No. 140 FEBRUARY 1998

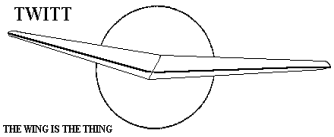
T.W.I.T.T. NEWSLETTER

Front view of Northrop N9-M taken by Bob Fronius at Gillespie Air Show

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., **9802** means this is your last issue unless renewed.

Next TWITT meeting: Saturday, March 21, 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.

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

President: Andy Kecskes	**(619) 589-1898**
Vice Pres: Bob Chase	**(818) 336-5485**
Secretary: Phillip Burgers	**(619) 563-5465**
Treasurer: Bob Fronius	**(619) 224-1497**
Editor: Andy Kecskes	

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: NBKP63A@prodigy.com

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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

As you will see from the minutes, we had a great meeting last month. We had 35 signed-in members and guests in attendance which is probably a new record for a meeting. It was quite a diverse group of people and I don't think we lost anyone throughout the days events. For all of you there who were members, thank you for coming out and making the day such a success.

I have had a couple of requests for audio tapes of last summer's Flying Wing Symposium hosted by the National Soaring Museum. At the present time someone is making copies of the originals made for the sponsors and I will be contacting Paul Schweizer about getting a release to distribute these tapes to the TWITT membership at cost. I anticipate everything should be in place within a few more weeks.

We did receive a video tape from Dennis Karoleski that contains most of the presentations although the viewgraph screen is not visible due to the camera angle and lighting. The speakers on this tape are: Rudi Opitz on flying the Horten IV; Dez George-Falvy on the IV and Kasper Bekas wings; Dr. Paul MacCready flying his ornithopter (battery ran down); Jack Lambie on his Fauvel (I never got his reprint), and; Jim Marske on his Genesis and Monarch. He has the remaining speakers on another tape which he will forward to me later. There is some other flying wing material on the tape similar to the one we distribute. If you are interested in a copy, send in $5 ($7US for foreign delivery) and I will make one for you just as it is (don't want to make another master and degrade the picture quality any further).

For you modellers, B² Streamlines has added a new book to their list. It is "On the 'Wing...the book, Volume 2, which contains more recent articles from their monthly RC Soaring Digest column. I have also added their e-mail address and web-site URL for those of you interested in seeing what other types of material they have available. Their site also has links to other tailless web sites and enthusiasts, so it is well worth the electronic visit.

I'm have been pleased so see all the renewals come in, but I still need your cards and letters telling us about what your doing with your projects. Take a minute and drop us a note.

Andy

MARCH 21, 1998 PROGRAM

Like a lot of interim months, we don't have a confirmed program setup for March. If you have any ideas you would like to present to the group, or can convince someone you know to speak about a flying wing related topic, we are all ears.

If you have a pet project you would like to share with the group through the use of slides, viewgraphs, pictures and/or models, please let us know. We will be glad to block program space for you. The presentation doesn't need to be elaborate, it just needs to relate enough about your project for everyone to understand it.

MINUTES OF THE JANUARY 17, 1998 MEETING

Andy opened by welcoming everyone to the first meeting of 1998. There was a very large crowd for the day's program (turned out to be 35+ over the period of the meeting) and to see some of the wonders Bob keeps in the hanger(s).

Pat Oliver reported that he had visited the Museum of Flight in Everett WA while on vacation and had found they were restoring a F7U-3 Cutlass to flying condition. At that time the engines ran and the hydraulic systems were operational. One problem they were having was getting replacement outer skins, which originally were an aluminum and balsa sandwich affair. Apparently, Boeing is providing a foam and composite replacement for these skins. The museum anticipates to have it flying within the next 2-3 years.

There was a comment about the aerodynamics of the aircraft not being the best. Bruce Carmichael offered that it was the first aircraft in the world to reach .90 Mach and survive, although at .91 is wasn't so good. At that time there wasn't a lot known about transonic flow and one of the problems was the flow at the tail (on a conventional design) was changing drastically due to separation on the wing. This led to the low aspect ratio, delta wing design of things like the Cutlass which then had other problems like high angle of attack. The Cutlass also had the first totally irreversible control system which created problems when it would get stuck between the manual and hydraulic systems with usually dramatic results. They found that the vertical tail size had to be increased when external stores were hung under the wing, but basically the aerodynamics of the aircraft were good.

Carl Walters said he had seen one of the early models and that it had a trailing edge about 3" thick which surprised him and his co-workers. They all expected a very thin, streamlined edge. Bruce commented this thick trailing edge was necessary for the control surfaces to react better in the boundary layer coming off the wing surface. The buildup was usually done with balsa and other light materials to avoid having to increase the already heavy mass balance weights in the surfaces.

