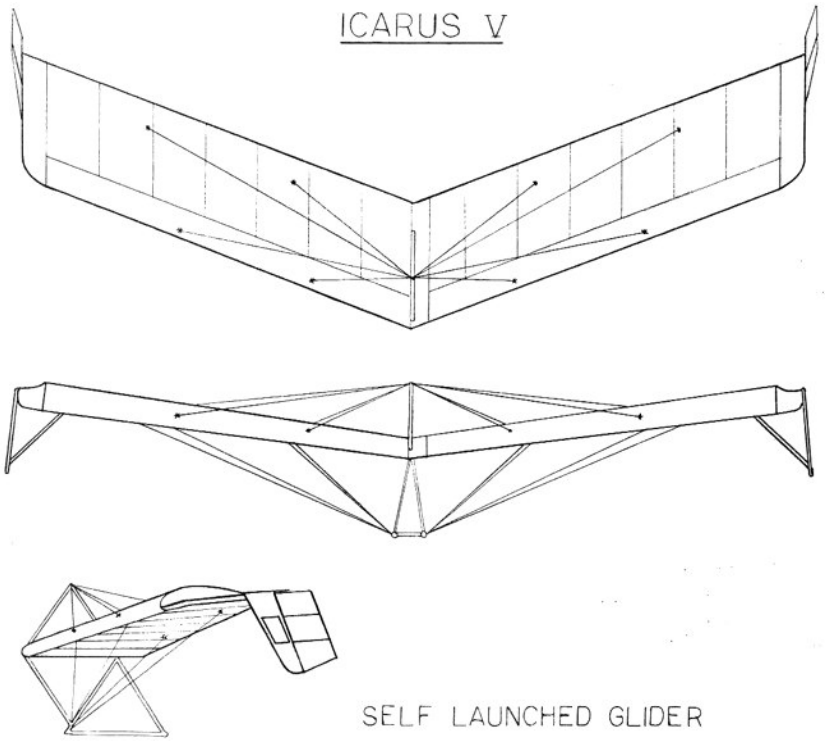
No. 232 OCTOBER 2005

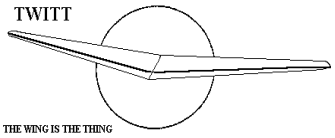
T.W.I.T.T. NEWSLETTER



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., **0510** means this is your last issue unless renewed.

Next TWITT meeting: Saturday, November 19, 2005, 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.

T.W.I.T.T. Officers:

President:	**Andy Kecskes**	**(619) 589-1898**
Secretary:	**Phillip Burgers**	**(858) 581-3748**
Treasurer:	**Bob Fronius**	**(619) 224-1497**
Editor:	**Andy Kecskes**	
Archivist:	**Gavin Slater**	

The **T.W.I.T.T.** office is located at:
Hanger A-4, Gillespie Field, El Cajon, California.
Mailing address: P.O. Box 20430
El Cajon, CA 92021

(619) 596-2518 (10am-5:30pm, PST)
(619) 224-1497 (after 7pm, PST)
E-Mail: twitt@pobox.com
Internet: http://www.twitt.org
Members only section: ID – **twittmbr**
Password – **member02**

Subscription Rates: $20 per year (US)
$30 per year (Foreign)

Information Packages: $3.00 ($4 foreign)
(includes one newsletter)

Single Issues of Newsletter: $1.50 each (US) PP
Multiple Back Issues of the newsletter:
$1.00 ea + bulk postage

Foreign mailings: $0.75 each plus postage

Wt/#Issues	FRG	AUSTRALIA	AFRICA
1oz/1	1.75	1.75	1.00
12oz/12	11.00	12.00	8.00
24oz/24	20.00	22.00	15.00
36oz/36	30.00	32.00	22.00
48oz/48	40.00	42.00	30.00
60oz/60	50.00	53.00	37.00

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

Not a lot to say this month. As usual I am still trying to find a program for November so if you know of someone, please let me know.

I have been promising to get to work on the web site and bring it up to date with some of the new information that has come available of time. However, that hasn't really happened as other things that have been very time sensitive kept getting in the way. I think that is mostly under control for a little while, so I am going to put some time into it next week. So if you know of anything that is wrong with the site or that you would like to see added to the site, please let me know. For added material please provide the necessary link or include it as an attachment in your e-mail (or as a printed piece if you snail mail it).

I want to thank Eugene Turner for sending in the amount of material he did in response to a request for information. However, this is not the only material he has sent us over the years and we really appreciate it. Gavin has added it to the library, which we still do not have an index or catalog of yet. (Maybe someday when I retire I will find the time to start going through all the folders and catalog it.)

We need to thank Norm Masters who has agreed to take on the formidable task of indexing the information contained in the 232 (with this issue) newsletters. He has set an ambitious schedule for getting the first phase done.

I hope everyone has had a good flying season. For those of us on the west coast there is still a lot of good flying weather left as it has been rather hot over the past few weeks. Let us know what you will be doing as you move into the winter building season.

