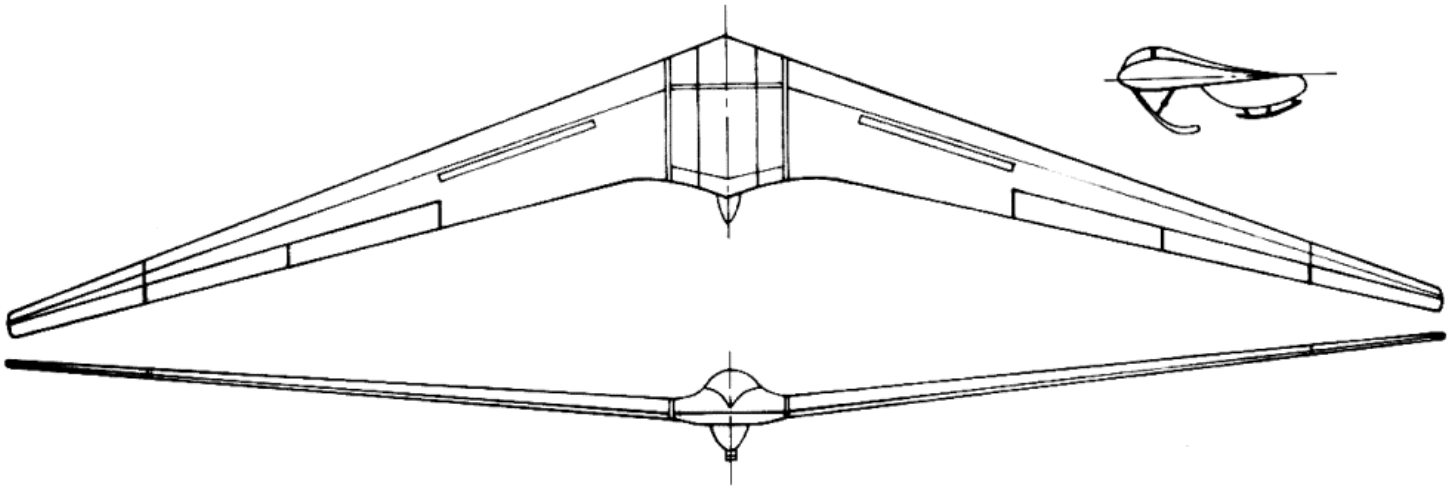
No. 376 NOVEMBER 2017

T.W.I.T.T. NEWSLETTER



Horten IV 3-view. See page 4 for the start of a translation of a German magazine article on this flying wing.
Source: http://www.aviastar.org/air/germany/horten_ho-4.php

T.W.I.T.T.
The Wing Is The Thing
P.O. Box 20430
El Cajon, CA 92021

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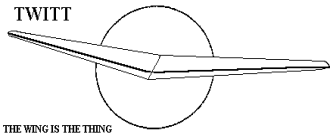

THE WING IS THE THING (T.W.I.T.T.)

T.W.I.T.T. is a non-profit organization whose membership seeks to promote the research and development of flying wings and other tailless aircraft by providing a forum for the exchange of ideas and experiences on an international basis. T.W.I.T.T. is affiliated with The Hunsaker Foundation, which is dedicated to furthering education and research in a variety of disciplines.

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Meetings are held on the third Saturday of every other month (beginning with January), at 1:30 PM, at Hanger A-4, Gillespie Field, El Cajon, California (first row of hangers on the south end of Joe Crosson Drive (#1720), east side of Gillespie or Skid Row for those flying in).

TABLE OF CONTENTS

PRESIDENT'S CORNER

Here is your issue for November, a little late as seems to be my schedule lately.

Most of this issue is taken up by the translated text for a German magazine article on the Horten IV. This is good since the photocopy I have is so light it can hardly be read and the pictures won't take another copy event and be useable. I thumbed through the Horten IV images using a Google search and noted that some of what is in the article can be found on the Internet so I may include some next month.