Phil Barnes announced he had a new item available. It's titled "Aerodynamic Design Charts for Straight Tapered Wings, with Application to Tailless Aircraft." You can look up the aerodynamic center, lift slope, pitching moment, effects of washout, tape and sweep on spanwise loading and, contains sample calculations for swept flying wings. He had some available there for those interested, and it has been added to the classifieds in the newsletter for the rest of the membership.

It was announced that Gene Larrabee had been named a Fellow of the Royal Aeronautical Society, the world's oldest aeronautical society. Gene has been a speaker several times at TWITT meetings and we all congratulated him on his latest, prestigious award.

Andy announced the aviation world had recently lost two of its pioneers, Tasso Proppe and Volmar Jensen. Tasso owned a Mitchell B-10 and was an active TWITT member until a few years ago as his health declined. (ed. - see below for a short history on Tasso.)

Andy then introduced Gerry Heflin to give us the run down on his SKYLER project. Gerry explained the basis for this aircraft came from his days of surfing and its ultimate goal is to create a sky-surfing airplane that operates in the 30-60 mph range. He knows this is an alien idea to most aerodynamicists, but he explained that you almost had to be a wave surfer to fully appreciate what he is trying to accomplish.

This is the second version of his design. The first model got off the water, but the boat didn't have the power to get it much above ground affect. The ultimate goal is to have an aircraft capable of both water and land launching. Phil Barnes noted that when launching from water it may be necessary to establish a chine on the bottom of the wing to improve its capability to break free of the water. Gerry indicated the first prototype did have a chine that essentially kept the entire perimeter of the wing out of the water when sitting at rest.

The surface of his new version will be covered with fiber glass versus Kevlar like the prototype. He had trouble getting the right resin saturation that eventually caused a split seam which required more work than he had planned.

Gerry then introduced his designer, E.J. "Speed" Hauber. Speed went over the general design philosophy of the craft which are summarized very well in the material he provided in written form.

(ed. - Since both speakers this month provided a lot of written material to accompany their presentations, I thought I would put it in the minutes and then go back and fill in some of the blanks with anything extra that came up during the meeting.)

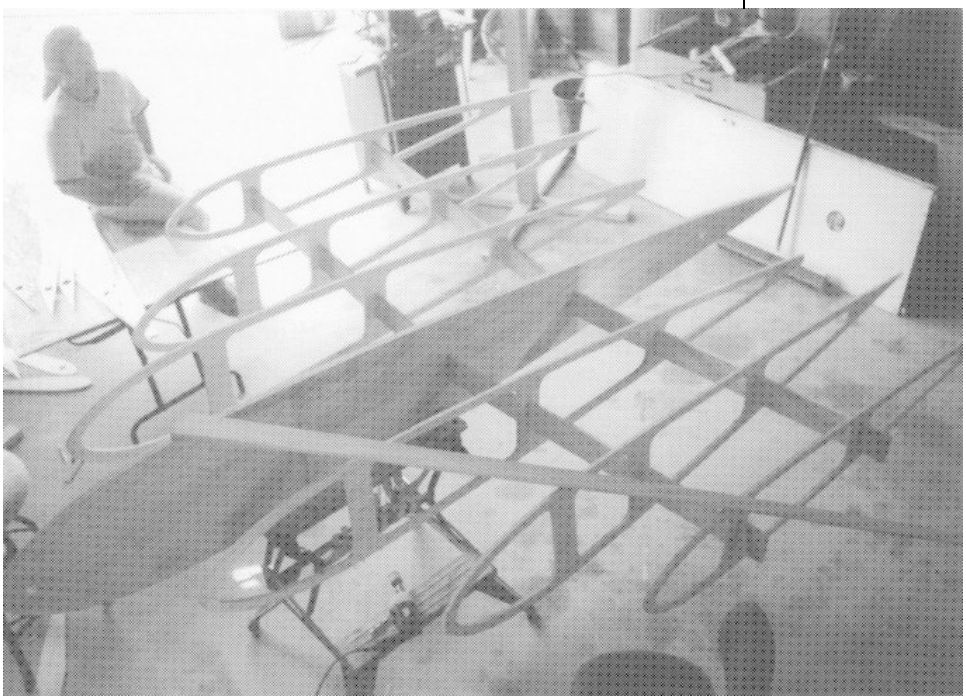
NOTES ON SKYLER

SKYLER was Gerry Heflin's idea and he will be describing the concept and performance objectives.

