No. 259 JANUARY 2008

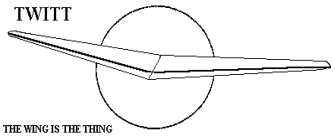
T.W.I.T.T. NEWSLETTER

Earlier this year, the Air Force Research Laboratory put out a little noticed article about Northrop Grumman's Supersonic Tailless Air Vehicle (STAV), a concept that could someday lead to a supersonic aircraft. Unlike the DARPA-funded "Switchblade" flying wing project, this research, sponsored by the Air Force Research Laboratory, is aimed primarily at supersonic flight, thus the long and slender design. Sources: http://blog.wired.com/defense/2007/10/tailless-aircra.html & http://www.wpafb.af.mil/news/story.asp?id=123055800

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., **0801** means this is your last issue unless renewed.

Next TWITT meeting: Saturday, January 19, 2008, 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:

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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).

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PRESIDENT'S CORNER

I hope everyone had a very joyous holiday season and got through the New Year's celebrations with a minimum of hangovers or throbbing headaches. I had a great Christmas eve with family and friends, and then a rather quiet New Year's eve at home.

While in the process of rearranging the hanger Gavin found an error in the numbering of the newsletter issues. Somehow I had managed to assign No. 253 to the August 2007 issue when it had already been used in July. So with this issue you will see a jump from issue No. 257 to No. 259 to get everything back on track. I will go back and make the corrections on the electronic copies and republish them on the web site for any of you interested in printing a new cover page.

I would like to thank Phil Burgers for suggesting a possible program and giving me the contact name. See more about what we think the March program will look like on the next page. I will have more information for the next issue, but for now please mark your calendar for March 15th and plan on attending.

I have exhausted my stash of newsletter material with this issue, so if anyone has something they would like to share with the group, now would be a very good time to send it in either by snail or e-mail.

I know some of you in the middle of the country and on the east coast are going to be buried under some snow for the next couple of weeks, so while you are working on your project how about taking a few pictures and write some captions.

Andy

JANUARY 19, 2008 PROGRAM

There is no program for January, but we have a tentative commitment from Christopher Alan to do the March program. This will feature the Ligeti Stratos project shown below. The all-composite, joined-wing, ducted fan Ligeti Stratos was originally conceived in 1982 by Charles Ligeti,

of North Balwyn, Victoria, Australia. The designs for the second generation will be released as Open Source through this web site, and development will continue and expand though a community of skilled collaborators, enthusiasts and individual builders who are interested in contributing to the fulfillment of Charles Ligeti's original vision of a compact, super-efficient, high performance personal aircraft. You can see more in this aircraft at: http://ligeti-stratos.com/concept.htm

LETTERS TO THE EDITOR

December 12, 2007

Thanks for hanging in with an interesting news letter on a subject that has been fascinating to me for decades.

Please renew my subscription with the attached check.

Charlie Person
Birmingham, AL

(ed. - I would like to thank Charlie, Henry and Ed for the continuing support. I am always pleased to hear that our members are enjoying the material I include in each issue, but sometimes it gets hard to find new and interesting information. So please let me know if you find something that should be shared and snail mail or e-mail it to me.)

December 13, 2007

Please find my attached check for renewal of membership for 2008.

The Project 306 that has been covered by reprint and reader input for the past three months in the TWITT newsletter is not covered in the Boeing archives online at all. I am continuing research into this tailless Boeing paper series of projects, but have the sense that it was a make-work project that kept workers busy at the drawing boards while the B-17 and B-18 were being considered by the military. It was quickly forgotten after the big contracts were signed early in 1935.

Regards,

Henry Whittle
<Gulfrose@juno.com>

(ed. – If anyone has access to the Boeing museum archives or other paper based records that might confirm Henry's conclusion, we would sure like to know.)

December 19, 2007

Enclosed is a check for renewal of my membership in TWITT for the year 2008. Thanks for your part in assuring the membership of access to some information.

Best wishes for a pleasant holiday.

Sincerely,

Ed Labahn
Dana Point, CA

December 23, 2007

Hello:

I just got in contact again with Mr. Michel Mangenot, the guy who has the Pelican/Vampyr firm. He brought sad news.

Keep that brain spawning wings,

Koen Van de Kerckhove
<nestofdragons@hotmail.com>

PS. Enjoy the holidays.

"Hi Koen

Thanks for your reply.

Concerning request from people interested by Pelican/Vampyr bad news! Molds were in storage and were destroyed by new owner. it was inside all molds for Pelican, Goeland one pair of wings for Goeland ....