My thanks to Jason Wentworth for his excellent research e-mail linking other flying wings to the Marske Pioneer 2 shown on last month's cover.

I imagine everything will come to a halt with the approach of winter weather. My part of Texas is seeing much lower temperatures now with more frequent rain showers at night. The rain is welcomed to help keep water use to a minimum, but the thermals are rapidly disappearing in strengths that will support my glider so I don't see a lot of flying ahead.

That's all I have for this month. Hate leaving so much white space in some of the issues, but it can't be helped based on what is available for publishing.

Andy

LETTERS TO THE EDITOR

Hello Andy,

The photograph of Daretanyan Ingram's Marske Pioneer 2 tailless sailplane, featured on the cover of the current (October 2017) issue of the *T.W.I.T.T. NEWSLETTER*, reminded me of a sailplane concept that would mesh perfectly with the Marske Pioneer design formula to yield an "easy to store & transport, fly from almost everywhere, by almost everyone" aircraft.

The German ULF-1 (see:

https://en.wikipedia.org/wiki/EEL_ULF_1 , http://eel.de/english/ulf-1_description.htm , and

www.google.com/search?ei=K_r1Wb7-OojmjwOv1rWYCg&q=ULF-1+foot-launched+sailplane&oq=ULF-1+foot-launched+sailplane&gs_l=psy-ab.12...10744.11539.0.14702.2.2.0.0.0.0.112.212.0j2.2.0....0...1.1.64.psy-ab..0.0.0....0.O6eG8zLsli8)

is a foot-launched, low-performance (its best L/D ratio is 18:1) sailplane. Jim Marske's tailless Monarch (see: http://www.kollmanwings.com/) is rather similar in performance (although not in configuration, of course) to the ULF-1, but it is not foot-launch-able.

A foot-launched, tailless sailplane that combined the simple, lightweight construction materials and methods of the ULF-1 with the configuration of the Pioneer 2 (perhaps with a somewhat simplified fuselage shape, to facilitate easier home construction using the ULF-1's materials and methods) would be inexpensive, easy to build, lightweight, safe and fun to fly, and easy to store, transport, and assemble/disassemble. Its ability to be foot-launched would make its easy transportation less important in many cases, however, as it could be stored at and flown from/to the same location (in the cases of many rural owners). In its disassembled form—the "pod fuselage" and the two wings—it would take up little space in a shed, barn, or garage. Also:

There is no reason why it, like the Marske Monarch, could not also be tow-launched by a car (or even by a horse, as was sometimes done with the Bowlus Baby Albatross) or take off using a small self-launching engine (or electric motor) with a propeller, if the owner happened to live in flat, hill-less country. There are many people, myself included, who would be ecstatically happy to be able to have such an affordable, "minimalist" sailplane which would also be such an "easy keeper" (taking up little storage space, being easy to put together and take apart, etc.)—and having the sailplane be a *tailless* one would be "thick and tasty icing" on the cake! Such an "every(wo)man's sailplane" would also be financially lucrative for the manufacturer/plans seller, because more people could afford—in terms of logistics, time, storage, and money—a "garage glider" than can afford a regular sailplane and its ownership requirements (tow plane fees, airport or gliderport ground storage or hangar storage fees or a special-purpose transport/storage trailer, etc.).

Jason Wentworth

Daimler Benz is using these to promote their electric vehicles.

Bob Storck

AVAILABLE PLANS & REFERENCE MATERIAL

Coming Soon: Tailless Aircraft Bibliography Edition 1-g

Edition 1-f, which is sold out, contained over 5600 annotated tailless aircraft and related listings: reports, papers, books, articles, patents, etc. of 1867 - present, listed chronologically and supported by introductory material, 3 Appendices, and other helpful information. Historical overview. Information on sources, location and acquisition of material. Alphabetical listing of 370 creators of tailless and related aircraft, including dates and configurations. More. Only a limited number printed. Not cross referenced: 342 pages. It was spiral bound in plain black vinyl. By far the largest ever of its kind - a unique source of hardcore information.