Andy

NOVEMBER 19, 2005 PROGRAM

We were scheduled to have a presentation on the Mitchell B-10, however, while on vacation our speaker was involved in a motorcycle accident and received some severe injuries. He will still be undergoing physical therapy at the time of the meeting, but has agreed to do the program in January 2006. We will continue to try and find a replacement program and hope to have more information for you in the next newsletter.

SEPTEMBER 17, 2005 MEETING RECAP

The three or four of us who gathered at the hanger had a good time just shooting the breeze and discussing whatever came to the surface. We hung around for a couple of hours and then called it a meeting. So you can see to didn't miss a lot, although we enjoyed it.

LETTERS TO THE EDITOR

September 13, 2005

Airfoil

Hello- In response to Bruno Barreto's enquiry in Septembers TWITT Newsletter regarding high lift airfoils that would be useful in a low speed transport aircraft I am including two foil cross sections and ordinates for same. They are my work but feel free to use them, the ordinates are Internet available, they are eminent domain. If you have any questions contact me at Gulfrose@Juno.com

Regards,

Henry E. Whittle

(ed. – Thank you for sending this along. I posted it to the Nurflugel page so Bruno could take a look at the airfoils offered by Henry. I have also posted these at the following link if you would like a copy of it besides what I have included here in the newsletter – http://www.twitt.org/Reflex_Airfoils.html.)

September 13, 2005

NASA GA(PC)-1 Airfoil And Diagonal Ribs

To: Douglas Russell-White

Information on the NASA GA(PC)-1 airfoil can be found in NASA TP 1324 "Low speed aerodynamic characteristics of a 16 percent-thick variable geometry airfoil designed for general aviation applications" by Barnwell, Noonan, and McGhee, 1978. This can be downloaded from the NASA website, go to:

http://ntrs.nasa.gov <-- note that there is no www.

Simple search for: NASA TP 1324

When I did this the report on the airfoil was the 18th item listed

If you don't know the report number or authors name the search becomes a little harder, but you can get there.

I also tried Google's technical search site:

http://scholar.google.com

I searched for: NASA+GA+PC+airfoil

and the second entry that came up was the NASA report referenced above.

As for diagonal ribs, they can replace the drag and anti-drag wires and compression struts found in fabric-covered wings. One of the best examples I can think of is the Ercoupe, which I believe had a root and tip rib with 6 diagonal ribs between them. These ribs went between the front and rear spars and carried drag, anti-drag, and some torsional loading. No wires were needed. The front spar and leading edge took the bending and most of the torsional load. I remember reading somewhere that this was one of the most efficient wing structures made.

Have fun,

James McLellan
jwmcl@att.net

(ed. – Thank you for replying to Douglas and including us so everyone could share in the information.)

September 19, 2005

Sad News @ NASA Dryden

A few of you may know Bob & Marta Meyer. Bob is a Center Associate Director of Programs, and Marta was our Center Chief Engineer. They both enjoyed flying aerobatics competitions, and both were team members representing the USA internationally many times in the last 20 years. This year's USA aerobatics nationals were to be held this week in Oklahoma. Bob & Marta were both there.

It appears that something flew off their Giles G300 while Marta was flying it yesterday. Eyewitnesses reported the plane then went into about a 60 deg dive and impacted the ground. There was no parachute. Marta was killed instantly. The FAA and NTSB are investigating.

Bob & Marta were friends, and neighbors (both at work and at home, they lived around the corner from me in Lancaster, and their offices are around the corner from mine here at work). We're all very stunned, and it's still difficult to believe...

It's a pretty sad day around here...

September 23, 2005

We just concluded the memorial service for Marta Bohn-Meyer here. We had well over a 1000 visitors attend. It was, as expected, a real tearjerker.

At the conclusion of the memorial today, our pilots office mounted a four-ship formation (three F-18s and the F-15) and executed the "missing man" formation (I guess we'll have to rename that one now). It is the first time (I believe) that NASA has flown the "missing man" formation for a woman...

There wasn't a dry eye on the ramp afterwards...

Albion Bowers
<al.bowers@dfrc.nasa.gov>

(ed. – I included this in the off chance that any of our members may know the Myers and hadn't heard of the tragedy.)

September 21, 2005

(ed. - Last month Mike Margulis asked about model plans for a Horten IV and we did get a reply from Eugene Turner who sent along a number of different items from his extensive library. Some of it is general information on the Horten while other is related to a model version. I have scanned what I could to include in this issue so you could see some of it. Some of the text material we also have in the TWITT library and I am not quire sure how much of it will help in building a model versus providing some background information on the Horten designs. I will list what I can if it has titles.

"Flying Wing Glider", By Len Marlow, Air Trails Model Annual '52, pp. 38-39. (Eugene included a blown up copy of the model diagram)

"Six Flying Wings", Western Plan Service, Torrance, CA, 3-view drawings of the Horten I, II, II, IV Pioneer II and Icarus V.

"Performance Analysis of the Horten IV Flying Wing", by Des Georges Falvy, 8th OSTIV Congress, June 1960, as printed in Soar Tech #7, 1987.

Letter (undated) from Flight Engineering and Developments, Dallas, Georgia to Eugene Turner from Henry Cherry on the availability of Horten plans.

