but often faulty labeled photos; if you don't care seeing the same photo two or even three times; if you like drawings of the Horten ships, even that they are mostly not very accurate and with missing data (no span, surface area, sweep angle, and so on). But I would strongly recommend as a supplement the reading of this book: Nurflügel by Reimar Horten and Peter F. Selinger.

June 12, 1998

TWITT:

just read the question of Giorgio Cavallo in the June newsletter regarding the correct address for ordering our book Tailless Aircraft in Theory and Practice.

Thank you for printing his full mailing address. I wrote to him immediately and sent him the complete address. Hopefully, this will help him order our book.

This letter did bring to my attention the fact that the advertisement of our book in the newsletter is incomplete, unfortunately. Would you please replace the last two lines in the ad with the following complete text, which is:

* Outside the US, Canada & South America, order from: Edward Arnold (Publishers), a division of Hodder Headline PLC, 338 Euston Road, London NW1 3BH, with the different number ISBN 0 340 614002 1.

Thank you very much in advance.

Sincerely yours,

Karl Nickel

(ed. - Thank you for contacting Giorgio directly since he got the information much quicker that way.

I have included the new information in the advertisement so it will be there for future members to use.)

TAILLESS BIBLIOGRAPHY UPDATE

(ed. - Serge Krauss has communicated to us that he is about ready to publish a limited number of interim bibliographies. He also posted this to the Nurflugel mailing list so there may be more demand than that just generated by TWITT members. If you don't have one of the earlier versions, this may be your chance to get this limited edition for your library.)

I am going to try to keep the Bibliography available by printing as few as possible and still maintain availability until the next revision. I am asking those on the mailing list and at TWITT to respond so that I have some idea of how many to produce past what I'd normally want to stock. But YES, this is a shorter run than usual, and I would term it a "Limited Run".

If the thing runs out, there could again be an appreciable delay before a new edition is prepared, although I hope not. While I could reprint the same edition, I hate to give less than my best available information, and it takes time and additional expense to reformat and (it seems) fight the machine.

My only other concern is to let people know that we have fallen short on cross-referencing. I AM set up for it and can do it in a couple hundred hours, but if I can't get this thing converted to a windows-compatible format, that effort would be wasted, since it is that type of thing that seems not to translate.

NOTE: Bibliography - "a list of writings on a given subject" (Webster)

Tailless Aircraft Bibliography - Edition 1-e

Over 5000 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 350 creators of tailless and related aircraft, including dates and configurations. More. Only a limited number

printed, the first new edition since 1994. Not cross-referenced: 336 pages.

The book will again be spiral (helically/coil-) bound in plain black vinyl. By far the largest ever of its kind - a unique source of hard-core information.

Prices: \$35.00 U.S. and \$45.00 Overseas (checks payable on U.S. Bank)

Thanks.

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

SHA WESTERN WORKSHOP

It's that time of year again for the annual Sailplane Homebuilders Association (SHA) Western Workshop at Mountain View Gliderport, Tehachapi, CA on the weekend of September 5 -6, 1998. Bruce Carmichael has provided the following list of events that will be conducted over this three day period. Although this is not a strictly flying wing type of event, it is well attended by amateur builders like yourselves who are interested in learning more about how to design and build that "dream machine". Homebuilt sailplane owners are urged to bring their ships finished or not. All are urged to bring donations for the SHA Auction.

The airport has a camp ground if you prefer "roughing" it a little, and there are two large motels in the local area (Travel Lodge and Best Western). There is also a small snack bar on the airport for your eating convenience, while SHA will have a Sunday evening banquet for a nominal fee.

SATURDAY, September 5, 1998

8-9am	Joe Alvarez
	Light, Strong Ribs - Salami Method
9-10am	Don Santee
	The S-4 Entry Level Sailplane
10-11am	Dan Armstrong
	The Windancer Light Sailplane
11-12am	Jeff Byard
	Sailplane Design History
7pm	SHA Auction (at gliderport)

SUNDAY, September 6, 1998

8-9am	Wayne Spani
	Rotating Sailplane Wing Jig
9-10am	Paul MacCready
	Regenerative Battery Augmented Sailplane
10-11am	Danny Howell
	The Light Hawk Sailplane

11-12am Al Bowers
Foot Launched 15m Horten Tailless Sailplane

BOTH AFTERNOONS

The afternoons are reserved for visiting, sailplane viewing and flying. A truck pay-out winch will be available for light sailplane and hang glider towing in the evening.

In addition, we have Richard Avalon who will bring his Mitchell B-10 Tailless light sailplane and possibly a Mitchell U-2 and could speak on this subject in case another speaker is unable to attend. Bruce Carmichael will give his illustrated lecture on Ultralight and Light Self Launching Sailplanes from the July 1998 NSM Symposium as the Banquet Speaker Sunday evening at the Apple Shed.