But don't despair, Edition 1-g is in the works and will be bigger and better than ever. It will also include a very extensive listing of the relevant U.S. patents, which may be the most comprehensive one ever put together. A publication date has not been set yet, so check back here once in a while.

Prices: To Be Announced

Serge Krauss, Jr. skrauss@earthlink.net
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VIDEOS AND AUDIO TAPES

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

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 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

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.

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The purpose of ESA 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 cooperation as a means of achieving their goal. Membership Dues: (payable in U.S. currency)

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Make checks payable to: Experimental Soaring Association, & mail to Murry Rozansky, Treasurer, 23165 Smith Road, Chatsworth, CA 91311.

The following four pages is the start of a translation provided by Johan Prins probably sometime in the early 2000s. I didn't go into the back issues to see if I put it in a newsletter in the past, but I don't recognize it as a previous piece. I will include the last pages next month.

The pictures and images in the original article are too bad to reproduce but I think most of them have been on the Internet so you can do a search on Horten IV and scan through them and sort of identify by the article's description.

Title Page:

Title : Horten IV, the most mythical of flying wings

Article of Alain Pelletier in the french magazine "Fana de l'aviation", September 2000, loosely translated by Johan Prins

Subtitle:
With their extraordinary outlines, the jet-propulsed flying wings of the Horten brothers have always nourished the fantasies of those who wonder what the German Luftwaffe would have been in 1946. This is of course a way of neglecting the fact that the Horten brothers were actually soaring pilots, and that they made the most exceptional sailplane of it's time.

Start of Article: Page 13
In the Germany of the 30's,the year of the soaring community was marked by the yearly championships in the old volcanic mountain range of the Rhön, placed in the middle of Germany between Bavaria, Hessen and Thüringen. It's highest hilltop is the Wasserkuppe with 950m over sea level. In 1934, during the 15th championship, a few sailplanes with at least unexpected shape appeared. These gliders were made by two young students from Bonn, Reimar and Walter Horten. They had already made themselves known to the modelist's community due to their participation in their championships, and had then decides to go one step further and build a full-size sailplane.
Being inspired by the tailless planes of Alexander Lippisch, they had designed a flying wing that they built in... their parent's dining room.
During that 15th championship in the Rhön mountains the Horten H1 did only one flight, but was found so impressive that the Horten brothers got the price for innovation, worth 600 Reichsmark at the time.
This was just what the Horten brothers needed to carry on with their work. They made the Horten II of which two units participated in the 1937 championships, where they did not do really well, and they ended up as almost last on the list.
The Horten's further improved the design and built two Horten H.III which participated in the 1938 championships together with one H.II.
The following year, four H.III entered the championships and the best got only to place 14.

A Difficult birth
Far from being demotivated, Reimar Horten started to have a quite exact idea of what his next sailplane would look like, but the second world war was about to start. As of august 1939, it became difficult for Raimar Horten to continue building sailplanes in the training center in BErlin where he worked, together with Walter, on several new H.III's. Also, Walter, then fighter pilot, was about to join the JG26 squad, based in Cologne-Ostheim. So Reimar decided to go back to his parent's place in Bonn and to continue his university studies of mathematics, but also to build his new high-performance sailplane together with friends on the airfield Bonn-Hangelar.
Designated the Horten H.IV, this sailplane had a span of about 20m, a glide ratio twice that of the H.III (21,1 instead of 10,7) and a high aspect ratio. In order to reduce the drag of what was left of the fuselage on the H.III, the pilot would be lying prone in the new wing, in a position inclined by 30°, sometimes called a "praying mantis" position *
By means of a handlebar far up front and a pair of rudder pedals far aft, the pilot could move three sets of elevons that took almost all of the span. The rudder pedals actuated a pair of drag rudders.
In addition, there were two pairs of spoilers in the wing.