The E474 section was selected from Profilpolaren for the following reasons:

a. It has good low speed performance (Re from 60,000 to 150,000); operational speeds should be in the 30 to 60 mph range.

b. The section has fairly flat bottom surface for about the 25% chord point to the trailing edge. This allows the wing to plane on the water surface until liftoff is accomplished. It also keeps the nose high enough when it is planing so that there is no danger of plow-in.



ABOVE: Gerry Heflin surveying the construction of his SKYLER sky-surfing delta wing. This is the early stages. Area between ribs will eventually be filled with block foam to provide greater floation.

The delta configuration was selected because:

a. The swept back leading edge reduces wave impact, compared to a straight leading edge, when taking off and landing. The dihedral of the bottom surface also reduces the wave impact area so that the weight of the bottom skin and structure is minimized.

b. The 45º sweepback of the leading edge and fairly large leading edge radius will permit operation at angles of attack in the order of 12º to 18º without stalling. The drag will be high at these angles, but it is assumed that the boat used for towing for takeoff will have adequate power and speed.

When airborne, the attitude of the wing will be controlled by the pilot shifting his weight, similar to the procedure used in hanggliding. However, he will basically be standing or crouched down holding onto a pipe or handlebar as he moves around. This will make it unlikely that a streamlined enclosure can be sued on the top of the wing. It will be necessary to have a controllable elevator to provide quick nose up/down corrections because shifting his weight forward and back cannot be done fast enough to prevent an inadvertent stall.

A pair of narrow rudders are used to hold the elevator in place and to keep the craft from going into a flat spin when the tow line is dropped.

Gerry recognizes that there are some dangers inherent in operating any craft such as SKYLER, but he thinks that is part of the challenge that makes SKYLER interesting. He intends to conduct a series of performance tests, somewhat similar to those used for regular aircraft, in order to determine the modifications, if any, required for adequately safe operation.

The following is Gerry's calculations for SKYLER, dating back to March 1994.

Airfoil section E474 used because of relatively flat bottom for takeoff to prevent trailing edge section hindering takeoff.

From the E474 data sheets, it appears the AOA at liftoff will range from + 7º to 9º. The corresponding values of C_{LO} are 0.7 to 0.9. Wingspan is about 12', average chord is about 3', AR=4. This $C_{Lf} \approx 0.47$ to 0.60, disregarding the ground effect.

Liftoff is projected at 35 mph (51.3 fps) and A ≈ 36 sq.ft (Re ≈ 10^6).

Lmin35 = $0.0012(0.47)36(51.3)^2$ = 53.4 lbs.

Lmax35 = $0.0312(0.60)36(51.3)^2$ = 68.2 lbs.

This is considerably less than the approximate 300 lbs required for craft plus crew.

By increasing the AOA to +11º (near stall), $C_{Lo} \approx 1.0$; C_{Lf} = 0.67 and Lmax = 76.2 lbs. By using a liftoff lift of 300 lbs and these numbers, the liftoff speed must be increased to 69.5 mph which is too high.

Theoretically, the ground effect doubles the AR as the clearance approaches zero. Using this as a reasonable approximation, the value of C_{Lf} becomes 0.8 at AOA +11° and C_{Lo} of 1.0. By increasing the area to 60 sq.ft. in a delta planform and recalculating the numbers, it produces results show is may be feasible to maneuver the aircraft to a nose high attitude, similar to the landing and takeoff attitude of swept wing and delta wing aircraft. The drag is higher, but lift increases substantially with the vortex flow over the leading edges. Calculations for a sharp edged delta indicates a liftoff speed of 35 mph could be achieved, which would be excellent.

This it appears that for satisfactory liftoff at 35 mph, the AOA will have to be about 18°, or approximately double the AOA for a flat bottom surface near the trailing edge. This additional angle (about 9°) is appropriate for obtaining adequate planing lift from a small surface near the trailing edge, thus reducing friction drag.

Two things should be noted, however.

1. The value of C_{Lf} = 1.54 is for a sharp-edged delta. This may not apply to the rounded leading edge of

the E474 section, but in general, the rounded leading edges provide smoother lift curves and comparable values of C_{Lf}, at least for the low and middle ranges of AOA.

2. The shift of crew weight during liftoff may be critical. Weight will have to be shifted aft to get the AOA up to about +18°. This may tend to block the view over the nose. Once the craft is clear of the surface, crew weight should be gradually shifted forward as speed increases. Too rapid a shift will cause the craft to drop back to the surface.