German document with airfoil section views and 3-view drawings of the Horten IVb.

I will let Mike know what we have and send him the pieces he thinks he would like to have.

I would like to thank Eugene for taking the time to go through his library and make copies of the pieces he sent along. This is what keeps things going with flying wing development whether it is the full or model sized aircraft.

Below is part of the text from the Flying Wing Glider article to give you an idea of how it was approached by the author.)

"We suppose that everyone, sooner later, gets the urge to try something just a little different. In our case, the Horten designs looked interesting enough to be well worth a try. There were a number of reasons for singling out the IV Model; the efficiency of the full-scale design, the lack of balance problems – due to power installations – in a sailplane, the clean design and attractive appearance of the original and the simple fact that the very high aspect ratio – 21.16 to 1 – rather intrigued me.

That narrow wing, incidentally, does not lead in this case to the weak wing structure you might expect. Surfaces are very flexible toward the tips, of course, but by no means flimsy for a model this size. Three is no main spar, a comparatively heavy leading edge providing most of the support. Spars for the control surfaces provide a little extra starch for the tips. The combination aileron-elevator-drag rudder takes the place of three separate controls, which performed these functions on the large craft.

You'll note that airfoil sections shown are not those that would be employed on a sailplane of conventional design; performance is nevertheless amazingly good. This may, in part, be attributed to the fact that this model has lighter wing area than most.

Wing is constructed in two halves, pinning the leading and trailing edges in place over top plan view and cementing 1/16" ribs between the two. Small pieces of scrap wood must be placed under L.E. and T.E., raising them above the surface of plan so that ribs will fit properly. The trailing edges of both wing halves are raised an additional 1/32", so that the washout specified is built in.

The left wing half is shown, but by placing larger blocks under the edges and inverting ribs, the right wing half may be constructed over the same view. Leading and trailing edges are rough cut and sanded to shape. Control surfaces are built over plan view in a similar manner to wing, and attached by means of soft iron wire hangers.

Center section formers are cut from 1/16" sheet. C2 is notched to fit over C1 and cemented in place. The leading the trailing edges of the two wing halves are cemented to C1, W1 wing ribs cemented to sides fo C2. Add the C3 and C4 formers, and fill in center section top and bottom – except for removable nose section, which is cut from a small block – with dead soft 1/8" sheet balsa. Fillets are made with a mixture of balsa dust and clear dope, which is sanded smooth when dry. Form low hook from a suitable grade of steel wire and cement in place. Ignore location on plan; place hook ½" forward of where your model balances.

Cover all surfaces with a lightweight tissue, including the center section, and apply two good coats of clear dope. Color dope trim may be applied if desired. The two cockpit canopy sections are painted on, using black dope with the gloss killed by adding a small amount of talcum powder.

That's all there is to it; no fuselage or tail surfaces to build. Adjust the glide and it's ready to fly. While the removable nose section was built into the original as a means of placing weights inside and out of sight, no such weighting was necessary. A slight adjustment of control surfaces was all that was required. The function of these controls as elevators probably requires no explaining. To adjust direction of the model, raise surface slightly on the side to which model should turn. The balance point is two inches back from the leading edge, at the center.

(ed. – As a space filler I have also included what Henry Cherry covered in his letter to Eugene.)

"This plan set is all that is known to exist on the must successful of flying wing gliders ever built, the Horten IV. These drawings were taken from microfilm copies of original drawings found in 1973 buried near Horten's old design center. Since the drawings are taken from film they are not the same size as the originals and scale will be different.