MINI-WINGS

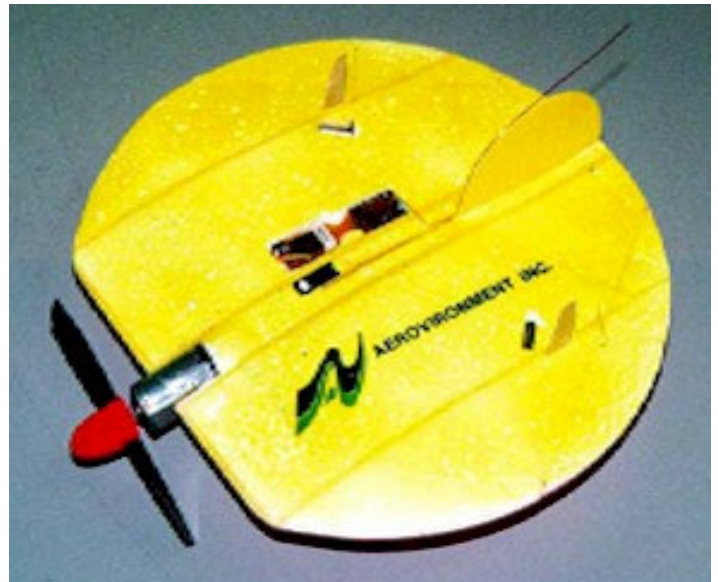
At the March meeting Paul MacCready talked briefly about AeroVironment developing miniature versions of flying wings that will provide video surveillance. Well, the future is not that far way, so it seems.

The May 1998 issue of AEROSPACE AMERICA has an article titled "Mini Technologies For Major Impact", written by J.R. Wilson, pp. 36-42. Part of the article covers Micro Air Vehicles (MAV) which are part of a development program sponsored by Defense Advanced Research Project Agency (DARPA).

A MAV is an aircraft that is no more than 6 inches in length, height and width and weighing only a few ounces. They are intended to provide individual soldiers with reconnaissance and surveillance, battle damage assessment, targeting, sensor emplacement, communications, relay, and sensing of chemical, nuclear, or biological hazards. They will provide real-time imaging at ranges up to 6 miles and have the ability to fly at speeds of up to 30 mph for missions lasting from 20 minutes to 2 hours.

Another use for these type of vehicles would be in an urban setting, providing information to law enforcement agencies through its cameras and ability to place sensors in remote locations.

AeroVironment's version of a MAV is called the Black Widow and its current version can fly for up to 16 minutes and 43 mph (see picture below). The next generation Black Widow will have the computer, command uplink, video camera, video downlink, sensors, actuators, and GPS on one flexible circuit that weighs in at 7 grams. The picture shows it as an oval shaped, low aspect ratio tailless aircraft powered by a small electric tractor motor. It includes a small vertical fin protruding above and below the flying surface which also acts as a housing for one of the transmitting antennas.



Once again, flying wings/tailless aircraft are finding new ways to demonstrate their unique capabilities, no matter what the size.

BITS & PIECES

(ed. - Here are some things from the Nurflügel mailing list members that I thought would be of interest to TWITT members.)

In the latest issue of Air Combat, there are a few pictures of Northrop-Grumman's proposed flying wing UCAV (Unmanned Combat Air Vehicle). Looks like a cross between an F-117 and B-2. Does anybody know of more information on this plane (dimensions, wing sections, etc)? Should make a fun R/C model!

Clark Calkins (ccalkins@schafercorp.com)

Wingspan is 24', length is 27', height (with gear down) is 6'. This thing looks evil. A friend of mine saw one of the pictures in Popular Science and said if he were flying and this came up behind him, he'd eject on sight. Of course, you'd never see it until it was too late..... :)

I'll have to get the Air Combat issue and post some pictures. Northrop has a gift for making 'unusual' looking airplanes.

Doug Bullard

Hi Doug, here is what we found..

<http://209.150.129.157/planes/maucav/maucav.htm>

Al-n-Palmer

I found this too. But the final proposal (I guess it is final) is a much different looking beast. There is a picture of it at http://www.northgrum.com/Corp_web/jpeg/ucav_a1.jpg direct off the Northrop-Grumman site. This is the plane I was interested in...

Clark

I know I have been through this subject before but from the info I have been gathering concerning foils for nurflugels those depicted in Lippisch's book seem to be not suited for this type of aircraft, namely the Me 163B.



ABOVE: Me 163B on display at Cosford (UK?). Photo by Ludo Klock. Source: Kolibri website.

From what I have read these foils do not have the characteristic reflex one would expect. Other aspects of the wing platform do, such as the 20+ degree sweep and the taper ratio. While looking at the Epper foils I realize none resemble the Lippisch foils. They do after scaling resemble very closely the 23xxx series from NACA and although I have been warned about using this series I still find myself pondering the issue.

Am I missing something here and what is it? The Lippisch series (Gottingen?) for the 163A+B does not resemble those of the Storch. I again return to the reasoning of using a symmetrical foil appropriately calculated for geometric and aerodynamic twist, good blunt leading edge for gentle stalling characteristics and mechanical wash-out, for as I have noted from your replies these aircraft are flown with elevons raised and used inboard flaps for trim to alleviate adverse yaw when maneuvering. COMMENTS!!