So you can tell to your customers that I only can provide drawings (250 € including postage) to build a Pelican/Vampyr with wooden fuselage.

Again happy New Year

Michel Mangenot"

(ed. – It is always sad to hear such news, but at least the plans are still available for the ambitious builder.)

December 23, 2007

Hi Bob: (Hoey)

I have only made one bird model many years ago. It was a Turkey Vulture, but it never flew very well. I was intrigued by your wing tip feather designs. My design had elevons and was virtually uncontrollable. I can't quite tell from the pictures, but do you have the servo moving the tip feathers? For brevity, that is all I'll ask for now. I live on a major flyway for hawks and have always wanted to use an RC bird to help study migratory bird behavior. With some of the new foam materials and micro radios, maybe I can finally make a decent bird glider. Any suggestions or references appreciated.

Thanks in advance,

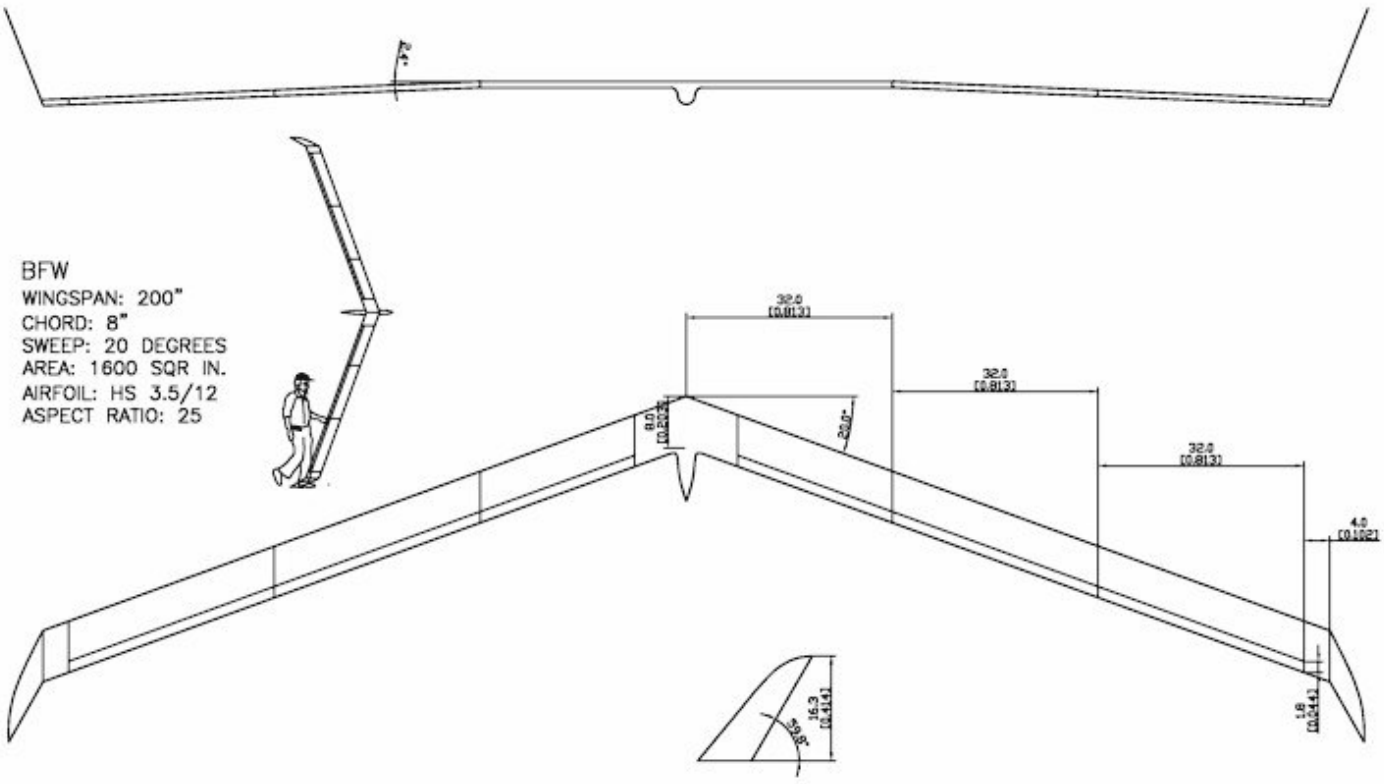
Charley Fager
<CharleyETown@aol.com>

(ed. – We haven't heard back from Bob yet, but I imagine the holidays have something to do with that. I will publish his reply next month.)