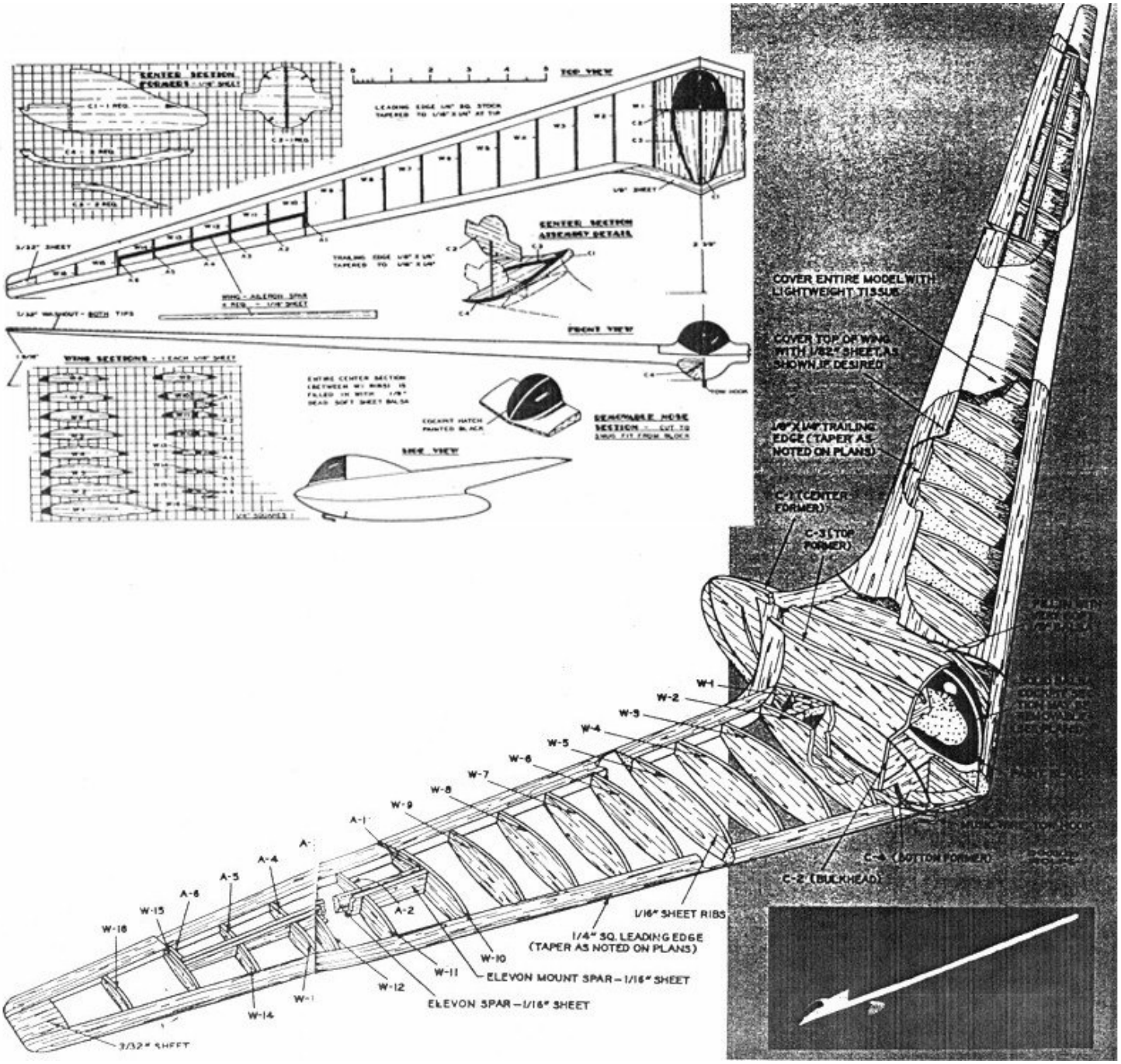
The plans came from the printer very light and time was spent by myself to re-line the drawings so the blue prints would show good detail. Any addition that was made by myself has been noted by my initials (HHC). I also numbered the sheets, upper right hand corner, so to organize the plan set to certain areas fo the aircraft.

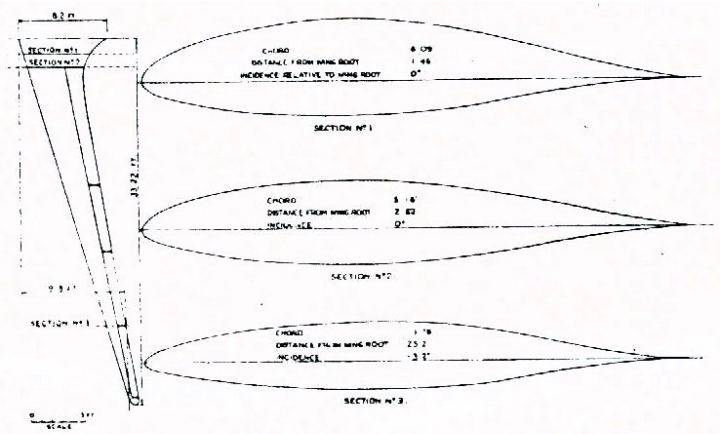
Also available is a 223-page manuscript with stress analysis, theory, control system, and all airfoil coordinates in German. The manuscript comes in a loose-leaf binder and cost $50 postage paid $5 for those who have purchased a plan set. The airfoil coordinates only can be purchased for $10 pp.

When the plan set is not in use remember to roll up and store away from sunlight, or over a period of time the lines will start to fade.

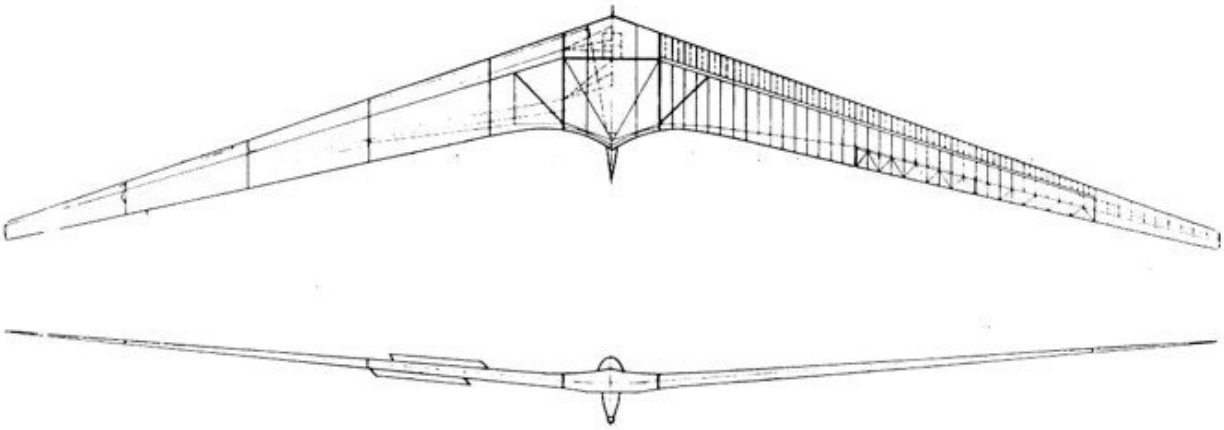
I hope you enjoy the plan set as much as I have. Thank you for your purchase. Some of the proceeds will go to the "Vintage Sailplane Association" that made the plan set possible."