It will be very important to takeoff and land into the wind, and it will be advisable to schedule tests for the times that the wind velocity is substantial. Do not conduct tests when the wind is calm.

April 1994 - It appeared that the weight of the SKYLER was getting too high and Gerry had to reduce the thickness of the plywood ribs, webs, etc. It appeared advisable to determine the liftoff speed for various overall weights. With Gerry's weight of 180 lbs and an aircraft of 100 lbs, the total weight at takeoff would be 280 lbs. A table of takeoff speeds at 10 lb weight increments was developed for weights from 250 - 350 lbs using an aircraft with 97.5 sq.ft. of area. This gave a takeoff speed range of 35.3 to 41.7mph, respectively.

These calculations indicate that when the craft attains an AOA of about 18° on takeoff, it should lift off the surface of the water at speeds in the range of 25 to 30 mph, but then to remain airborne at lower AOA (about 12°) the speed should be increased rapidly to about 35 to 42 mph. This speed increment of about 10 to 12 mph should be fairly easy to achieve because the towing boat will tend to speed up automatically as the planing water resistance of the SKYLER drops to zero on liftoff. During the time of this speed increase, the crew weight should be shifted forward gradually to decrease the AOA.

After liftoff, it will be important to keep the towline taut. If the towing boat slows down and then speeds up when the line slackens, the line can then snap the craft down or to one side. The same can happen if the AOA of the craft is lowered too quickly. It is under these conditions that a controllable tail surface can prevent a crackup.

December 1995 - The calculations of February '94 indicate that the center of lift is about 5.1' forward of the trailing edge. This figure may have to be revised.

At the root section, the normal center of lift will be at the quarter chord point; i.e. 2.13' aft of the forward tip or 5.8' forward of the trailing edge.

For each triangular section of the wing, the center of lift will be approximately at the intersection of lines drawn from each corner to the mid-point of the opposite side.

Thus the center of lift for each triangular section of the wing is 2.1' forward of the trailing edge. The area of each triangular section is 36.1 sq.ft. or 72.2 sq.ft. total for both sections. The area of the center section is 34 sq.ft. Thus, moments about the trailing edge are:

$72.2(2.1) + 34(5.8) = (72.2 + 34)\ D_{CL}$

D_{CL} = 3.3 ft. forward of the trailing edge.

These calculation show that the center of lift is much further back than initially estimated (3.3' instead of 5.8' from the trailing edge). This appears to be verified by Gerry's comment in July '94 concerning "had to get way back" during the fist test.

The results of this calculation indicated that the crew control station will have to be moved about 2 1/2 ft. aft of its initial position. It further emphasizes the need for a horizontal stabilizer to control the pitch angle of the craft and it also shows that it would be advisable to do further testing before making the production molds.

After Gerry and Speed made their presentations, the group took a break so they could go out on the ramp and walk around the SKYLER and ask specific questions of the builder and designer. Along with the basic airframe, they had also brought the prototype windscreen they think will help protect the pilot from some of the wind forces, and several blocks of floatation foam that will be fitted in-between the ribs.

As you may remember from the photo of SKYLER in the October newsletter, it had the two vertical surfaces to support the elevator. Phil Burgers talked with Speed about making a small change in the configuration by spreading the base of the verticals out several feet to form more of a triangular shape. This would provide a stiffer structure and prevent any possibility of oscillations being setup in the vertical sections during flight.

Andy then reconvened the meeting back in the hanger so we could have the second part of the program. Phil Burgers was introduced and took the floor to give us report on one of his visits to Argentina where he gathered information about the Horten Iae 38 cargo plane.

Phil gave us an overview of what he would be covering during the day, including wetting our appetite with the promise of some drawings he obtained directly from Dr. Horten during a trip to Argentina. Big cargo carrying aircraft would be the emphasis today.

He explained that Horten's ideas for flying wing cargo aircraft sort of originated from designs by Junkers where all the cargo was carried within the wing area. By getting as much cargo into the wing, it reduces the wetted area of the aircraft.

One of the larger cargo aircraft Horten envisioned was a flying wind tunnel. Most have seen the picture of this concept where there is a wing sitting on top of what looks like a square, open-ended tube. The model aircraft would be mounted in the center and then the wind tunnel flown at the desired speeds to accomplish the evaluation.

Horten's design gradually changed to having cargo completely within the wing to having a cargo area hung below the wing. This improved the amount that could be carried and helped in keeping the CG under control.

Phil was asked why Dr. Horten had not come the US at the end of the war. Apparently he didn't want to, but later had a change of heart and had written Alexander Lippisch a letter inquiring about the possibility of moving to the US from Argentina. It seems that Lippisch never answered him and Horten didn't pursue the issue any further.