December 27, 2007

Just renewed my subscription to the TWITT newsletter, and am looking forward to another year of reading it.

So far over the winter, I have been working on a design for my next flying wing model, and have started construction this past week. I have loosely based the layout of the model on Hartmut Siegmann's "Albatross"



model, but have increased the span and aspect ratio slightly, as well as completely designing the built-up structure for it. Span is 200", chord is 8" and sweep back is 20 degrees. Like the last model I built (see issue #252 June 2007), control will be provided by the six-flap control system, which I found to perform very well on the smaller model. General construction has been beefed up significantly from my smaller model to cope with the higher stresses imposed on such a large wing. This time, I will be using d-box leading edge design as well as capped ribs and large spruce spars. All 110 ribs have been cut on a laser this time for greater accuracy, quicker build time, and lighter weight provided by lighting holes that would have otherwise been too time consuming to cut. I have attached a layout drawing for now, but will get a progress picture or two organized for tomorrow.

Cheers

Chris Doughty
<chris.doughty1@gmail.com>

(ed. – Here is the 3-view Chris included with his message. Looks like a sleek design and will be very fast on the slopes.)

From the Nurflugel Bulletin Board:

December 21, 2007

Still designing as best I can a 3 meter Plank Slope Racer. I have been Googling around and can't seem to find "how to size" the Vert Stab. Any ideas of where? I am aware of final testing to watch upon flying parallel to the slope and watch the Tail, if pushed toward the Slope it's too big or if unstable in Yaw it's too small. But I am sure there is a formula out there to get in the game going in.

Curious Question. When is a Plank no longer a Plank? We all know what a Swept Wing looks like, whether constant or tapered chord. We all know what a Classic Plank looks like, constant chord with a zero sweep or at least very little. Or a single slight taper with either zero sweep, balanced sweep or even a straight TE.

But once we do a multiple taper even if the LE at or near center is zero sweep by the time you get out to the tip, 1/4 chord is now swept. Also common to refer to a design as a Plank with say up to 50% Taper and Straight TE.

So, should I assume it's still a Plank until the TE forms some Sweep or what? I know what "I" call a Plank but wondering if there is a magic limit official Sweep Spot. Or is it a Single Center Vert Stab rather than winglets?

Regards

Dan Field
<danfield@roadrunner.com>

Well, I think I have found what I was looking for in RC Soaring Digest by Peter Wick.

http://www.rcsoaringdigest.com/pdfs/RCSD-2006/RCSD-2006-04.pdf

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December 31, 2007

I write an occasional column for a British aircraft modeling magazine and have noted from previous photo posts that Rudolph Opitz has continued to stay active in soaring or soaring-related activities.

Can anyone tell me how I might contact Mr. Opitz or tell me if he would be able to endure a short interview?

I really don't know where to start but wanted to put this feeler out.

Thank you and Best Regards,

Steve Palmer
Lexington, SC
803-358-2544

You can contact Rudi through the Nutmeg Soaring Club. If you look in the old newsletters you might find an address and phone number for him or his son Marty. http://www.nutmegsoaring.org

Rick Page
<rick-page@shaw.ca>

January 1, 2008

I am rather new to the group. I have read some back posts. Did a search or two, and the last post I found about the Horton H3000 was 2 years ago this December 11th. Then it was reported that the near half scale model was near airworthy and that expectation was the prototype H3000 to be completed by end 2006 or mid 2007. Also the contact of a Dr. Barney Vincelette, whose address is on the Nurflugel site. Is the address for Dr. Barney Vincelette still valid.

Does anyone know of the status of this project or is Horton Aircraft now defunct?

Did the prototype ever get built and if so did it fly? Well? Would appreciate any info you may have.

Tom Jones
<tjonesav8r@sbcglobal.net>

(ed. – Although we don't have any more information than Tom found on the Nurflugel web site, we have received some insight on the PUL9 & PUL10 that led up to the H3000 design. This comes from Ferdi Gale and is included below.)