This is the center page section from the “Flying Wing Glider” article included in the material from Eugene Turner. *(ed. – This distortion at the aileron bellcrank is due to the merging of two scanned images so you could see the whole thing.)*

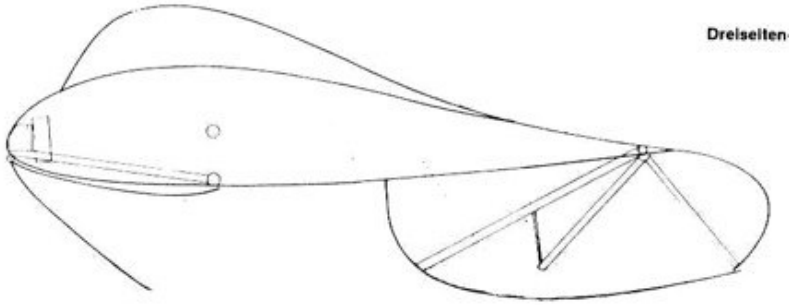


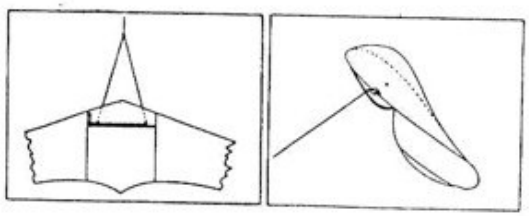


HORTEN IV B.
SECTIONS.



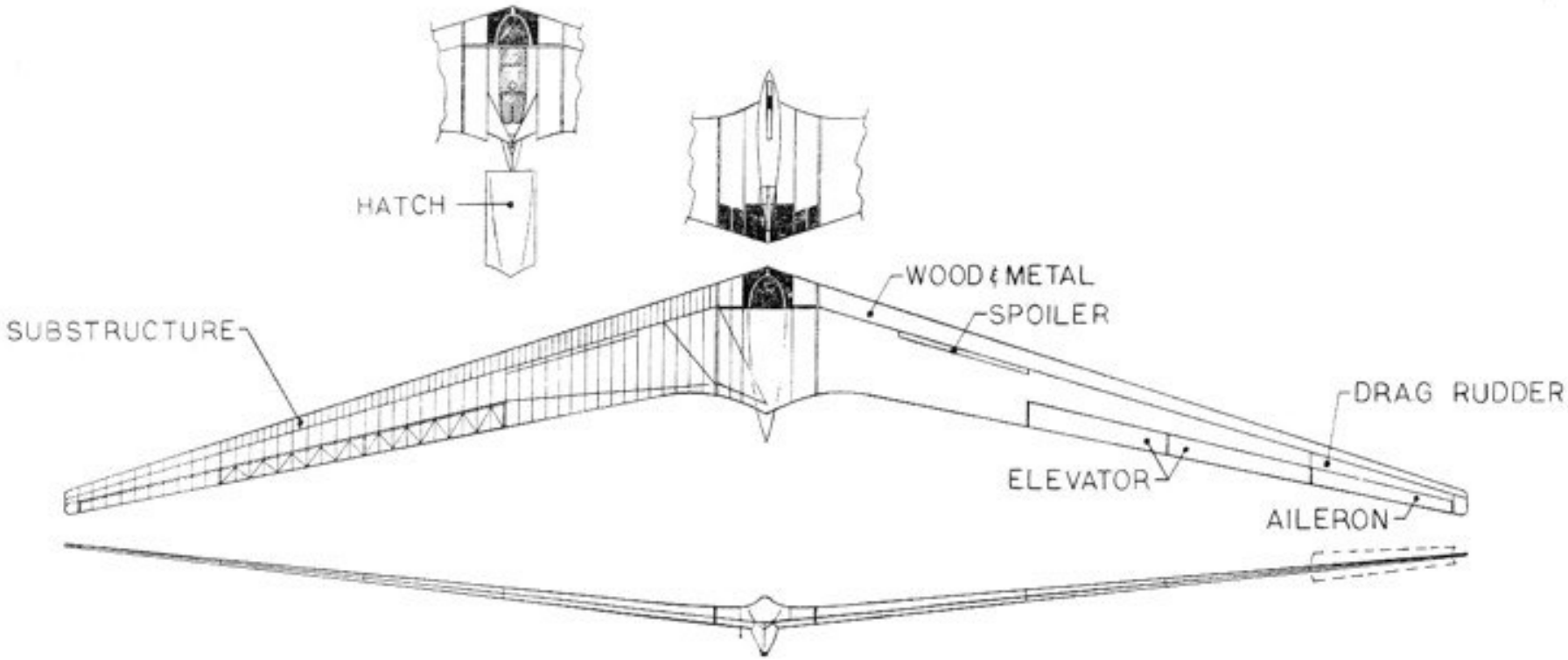
Dreiseiten-Ansicht des H IV-Prototyps.