At this point Phil led us into the main part of his presentation. The information below was provided by Phil and covers this subject much better than I could try to transcribe the presentation.

I. Ae. 38 - HORTEN FLYING WING CARGO AIRPLANE

Presentation by Phillip Burgers at TWITT
January 17, 1998

The following information of this incredible airplane comes directly from Horten himself, via personal communications or articles written by him.

INTRODUCTION

Once upon a time, Dr. Horten was told that he was going to be flown to a certain unspecified place at the end of his working day. After he asked one of his co-workers to notify his wife, he boarded a DC-3 and flew to Santa Rosa, a location in Cordoba, Argentina, a privately owned to Brigadier Mayor Brigadier Ojeda, of the Air Ministry. He told Dr. Horten that he wanted to build a city in the middle of the orange groves there. Brigadier Ojeda had in mind using a large cargo glider that could be snatched by a low flying Lancaster bomber from the Argentinean air force and tow it 1000 km to Buenos Aires. This idea had its origin in the Me 321, in Germany, during the war. These giant airplanes could carry up to 20 tons of payload

This is how the “naranjero” or “orange carrier” got its start.

REQUIREMENTS AND DESCRIPTION

In October, 1950, Horten receives, for the Aeronautics minister Brigadier Mayor Ojeda, a requirement for a cargo airplane, single place capable of carrying ten tons of cargo, with a radius of 1000 kilometers. This airplane may be towed to save fuel, increase its range and in case of engine failure, be capable of landing safely at the same airport.

Dr. Horten chose the flying wing for smaller manufacturing costs, smaller friction drag and reduce in almost 40% the storage volume for such airplane. Other elements already constructed in Argentina at that time were to be used, like engines, wheels, shock absorbers, hydraulic cylinders would reduce the cost of the airplane.

Four engines were preferred to two for the reason of extra power needed in case of an engine failure. In certain flight regimes, it was calculated that in the case of a twin engine airplane, the percent increase in power of the remaining engine is 100%, and in the case of a four engined airplane, the power is increased only by 33%.

Desired cruising speed is around 220 km./hr. The airplane was to be flown by one pilot during the day and could accommodate a navigator for nocturnal flights, reducing operating costs. This airplane would also be converted as troop transport, ambulance or used against fires. A metallic structure guaranteed long life when hangars were not available for storage. Engines to be used were the I. Ae. 19 “El Indio” of 750 hp.

DESIGN AND PERFORMANCE

The original prototype was intended to have a take-off weight of 17.5 tons. This value went up to 20 tons due to the heavier “El Gaucho” engines and the more fuel that went with them. “El Indio” engines were not available, but “El Gaucho” engines (320hp) were and adopted for the first prototype.

A ventral ramp was designed so that it could open in flight for parachute dropping.

Structure was “semi-monocasco” and the wing of 36.5 degrees of sweep, presents a twist of “the half to the tip of the wing” (?) of 10 degrees. One single spar holds the **bancadas** of four of the engines. Useful load is 10 tons. Safety factor adopted was 4.5 with a weight of 20 tons. The airplane could be divided into three main sections, forward central and aft:

The **forward** section was considered the apex of the wing, forward of the main spar. The pilot is located above the stored nose gear, and its door, when open, allows for the entrance of the pilot.

The **central** section is 4.8 m long and 2.2 m wide with a useful cargo volume of 23.4 cu.m.and a door that communicates with the forward section.

The **aft** section had two large clamshell doors that, when closed, can add 8 cu.m. more of useful cargo volume. Wind tunnel tests showed that opening during flight was possible.

The nose landing gear had only one wheel and each of the main gears had two wheels in series, attached to the fuselage and their relative position to it would show the placement of the center of gravity of the loaded airplane. Distance between main landing gear wheels was 2.8 m. Ten shock absorbers for the main landing gear and two for the nose landing gear allowed the machine to land with a vertical speed of 3.5 m/sec.

Aerodynamically speaking, there were two issues that do strike as uncommon for a Horten design: fences in the wing and vertical surfaces at around 80% of the wing’s semispan with rudders that would open only outward.

Center of gravity position shifts are critical in flying wings. How did a cargo flying wing manage such situations?

After 40,000 hours of design and 350,000 man hours for building the aircraft, it was ready for flight testing... nine years later!

FLIGHT TESTING

There were four test flights. The first was frightful. Control stick was stuck all the way backwards and the only way to keep it flying was at maximum power around the field and land again. During this first flight, it never exceeded 100 meters in altitude.