Footnote (*): it is not clear if the expression "praying mantis" position was really used by Reimar Horten.

During the month of september, 1939, Germany went to war. Reimar quickly completed his set of calculations and plans for his new sailplane. In april, 1940, he was enrolled at the fighter pilot's instruction centre of Nuremberg-Fürth where he followed trainings foir air defense tactics. Three months later he was

transferred to the military freight glider command unit near Braunschweig to receive flight lessons. Here he ran into Heinz Scheidhauer, one of the pilots on his Horten III during the Rhön championships.
As of that day, both only had this one idea: to build the Horten IV.
At that time, just after his recent military sucesses, Hitler planned to invade England. As part of this plan, Reimar Horten received order to convert two H.II and three H.III into ammunition transporters. While making these modifications, he secretly built a wooden test setup of the central part of the new Horten H.IV with the help of Scheidhauer. This allowed him to finish the ergonomic studies and he could define the final dimensions of the cockpit section.

Secret building
The modifications on the H.II and H.III were finished, but finally were of no use, since due to the result of the air battle over England, the invasion plans were cancelled.
Reimar Horten was sent to Königsberg-Neuhausen as a technical advisor, while Scheidhauer was sent to the flight training centre of the same airbase.
Reimar secretly got a workshop organized, where he undertook the building of the H.IV together with a few others who were, just like himsel, passionate about flying wings.
Later Reimar Horten said: there were many soldiers there who were waiting for orders, having nothing to do. It took me only little time to make them flying-wing-enthusiasts (2)

(2) Footnote: citation from the book of Peter F. Selingr "Nurflügel, die Geschichte de Horten-Flugzeuge" Ed. Weishaupt Verlag, 1983.

In January 1941, the building of the H.IV could not be kept secret anymore. One of the participants in the workshop, named "Luty", was unable to keep the secret and had talked about it here and there at the airbase. Before the airbase commander, Major Reeps, could get the news frow just anyone else, Reimar Horten decided to talk to him directly about it. To his great surprise, Major Reeps did not have any objections agains the on-going construction, under the condition that the work would go on only at night time and during the week-ends. From then on the building work went much faster, also due to the help of several Luftwaffe pilots who used to be Horten pilots during the Rhön championships.

Everything went smoothly until the day when high-ranked officers came to inspect the air base. While visiting the training facilities, they saw the H.IV. "What is this?" asked General Kies. As an answer to Major Reep's explanation, he said "We can't waste any time on this kind of kid's things" (3)

(3) Footnote: As per D. Myhra in his book "The Horten Brothers"

Immediately after the departure of the inspection crew, Reimar Horten received the order to get the plane to a place not belonging to the air base. This would have worked with anyone, but noth with Reimar Horten, who, a few days later, went with some others to see Major Reeps in the officer's mess, where they started to make him drunk, until, due to the alcohol, he gave his o.k. for the sailplane staying in the workshop, if only it would be quickly finished. One month later, in august, 1941, the H.IV was completed. Immediately, Reimar attached the ship to a glider winch and got Scheidhauer to make a first flight. everything went smoothly, and Reimar decided that he could immediately proceed to a first aero-towed flight.

Insert page 14: Why without tail?
The rear control surfaces that act as a stabilizing device on a classic airplane are just the more heavy and drag-creating as they need to be held by a boom or fuselage. The flying wing principle can do without this additional weight and drag. Theoretically, an "auto-stable" or reflexed airfoil allows the designer to avoid the use of traditional stabilators. The flying wing though, has stability problems in certain flight configurations [at least with standard trailing-edge-flaps -Trad] which to some extent are solved on some flying wings by using vertical surfaces like on the french Fauvel flying wings. On this picture, from left to right, the Horten H.IIa, IIIb and IV.