From Doug Bullard, host of Nurflugel:

From a recent letter from Bernhard Mattelener, he told me that he's recently bought a large house (hotel) and is getting it fixed up. On the H3000 project:

> "I bought a big house at the Lahn river. The house offers enough space for a nice working shop for the flying wing project...
>
> That`s the main reason why the H3000 is developing quite slow. But as soon as the weather is getting better again in spring we are ready to continue our test flights with the 1:2 scale model. The main focus will be to investigate the influence of the canopy. All problems we had in the past were all related to that issue.
>
> The wing itself is not the problem. If we would build a bigger plane without canopy we would have no problem at all (beside a financial one...) Our model is good equipped with all relevant telemetry. The first flights will be without any canopy or better with a very small on just to cover the engine.. Then we will test several canopy versions for side by side and tandem seating. Then we can compare. One will be the H3000 shape which you can see in the picture "H3000
> taking off soon...".
>
> The goal would be to find a canopy with only a minor effect to the aerodynamic, or even better to find a shape for the canopy which generates lift itself. When we have these results we will be able to
> decide how to go on.
>
> I've got some more pictures of the model which I need to add to the page, just haven't got around to it yet."

Go to http://www.horten-aircraft.com/bilder/

There are a lot of .jpg pics of the build and flight.

Jim Sparks
<spider@candw.lc>

From the U-2 Group:

December 13, 2007

Landing Gear Mod Question

I notice the mod for main landing gear is mounted on wood legs and is, I take it, no longer retractable.

What was the reason for this change? Structural defect? More room for prop to earth clearence?

Julius No
<juliusno1776@yahoo.com>

Julius:

There was a lot of discussion in the group a year or two back about the landing gear loads causing delamination of the plywood web of the spar. When I looked at this as a Structural Engineer, I could see that the whole system was deficient in torsion strength, and that the reported delamination was absolutely predictable. We already had the gear mounted and the fuselage truss welded up.

I considered it such an important deficiency that I designed a cantilever gear as shown in the photos (above). I did alternate designs, shooting for a deflection of 1-1/2" under full takeoff weight. The birch gear was lighter than aluminum or Scotchply, plus less expensive and easier to make, so that's what was used. After it was built, we loaded it to gross weight to

check the deflection, then went on to 3 g's to test the strength. It passed all the tests. The wheels are in the same location as on the plans, and the gear now has a little bit of spring.

If I were starting from scratch, I would mount the legs behind the spar and eliminate the sweep, probably saving 3-4 pounds. If you look at the pictures of the last U2 Mitchell built, he had this kind of a gear, and also the same canopy arrangement we are using. I think they referred to this one as the "Victory Wing".

The plans-built gear was designed to allow for retraction, but apparently it was found to be too complicated and did not produce any performance advantage. If you pull the wheels all the way up, they will stick out above the wing. A guy in Germany did it, but reportedly spent tons of money and time. His is the sleek example on all the promotional literature.

Dave Gingerich
<dgingerich@cox.net>

PUL 9, PUL 10….AND BEYOND

By. Ferdinando Gale

These little tailless aeroplanes, based on the original idea by Dr. Reimar Horten, are still considered a good starting point for amateur pleasure aircraft. New designs are being studied by the Horten Aircraft (http://horten-aircraft.com), headed by Bernhard Mattlener. This team of tailless fans includes Germans and Italians as well. The German group is experimenting a two tandem seat prototype, called H-3000, which is equipped with a rear pushing propeller. The first flight was scheduled for the fall of this calendar year; insofar no information has been released. Tailless fans must be patient…

The Italian group is studying another basic design, with the aid of a fully instrumented large size radioguided model. Oscar Carriero, who made the construction/engineering calculations and plans for the PUL 10 built in Italy (Figure 1), has chosen a front installed traction propeller, as well as two side by side seats. Insofar no final decision has been taken. The experience gained with the PUL 9 and the PUL 10 has indicated that the side by side seating is not the best as far as performance and stability are concerned (both longitudinal and directional), as can be seen from the following data:

PUL 9 (one seat)
Installed HP 42
Fixed landing gear
Max speed 225 Km/h

PUL 10 (two seats)
Installed HP 64
Retractable landing gar
Max speed 190 Km/h

During the preparation of the book “TUTTALA HORTEN” (= HORTEN ALL-WINGS), Oscar Carriero, who is a smart aeronautical engineer, has supplied the author with a technical compendium on the PUL 10 (“Compendio sul PUL 10”), which is the source of most information of this writing. Both the PUL 9 and the PUL 10 are based on the aerodynamic design by Reimar Horten, as outlined in Figure 2. Since most readers of this newsletter are not familiar with the Italian language, I am showing here the translation of the relevant terms:

Area semi-ala	*area of semi-wing*
Area elevone	*area of elevon*
Stazione	*station*
Calettamento	*incidence*
Diedro	*dihedral*
Corda parte mobile	*chord of moving part*

All measurements are in metric units.