Double harness for C. G. cable attachment, a post war experiment.

Schwerpunktschlepp mit Gabelseil nach dem Krieg (Thermik).



SPAN	20.0 M.
AREA	18.9 M.^{2}
ASPECT RATIO	21.16
WEIGHT EMPTY	200 KG.
WEIGHT LOADED	300 KG.
WING LOADING	15.87 KG/M.^{2}
GLIDING ANGLE	37:1
SINKING SPEED	0.54 M/S.

HORTEN IV

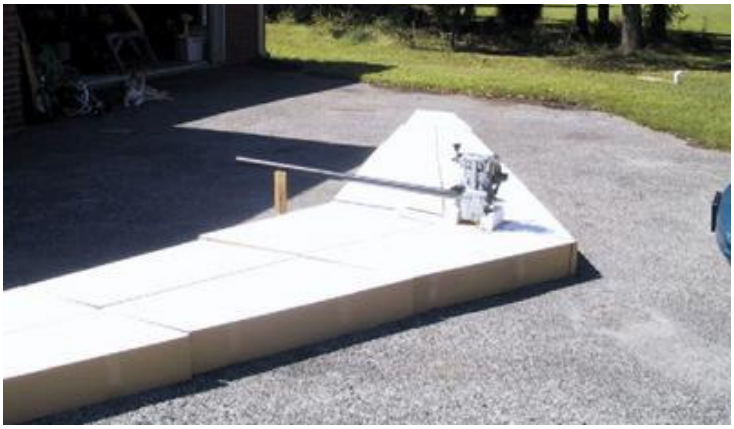
(From the pages of Nurflugel's bulletin board discussion group.)

September 30, 2005

I posted a couple of shots of Longshot on the Nurflugel site, Palmer and I got the "shucks" out this morning (after I talked to you) so I could set the Honda on the center section and get a drive tube dimension as I couldn't cipher it out, to much math. I un-did one of the cores so you could see the reflex in the tip, I am still amazed at all 27' of it, the damn thing is going to be exquisite, maybe next summer (yeah, yeah, we been saying that for years) The Honda is perfect, I have been looking for one for quite some time, we should be able to squeeze 18-20 HP out of it and with Longshot's low wing loading it should do quite well. I am still unsure if a PSRU is worth the effort, Tennessee Props says we can run it direct drive with a 42 X 24 so we will see how it does with a static run up thrust measurement, then make a decision. The carbon fiber drive tube is more than up to the task, rated at 35HP and well over our inertial loading for the prop but the PSRU would require an inertial damper and I just don't think we want to go there, to much engineering.

Al-n-Palmer
Al Robinson
<arobins1@midsouth.rr.com>

(ed. – I have taken the pictures from the Nurflugel album that is stored on the Yahoo Groups site supporting the bulletin board.)



Just looked at your pictures of the Longshot. Hey, looks like a neat thing. I was wondering...with the engine placed there I guess the pilot will be either under the wing in a pod or sitting over the drive shaft with his family jewels near a turning part. Sure hope you have a seat that will not break.

Keep that brain spawning wings,

Koen Van de Kerckhove
<nestofdragons@hotmail.com>

September 28, 2005

I have just returned from the Yorkshire Air Museum, where I was lucky enough to meet one of the Trustees of the Barnes Wallis Trust, which is based at the airfield. They have many drawings, photographs and other documents relating to Sir Barnes Wallis's research into flying wing type aircraft, some of which appear to have variable geometry. There is a picture of Wallis and his staff standing next to a 30-foot (Yes 30 foot!) scale flying wing aircraft attached to a rocket sled prior to some high speed testing. It is unclear where this photo was taken, but there are limited locations in the UK (Shoeburyness?) where this type of research could have been carried out and the location may well be outside the UK in Australia or the United States. (The Trustee believed that this large scale aircraft was tested in the United States) any more info anyone?

My Children and I were also able to see and touch the original Wallis golf ball launching rigs he used in his garden in his home in Effingham and the larger device he used in the testing tank at Teddington. We were all also able to look through the device to gauge the distance from the Monhe Dam wall, (you know the peep hole with the two nails in!) described in the 'Dambusters' film as ' A coat hanger from a three penny bazaar'. They also had a 'Tallboy', 'Grandslam' and 'Upkeep' bouncing bomb on display!

A truly magic museum where you can touch the history and connect to the events in a very personal way.