Heinz Scheidhauer got into the cockpit and was towed by a Heinkel He.46 of the training centre to 3000m and stayed up for more than an hour.The flight tests continued , still without official approval, and the plane got some 50 hours logged in one month. The "praying mantis" pilot position proved very comfortable, and particularly during his longer flights, Scheidhauer would praise that new cockpit design and pilot position. For him, the H.IV "was really an extraordinary sailplane and the prone flying position was real advantage without downsides."
After that, even while Reimar Horten was working on other projects, three other H.IV were built in Göttingen: the No. 24, which had it's first flight on februaary 11, 1943; the No. 25, which first flew on april 28, 1943, and No. 26, which had first flight on june 20, 1943. Heinz Scheidhauer did most of the flights on these planes, logging about 1000 hours on them.
A few months earlier, Walter and Reimar Horten had the privilege to see the third prototype of the Messerschmitt 163a do a spectacular flight. They were highly impressed by the speed attained by this plane, but had also recognized the little autonomy of this rocket-propulsed plane.
This is why they decided, when designing the Horten H.IX later, to use turbojet engines instead.
During the design phase of the Horten H.IX, Reimar needed some more data and decided to do comparisons between a H.IV (In this case the No. 26 flown by Scheidhauer) and a Darmstadt D.30 "Cirrus" flown by Hans Zacher. The D.30 was a conventional sailplane that then was considered to be the best German sailplane. It had about the same wingspan as the H.IV (20.10m) and a higher aspect ratio than the H.IV (33.6).
The test consisted of an aero-tow with both gliders being unhooked at 3000m simultaneously, then photographs were taken at regular intervals, but this method did not show any real difference between the two planes. The fact that none of the two was a clear winner of the test flight frustrated Reimar Horten so much, that he immediately decided to design a even higher aspect-ratio wing , the H.VI.

Hidden in the woods
The last months of the war were mainly spent on finishing off the H.IX, the heavy cargo plane H.VIII and on the design studies for the supersonic fighter H.XIII. Almost nothing is known about the use of the H.IV sailplanes during that period of time, but this does not mean that no one would talk about them anymore. When the allies entered Germany, they found and took prototype planes everywhere, and also the Horten planes were picked up. From march 11 to 16, 1945, a crew of allied aviation experts came to the Horten's house in Bonn, where they only found a drawing assistant named F.V. Berger. He gave detailed explanations about the various models of the Horten planes....

Picture top of page 15: The horten sailplane H.IV No. 24, registration LA-AB. A man was placed in the cockpit in prone position and the canopy just laid on (Horten archives)
Picture bottom of page 15: A unidentified Horten IV, registration D-??? (Germany) which seems to have been ground-looped (?) around it's left wing.

....and in particular about the jet fighter H.IX, abvoiusly the only plane the inspectors were interested in. After that, a tour through the workshops and test facilities in Germany was organised in order to search and find as many planes as possible, but the journey turned out to be dissapointing, a single sailplane was found in England (Maybe a H.IV?)
Documents of 1945 prove that the allied forces knew about the existence of a H.IV, but were not in a hurry to get to see it. In a telex, the IX. Air Force Service Command said on july 1945: "The How Four was not inspected. It's state is unknown. It is stored in a trailer at 35km from Rottweil. Mr. Schmitt should be able to bring us there."
Finally, a group of british aviation engineers, sponsored by the Tailless Advisory Committee, went to Germany to have a in-depth discussion with the Horten brothers about their planes. The members of this group were Squadron Leader R. Kronfeld, (Airborne Forces Experimental Establishment - AFEE), Mr. Prower (General Aircraft Ltd.), Mr. Watson (Armstrong Withworth Ltd.), Mr. Lee (Handley Page Ltd.), K.G. Wilkinson (Royal Aircraft Establishment - RAE).
The results of these missions seem not to have been very important, since in october 1945, the RAE's report about it contained only about 30 pages.
However, one person got more from these visits than the others: Robert Kronfeld, a german jew and sailplane pilot who had won the Rhön championship in 1928. In 1934 he had left Germany and went to