From the sketch it appears that the overall geometric twist is 11 degrees. Note also the indispensable 20% thick airfoil (original Horten), which equips the wing from station 0 up to station 1240. From this point up to station 3250 the airfoil is linearly interpolated with the NACA 0010. The tip airfoil is then interpolated with the station 3250 airfoil.

The incidence at the root is 1 degree higher, probably in order to minimize the *"mitteneffekt"*, which is far from being a myth. More about this in a future note.

A computer derived bell shaped distribution is shown in Figure 3, while Figure 4 shows a tri-dimensional distribution of the pressure.

Carriero has prepared also a 3-view sketch of the PUL 10 Figure 5: as far as I know, no construction plans are available (and never will be).

Figure 1. PUL 10 during flight tests in Italy.

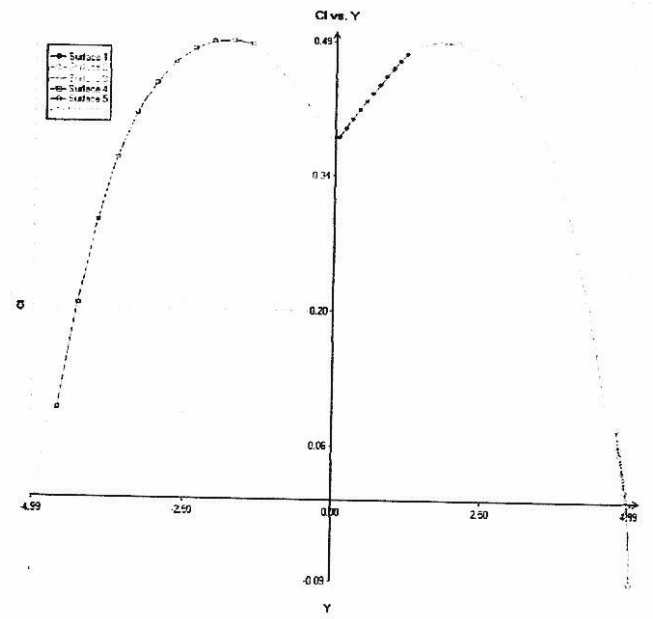
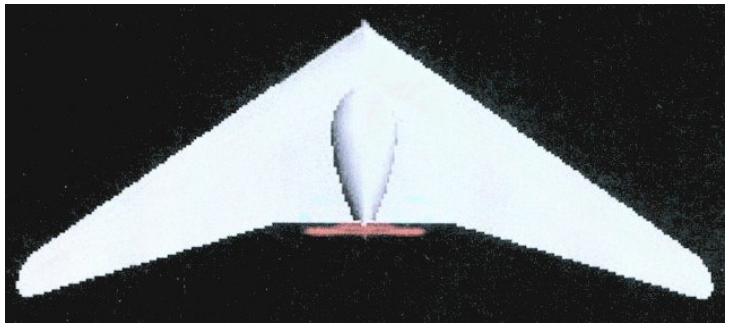
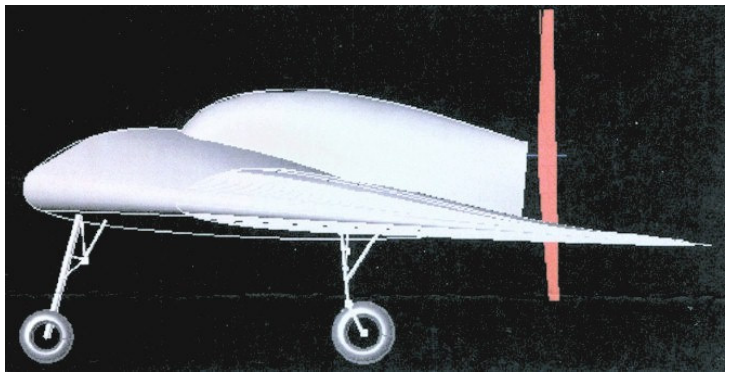
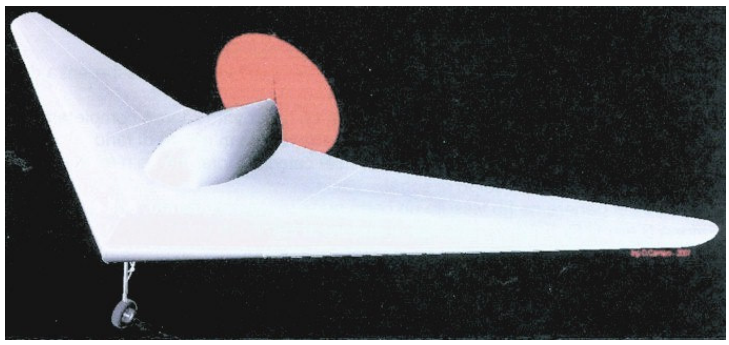


Figure 3. Bell-shaped lift distribution of the PUL 10 (computer derived).