I asked if the trustees would consider the display of some of the Wallis 'Swallow' and other Flying Wing aircraft (of which there are many) either on the 'Nurflugel' Website or as a link from it to their own. The Trustees said that they would contact me in the next few weeks. Hopefully you will be in for a treat of 1950's 'Nurflugel' Blended Wing Body airliners, freighters and bombers, Variable geometry 'Nurflugel' airliners and fighters and if we are lucky some surviving scale aircraft. The display items were only a tiny amount of the surviving materials. I hope the Trustees will let me return soon to photograph some of the artifacts so you can all enjoy them.

Once again the Website address is;
http://www.barneswallistrust.org/swingwing.htm

Kind Regards to you all;

Mike Gelpi
<the.gelpis@virgin.net>

(ed. – I took a copy of the Swallow picture from their website to give you an idea of what Mike is talking about.

October 1, 2005

Payen Pa.49

Hello,

In an issue of the AVIATION WEEK from 1953 I found a photo of an early configuration of the Payen PA.49, which has not the later nosewheel undercarriage, but just a central wheel and a nosewheel, both are said to be retractable, in contrast to the later configuration. Besides that, it is said that there are no outriggers or skids under the wing. Is there somebody to confirm this ?

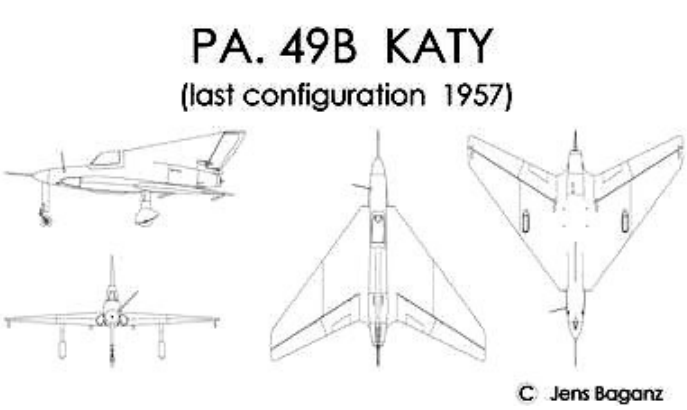
Jens
A_J.Baganz@t-online.de

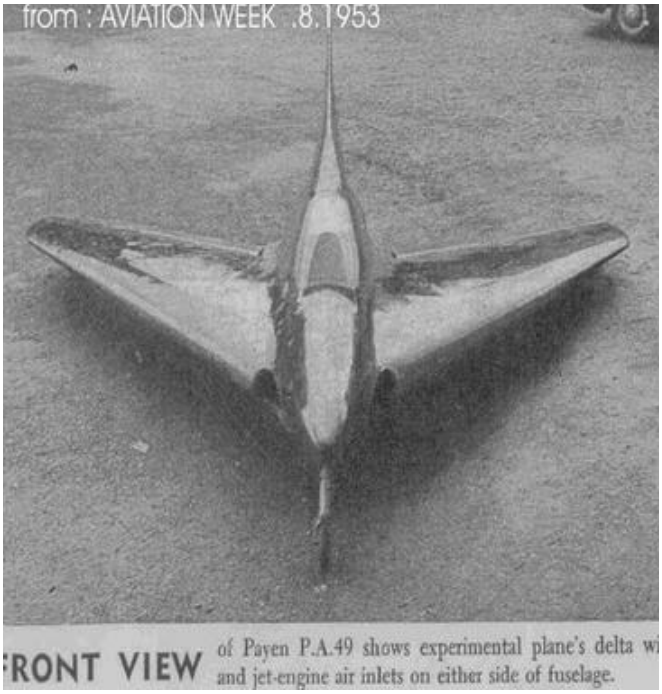
Indeed, in her first configuration, the Payen Pa49 "Katy" was equipped with a central retractable landing gear designed by the ERAM company and built by Payen´s team. Pictures show that two outriggers were installed but I don´t know if they were fixed or retractable.

The "Katy" was wind tunnel tested in this configuration starting in February 1953. Due to an inadequate ground clearance, this gear was soon replaced by a long fixed tricycle landing gear also designed by ERAM. The Pa49 remained with this landing gear during all her test flights.

Philippe Vigneron
<retrofitprsp@yahoo.com>

(ed. – Jens put the following pictures into the Yahoo album section to show what he was talking about.)





AVAILABLE PLANS & REFERENCE MATERIAL

Coming Soon: <u>Tailless Aircraft Bibliography</u> 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.

Prices: To Be Announced

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

<u>Personal Aircraft Drag Reduction,</u> by Bruce Carmichael.

Soft cover, 81/2 by 11, 220 page, 195 illustrations, 230 references. Laminar flow history, detailed data and, drag minimization methods. Unique data on laminar bodies, wings, tails. Practical problems and solutions and, drag calculations for 100HP 300mph aircraft. 3d printing. $25 post paid.

Bruce Carmichael brucecar1@juno.com
34795 Camino Capistrano
Capistrano Beach, CA 92624 (949) 496-5191

VIDEOS AND AUDIO TAPES

VHS tape containing First Flights "Flying Wings," Discovery Channel's The Wing Will Fly, and ME-163, SWIFT flight footage, Paragliding, and other miscellaneous items (approximately 3½+ hours of material).