Second test flight was by the Air Minister while Mr. Balado was hanging from the stairs leading to the pilot’s seat (no copilot seat was available) near the nose landing gear structure.

Heavier and underpowered, the performance of the airplane was far from impressive. Hanging from four two “Rotol” propellers it took to the air.

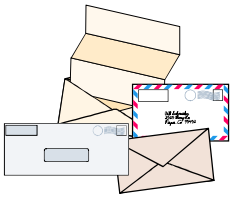
The I.Ae. 38 prototype was painted mat black and this brought several comments on the stealth character of it. It actually was painted black to better observe tufts attached to it during flight testing. Northrop personnel did visit Cordoba in 1953.

What is left of this airplane? One propeller survives at the airclub "Los Caranchos" in Cordoba.

OTHER RELATED PROJECTS

Dr. Horten had performed calculations on the same airframe powered by two Rolls Royce "Nene" or "Derwent" jet engines. With the Nene engines, the airplane could carry 35 passengers, crew of four, range of 2,000 kilometers and a cruising speed of 650 km/hr. Derwent performance would be similar with a lower cruising speed of 550 km/hr. The I.Ae. 38 was the last flying wing design that Horten supervised.

After Phil's well received presentation, Andy conducted the raffle with the following winners: Gerry Heflin - bundle of shop rags; Kathleen O'Rourke - am/fm radio; Bernie Gross - personal alarm; Helga Peters - camera, and; Bruce Carmichael - am/fm radio. He then thanked everyone for coming and adjourned the meeting.



LETTERS TO THE EDITOR

1/20/98

TWITT:

Please note here-under some pieces of information which could be of help for the TWITT members.

For the book Tailless Aircraft in Theory and Practice by Karl Nickel and Michael Wohlfahrt, the address in the UK is:

Edward Arnold Ltd.
338 Euston Road
London NW 1 3BH
United Kingdom

Price is £40.00 (=+ mail charge of 15% = £46.00)

A book has been written by Mister H.P. Dabrowski and published in last March by PODZUN-Pallas Verlag Gmbh (Kohlhauserstrasse, 8-D-61200 Wolfersheim Berstadt, Germany in the Serie Waffen-Arsenal-Specials, Band 18, "Nurflugel-Ein Streifzug durch de Geschichte Deutscher und internationaler Entwicklungen", ISBN 3-7909-0601-8, Price DM 24.80.

Concerning the book of David Myhra presented on page 2 of the January issue of the newsletter, I am a little bit confused because I was informed by Mister Russell Lee, curator of the NASM, that the book was published by Schiffer Publishing and I saw in the newsletter that it comes fro Aeroplane Books. As I am interested in buying the book, please could you give me an address where to order it.

Concerning Bob Fronius' inquiry for which regard the Horten IV, I can give three addresses, which may be already known. (See below.)

I have also a question. Maybe somebody can help. I have received from Mister Hans-Peter Dabrowski a copy of page 59 of the August '95 issue of the periodical Aeroplane Monthly. This page includes a photograph of an aircraft presented as a Horten design. This seems not possible but I do not know which could be this aircraft. Does anybody know something about this aircraft? I am sorry for the poor quality of the copy which is due to the multiple copies.

I wish you good receipt of this letter. I thank you in advance and remain,

Yours sincerely,

Eric du Trieu de Terdonck

Mister Hans-Peter Dabrowski
Elisenstrasse, 41
D-30451 Hannover
Germany
(Has written several books on Horten & flying wings)

Deutsches Museum
Flugwerft Schleissheim
Attn: Mister Peter Hanickel
Effnerstrasse, 18
D-85764 Oberschleissheim
Germany
(Restoring a Horten IV)

Horten-Archiv
c/o Mister Edward Uden
Gebruderstrasse, 38
D-25355 Barmstedt
Germany
(Has the estate of Dr. Reimar Horten)

(ed. - Thank you for all the information. I will add the street address in London and the prices to Karl Nickel's advertisement in the newsletter.