Austria, then to the United Kingdom. It may be that his sailplane-pilot's past allowed him to get onto friendlier terms with Reimar Horten. In Göttingen, Reimar Horten told him that sailplanes would be grounded for quite some time in Germany, and that he still had a H.IV in a hidden place."It is hidden in a trailer in the woods. You can take it to England and fly it, if you like, under one condition: you bring it back as soon as sailplane flying starts again in Germany." Kronfeld accepted immediately. A few days later, Horten led him to the place where the sailplane was hidden. It was brought to Göttingen and loaded into a DC3 Dakota which took off for England. As to Eric Brown though, the H.IV arrived in Farnborough in august 1945 in a Arado Ar.232, not a Dakota. The H.IV had it's first flight in England on october 11, 1945, and from october 19 to november 9, it was displayed in the German Aircraft Exposition, before continuing the test program that was part of a wider flying wing test program, in which other flying wings like the Baynes "Bat", the General Aircraft Ltd. GAL56 and GAL 61, a Messerchmitt 163B (used as sailplane) and the Armstrong Witworth AW.52G participated.
In 1946, the horten H.IV got the registration number VP543 and flew intermittently until 1947. It seems that it was damaged during that series of flights. On december 8, 1947 it was sold to Robert Kronfeld, but was still at Farnborough when Kronfeld accidentially got killed while at the controls of the GAL 56 "Medium V".
The Horten H.IV left Farnborough on februaary 17 and was delivered to the the poeple who were in charge of executing Kronfeld's last will, namely H.E. Bolton of Hawkridge Aircraft Ltd. and K. Polack and F.F. Crocombe, head of the design department of General Aircraft Ltd., who was surprised to find out that Kronfeld had acquired the Horten.
Shortly after that, a USAAF captain named Hollis E. Button bought the sailplane for 2500 Dollars. The sailplane was reassembled in the first days of 1950 in the Aeronautical College of Cranfield. H.E. Bolton supervised the work. As to F.F. Crocombe, nobody would then want to test fly the plane. Finally Flight Lieutenant Robert C. Forbes, chief instructor of the sailplane training school of RAF Detling was paid 250 Pounds Sterling - quite a sum at that time - for the job. On may 7, 1950, two test flights were made without any difficulties, and the sailplane was then registered under the number N79289 in the USA.
The next day, on may 8, 1950, Forbes sent a letter to Hollis E. Button in which he expressed his frustration:
"As a matter of fact the Horten has forged itself a bad reputation since it fell into the hands of the british

forces. Don't believe a word of all that. This bad reputation is only due to ignorance and lack of experience. Honestly, if I had 2000 pounds, I would have bought this plane in your place, so now I'll have to do with my "Weihe".(4)....
(4) Footnote: The "Weihe" was later also built as "Nord 2000" in France.
.....Forbes also gave Button a few useful hints in his letter in order to "not to break it even before having flown it"
"I will only make one remark, and please don't be angry about it: Let nobody else than yourself fly the plane, otherwise it will quickly be broken, I can assure you. This is the plane of a single man."
He ended: "I can't tell you anything more, except that you posess the best sailplane in the world."
The H.IV was then disassembled and sent to the home town of Button, Valley City, North Dakota. Unfortunately, it rolled over at landing on it's first flight and was severely damaged. Since he did not have the plans and no workshop wanted to do the repair work, Button got in contact with Rudolf Opitz, who was known for having been one of the test pilots on the Me.163 Komet.

Championships

Opitz: "I have accepted to do them in my spare time and in exchange Hollis would let me use it during a flying season" remembers Opitz. The Horten IV was repaired and got it's civil U.S. registration number on may 15, 1952. Opitz participated in two regional gliding championships, among which the Midwest Gliding Championship in Toledo, Ohio in july, 1952 and won them. Later, at the end of august, 1952, he entered the 19th national gliding championships, organized by the Soaring Society of America at Grand Prairie, Texas.
The Horten made a great impression due to it's stability and maneuverability and got to place 7 with 1530 points.