Regards.....Steve

Can anyone suggest a site or source for flying-wing foils at higher Reynolds Number. Speed range from 50 to 250 mph. Info as Cl , Cm , α_{Lo} etc. would be helpful. THANKS!! Steve

The most extensive aerofoil database I've personally found on the web is at:

<http://amber.aae.uiuc.edu/~m-selig/>

They have a large selection of foils there for hi, low, trans and supersonic speeds.

Keith Young
Sydney, Australia

Yes I am aware of this sight ,but which are for higher Reynolds Number and suitable for flying-wings?? My main interest is for a replica of the Me 163 B.

Steve

Thank-you for all the helpful replies. The foils sought are not on these pages as most deal with modelling and rc stuff, not all I admit. I am seeking foils with higher Reynolds Number and I know they are out there but I think the knowledgeable people do not want me risking my life with half efforts. I assure them I would not risk mine or others on a craft that was not properly engineered and built. I admit I am learning by osmosis; but I am learning

(separating my alphas from my gammas) so any info is always appreciated.

My main interest is in a replica Me 163B; so a 12% foil, gentle stall, 0.0 Cm will do... Comments and criticisms.

Regards.....Steve

Steve,

It is interesting to think of a ME-163 replica, I hope you can see this through to fruition. Did you know a dutchman(?) has a flying (glider) replica? He has plans for adding some powerplant. I will dig through my magazines (quite a stack!) and see if I could get details if you are interested. Also the main test pilot of the Komets is living in New England (Hampshire?) I hear he is still giving glider lessons. (ed. - *Could this be Rudy Opitz?*)

Mark

For Steve, who is interested in building an Me 163 replica.

Have you seen an Me 163 website, whose URL seems to be (I hope!) <http://www.kolibri.lr.tudelft.nl/people/students/fun/rob/model163.htm>

It is accessible through the "Secret Weapons of the Luftwaffe" link in recent Nurflugel-L submissions. In it are photos of a full-scale Me 163 replica glider that one Josef Kurz of Germany first flew in 1996. He plans a 100 hp installation of some kind. Maybe he would share his ideas



ABOVE: Josef Kurz's replica glider. Note the faired tail wheel and main gear tire which are obviously not quite like the original. Also note the more conventional style glider skid versus the retractable landing skid of the real Me 163.

on airfoil choice, since he seems to have been successful thus far. Lippisch's success came from a subtle (careful) blend of sweep/washout and airfoil choice - witness the contrast between extremely enthusiastic test pilot reports and reportedly poor flight qualities of some late production examples, the victims of poor quality control under allied bombardment near war's end. Lippisch remarked the danger of "cooking with someone else's recipes". You should use a modern airfoil and probably not build your own craft until mastering its mathematical treatment. If someone else has already said this, my apologies! I'm newly arrived.

Serge Krauss.

To Serge Krauss.....

I am aware of this site and communicate with its owner. Thanks for the reply as they are all helpful. I fully intend to research the subject thoroughly and if I am not satisfied with the results the replica will not be attempted.

In my book, the wings for the A and B series were to be built by the DFS to maintain quality but I guess after the fall-out between Lippisch and Messerschmitt this matter of quality waned. Too bad.

Regards.....Steve

To Mark

Yes I am aware of this glider, the mans name is Josef Kurz and he plans to install a Subaru 100hp engine. Apparently his glider flies extremely well. Thanks for the reply.

Regards.....Steve

In all the subject matter concerning air foils I have not seen one note on leading edge nose radii?? Isn't it true that a sharp edge gives a sharp break or stall and conversely a blunt leading edge gives a gentler stall, ala the popular foil for gliders; the NACA 4415! Considering the 4415, when it is converted to the flat bottom version why does it give a better L to D ??

Needing to clear up some loose ends...

Regards.....Steve

(ed. - there doesn't appear to be an answer to this.)

Read with great interest the design college page by Chris Hiltz. In it he states that the reason he thinks that the 23012 foil section showed a sharp break was that the twist was wrong. Comments please.

I have not read any accounts of experimenters who have studied the ARUP series of aircraft on the Nurflugels page. I read some time ago a gentleman in the states (an elderly man) who built his version which he called "Little Bird". I no longer have the magazine with the article but his and the original designs showed promise. Excellent short take-off, good speed and a landing in which he states that the circular shape allowed him to simply cut power at about 12 feet and then mush down to a perfect three pointer. The large wing area creating a cushioning effect; relating to STOL performance. He should know as he had flown the original. Any more info on this aircraft?

Regards.....Steve



ABOVE: Rudy Opitz getting ready for a flight in the Me 163. Note the difference in tail wheel configuration from Kurz's glider. (No, that is not a highly efficient secret weapon propeller on the nose!!!)

Source: Kolibri website.