As for the publisher for Myhra's book, I took it from one of the messages on the nurflugel mailing list when news of the book first came out. Doug Bullard is selling them through a deal with Schiffer at a slightly reduced price. The address is:

Douglas Bullard
14525 SW Forest Drive
Beaverton, OR 97007

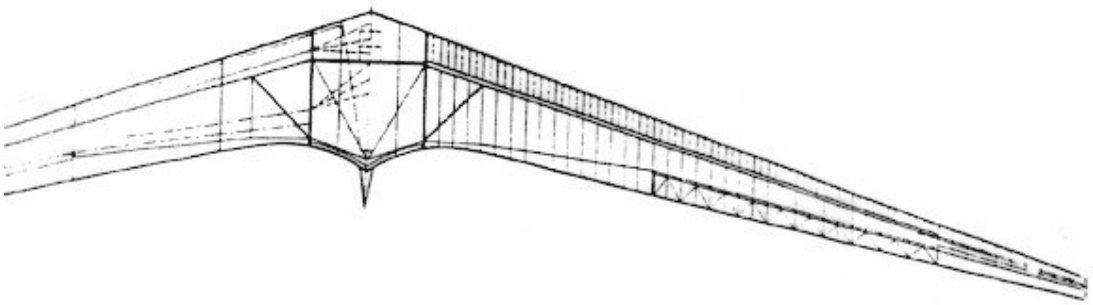
Price is $55 US for overseas destinations, including US Postal Service postage and handling. Allow 4-5 weeks delivery overseas. For those of you in the US, the price is $51, including postage & handling. [The base price is a $15 discount over the Schiffer price.]

I will publish the picture you sent along and hope that it comes out at least well enough for someone to recognize it. Perhaps Karl Nickel or Peter Selinger might recognize it from either Horten or another designer of that era in Germany.)

RECENT PUBLICATION

The Winter '97/'98 issue of BUNGEE CORD, the Vintage Sailplane Association's newsletter contains a very fine article by Russell Lee, Curator, Aeronautics Department, National Air and Space Museum, Smithsonian Institution. It is aptly titled: "The National Air and Space Museum Horten Sailplane Collection: Horten II L, IIIF, IIIH, and VI-V2.

Russ prefaces the article with the following: "This is not



a complete operational history. It is more an account of what happened to these sailplanes after World War II. They had little military value during the war and never flew again after it. Why were they worth saving? The answers begin here. Exploring this misunderstood period discloses some mystery, a fair dose of neglect, and bouts of intense official and public interest. I thank Jeff Byard, the VSA, and enthusiastic Bungee Cord readers for allowing me to tell this story."

The article is 8-pages long and includes a number of pictures of the Horten aircraft being torn down for shipment after the war. There was one section of some historical interest since it covered Horten sailplanes being inspected by Northrop engineers.

"By 1946 the three sailplanes resided at Freeman Field. Then on October 22, 1947, as Stanley A. Hall explains in his forward to Horten Tailless Sailplanes, the Air Force loaned the Horten IIIf, IIIh, and VI-V2 to Northrop in Hawthorne, CA, after 'joint petition of Northrop Aircraft, Inc., and the Southern California Soaring Association (SCSA)'. Northrop requested the sailplanes 'for purposes of inspection by west coast engineers who, in interests of the development of all-wing aircraft, sought for evidence of similarity between the design practices of American and German engineers'.

"Northrop personnel planned to test-fly the two Horten III aircraft but they arrived 'damaged beyond reasonable repair (and) too badly damaged to make photography worthwhile'.

"Despite their condition, a throng of aeronautical professionals turned out to inspect them. Among the curious crowds were Northrop engineers and students of Northrop Aeronautical Institute, members of the Society of Automotive Engineers and the Institute of Aeronautical Sciences. Many SCSA members turned out including engineers from Douglas, North American, Lockheed, and Consolidated Vultee."

(ed. - For those interested in reading the entire article and viewing the pictures, you can write to Jeff Byard (the BC editor), 13555 El Camino Real, Atascadero, CA 93422, and see if any copies remain and can be purchased. An annual subscription is only $15, so the cost of a quarterly newsletter shouldn't be too expensive.)

1/4 SCALE H IV

Last month we published a request from Bob Fronius for information on Horten IV. He has received responses from several sources and sent along the following:

Our request for information on the Horten flying wing has been successful. We still need more drawings and pictures of the aircraft we are modeling. We also need the same material on the trailer depicted on page 101 of Nurflügel by Reimar Horten & Peter Selinger. Gavin Slater, TWITT Archivist, is helping to build the 1/4 scale trailer.

We contacted Selinger, who contacted Karl Nickel, who in turn talked with Heinz Scheidhauer. Karl and Heinz have both flown these ships.

We now have an agreement on the exterior covering material and finish color. This was supplied by Russell Lee of the NASM.

Harald Buettner of Tehachapi, California, is constructing the 1/4 scale model of Werk Nummer 25, LA-AC, N79289. Molds and plugs are being developed.

We wish to duplicate LA-AC as it was before Robert Kronfeld flew it in a transport to England. Hollis Button bought it from Kronfeld and imported it to the Dakotas where Rudy Opitz picked it up for rebuild and later entered the '52 Nationals.