Cost: $8.00 postage paid
Add: $2.00 for foreign postage

VHS tape of Al Bowers' September 19, 1998 presentation on "The Horten H X Series: Ultra Light Flying Wing Sailplanes." The package includes Al's 20 pages of slides so you won't have to squint at the TV screen trying to read what he is explaining. This was an excellent presentation covering Horten history and an analysis of bell and elliptical lift distributions.

Cost: $10.00 postage paid
Add: $ 2.00 for foreign postage

VHS tape of July 15, 2000 presentation by Stefanie Brochocki on the design history of the BKB-1 (Brochocki,Kasper,Bodek) as related by her father Stefan. The second part of this program was conducted by Henry Jex on the design and flights of the radio controlled Quetzalcoatlus northropi (pterodactyl) used in the Smithsonian IMAX film. This was an Aerovironment project led by Dr. Paul MacCready.

Cost: $8.00 postage paid
Add: $2.00 for foreign postage

An Overview of Composite Design Properties, by Alex Kozloff, as presented at the TWITT Meeting 3/19/94. Includes pamphlet of charts and graphs on composite characteristics, and audio cassette tape of Alex's presentation explaining the material.

Cost: $5.00 postage paid
Add: $1.50 for foreign postage

VHS of Paul MacCready's presentation on March 21,1998, covering his experiences with flying wings and how flying wings occur in nature. Tape includes Aerovironment's "Doing More With Much Less", and the presentations by Rudy Opitz, Dez George-Falvy and Jim Marske at the 1997 Flying Wing Symposiums at Harris Hill, plus some other miscellaneous "stuff".

Cost: $8.00 postage paid in US
Add: $2.00 for foreign postage

VHS of Robert Hoey's presentation on November 20, 1999, covering his group's experimentation with radio controlled bird models being used to explore the control and performance parameters of birds. Tape comes with a complete set of the overhead slides used in the presentation.

Cost : $10.00 postage paid in US
$15.00 foreign orders

NURFLUGEL

"Flying Wing"
by Dr. Reimar Horten & Peter Selinger

350 illustrations
German & English text
Limited number of the "flying wing bible" available
Cost: $49.00 plus $4 shipping and handling

SCOTT flycow@aol.com
12582 Luthern Church Road
Lovettsville, VA 20189 Sole U.S. Distributor

Tailless Aircraft in Theory and Practice

By Karl Nickel and Michael Wohlfahrt

498 pages, hardback, photos, charts, graphs, illus., references.

Nickel and Wohlfahrt are mathematicians at the University of Freiburg in Germany who have steeped themselves in aerodynamic theory and practice, creating this definitive work explaining the mysteries of tailless aircraft flight. For many years, Nickel was a close associate of the Horten brothers, renowned for their revolutionary tailless designs. The text has been translated from the German Schwanzlose Flugzeuge (1990, Birkhauser Verlag, Basel) by test pilot Captain Eric M. Brown, RN. Alive with enthusiasm and academic precision, this book will appeal to both amateurs and professional aerodynamicists.

Contents: Introduction; Aerodynamic Basic Principles; Stability; Control; Flight Characteristics; Design of Sweptback Flying Wings - Optimization, Fundamentals, and Special Problems; Hanggliders; Flying Models; Fables, Misjudgments and Prejudices, Fairy Tales and Myths, and; Discussion of Representative Tailless Aircraft.

Order #94-2(9991) (ISBN 1-56347-094-2) from:

AIAA 1-800-682-AIAA
1801 Alexander Bell Drive, Suite 500
Reston, WA 20191-4344 USA
Members: $59.95 Non-Members: $79.95

*Outside the US, Canada & South America, order from: Edward Arnold (Publishers), a division of Hodder Headline PLC, 338 Euston Road, London NW1 3 BH (ISBN 0 340 61402 1).

FLYING WING SALES

BLUEPRINTS – Available for the Mitchell Wing Model U-2 Superwing Experimental motor glider and the B-10 Ultralight motor glider. These two aircraft were designed by Don Mitchell and are considered by many to be the finest flying wing airplanes available. The complete drawings, which include instructions, constructions photos and a flight manual cost $140, postage paid. Add $15 for foreign shipping.

U.S. Pacific (650) 583-3665
892 Jenevein Avenue mitchellwing@earthlink.net
San Bruno, CA 94066 http://home.earthlink.net/~mitchellwing/

COMPANION AVIATION PUBLICATIONS

SAILPLANE HOMEBUILDERS ASSOCIATION

The purpose of SHA is to foster progress in sailplane design and construction which will produce the highest return in performance and safety for a given investment by the builder. They encourage innovation and builder coop-eration as a means of achieving their goal. Membership Dues: (payable in U.S. currency)

United States	$21 /yr	Canada	$26 /yr
So/Cntrl Amer.	$36 /yr	Europe	$41 /yr
Pacific Rim	$46 /yr	U.S. Students	$15 /yr

(includes 6 issues of SAILPLANE BUILDER)

Make checks payable to: Sailplane Homebuilders Association, & mail to Secretary-Treasurer, 21100 Angel Street, Tehachapi, CA 93561.