Bob, Gavin and Harald would appreciate any additional help you may be able to give in gathering together documentation of this aircraft. This is an ambitious project and is construction of the wing cores is moving along at a steady pace.

If you have anything of interest, please send it or a copy to the TWITT post office box labeled for Bob.

This just came in via the Nurflugel mailing list from Russell Lee and I seemed appropriate to include it here so everyone has a better idea of what is behind Bob's project. This information was not included in Russ' BC article since it didn't cover the Horten IV.

For nurfluglers interest and entertainment, a short history of this interesting soaring machine (H IV), now displayed at Ed Maloney's Planes of Fame, Chino Airport, California.

WNr. 25, rolled out of the Gottingen workshop April 28, 1941, assigned national registration D-10-1451 and wartime aircraft code LA-AC. September 1945, Robert Kronfeld loaded it aboard Handley Page Halifax and flew

it to Farnborough, England for testing. First Farnborough flight October 11, 1945; on static display there along with large collection of Luftwaffe aeronautica October 29-November 9, 1945. More testing followed, one of the towplanes used was captured Fiesler Storch Fi 156 bearing Air Ministry codes AM 101/VP546. Farnborough allocated code VP543 to the H IV on April 26, 1946, and they continued to fly the wing until late 1947.

Test pilot Capt. Eric Brown conducted the first of several flights in LA-AC on May 13, 1947. His excellent report published in Wings of the Weird and Wonderful (Airlife 1983). About 500 flight hours clocked on the sailplane by this time, according to Brown (from maintenance log-books??).

That summer, Sir Richard Fairey's son Richard reportedly flew the H IV at Farnborough. It impressed him enough to attempt to hire Reimar Horten to work at Fairey (account in Myhra “The Horten Brothers...”).

Now state property, Kronfeld had to buy back the H IV from the British Ministry of Supply, sale transacted December 8, 1947; H IV transferred to Lasham February 17, 1948. H IV stored at Hawkridge Aircraft Co., Ltd. in Denham autumn 1948 to May 1950. May 7, flown twice by Robert C. "Jock" Forbes at College of Aeronautics, Cranfield; sold to Sq. Ldr. F. Crocombe who registered it with British Gliding Assoc. as BGA 647. Sold to U.S. Air Force Capt. Hollis E. Button for $2,500; stored briefly by Glider Press, Ltd., shipped to Valley City, ND, Button's hometown.

Crashed on first takeoff attempt, loaned to Rudi Opitz for one year in exchange for flight-worthy repairs. Opitz obtained U.S. Air-worthiness Certificate May 15, 1952, reg. N79289; Wright Memorial Glider Meet, May 1952, Opitz and H IV won the meet. Competed in Mid-West Regional Championships, July 4-6, 1952, Toledo, OH; Opitz again won the meet. Competed in 19th U.S. National Soaring Contest, August 19-30, Grand Prairie, Texas. Opitz placed 7th but earned his Diamond "C", one of only 5 or 6 in the world at that time.

Button sold N79289 to Mississippi State University under program run by Dr. August Raspet; C of A expired May 1953; MSU reblt. glider; C of A renewed October 26, 1959. Advertised for sale in May 1964 Soaring magazine, sold October 1964 to John Caler, North Hollywood, CA, now 708.5 hours on the glider. Sold to Prof. John L. Groom, Redlands, CA; sold to Ed Maloney, restoration completed 1994/95.

IN MEMORY OF TASSO PROPPE

Tasso Proppe was born in 1910 in Gemany and had been involved in some form of aviation since 1927 when he started helping people glue glider together.

By 1934 he had earned his Silver C badge, #33, and participated in an international glider meet at the Wasserkuppe piloting the sailplane “Wuerttemberg” for the Stuttgart flying club.

In 1936 he earned his M.S in Aeronautical Science and did three years of post graduate work. In 1939 he became the Chief Instructor for the German Engineering Test Pilot School. After the war he was a technical manager and gliding instructor with a British occupation forces recreational gliding school in Oerlinghause, Germany.

By 1953 he was an instrumentation systems engineer at the USAF Missle Test Center. From there he moved on to work for General Dynamics Convair in systems engineering, systems safety and maintenance engineering on missiles, spacecraft and aircraft programs.

He flew motorgliders for many years in Southern California and wrote a variety of articles on the subject for the Motorgliding magazine. He owned a Mitchell B-10 which he flew and had made many improvements.

Tasso was a friend and “devils advocate” of TWITT and will be missed.