Below: The 3 images that make up Figure 5.







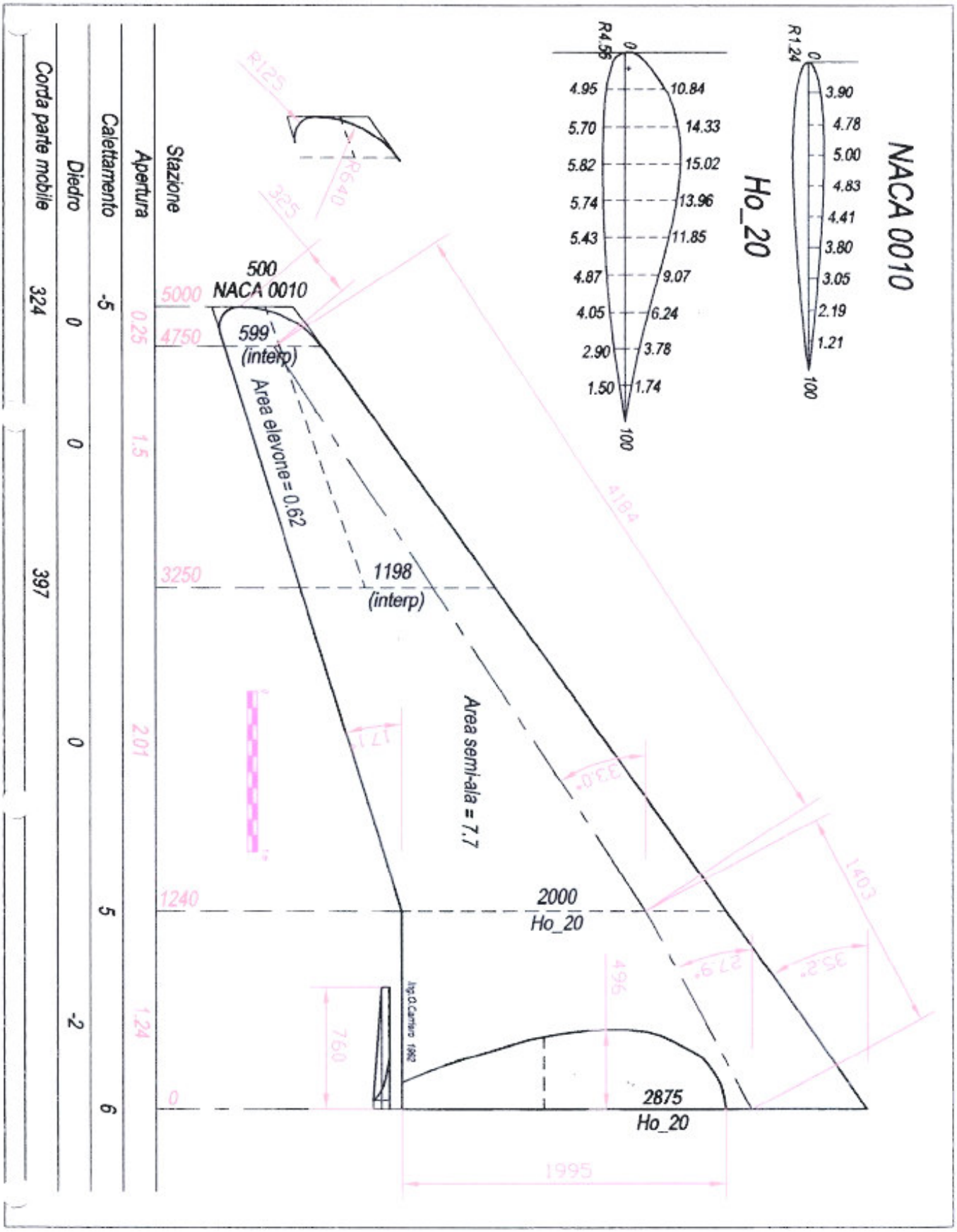


Figure 2. The aerodynamic outline of the PUL 10.

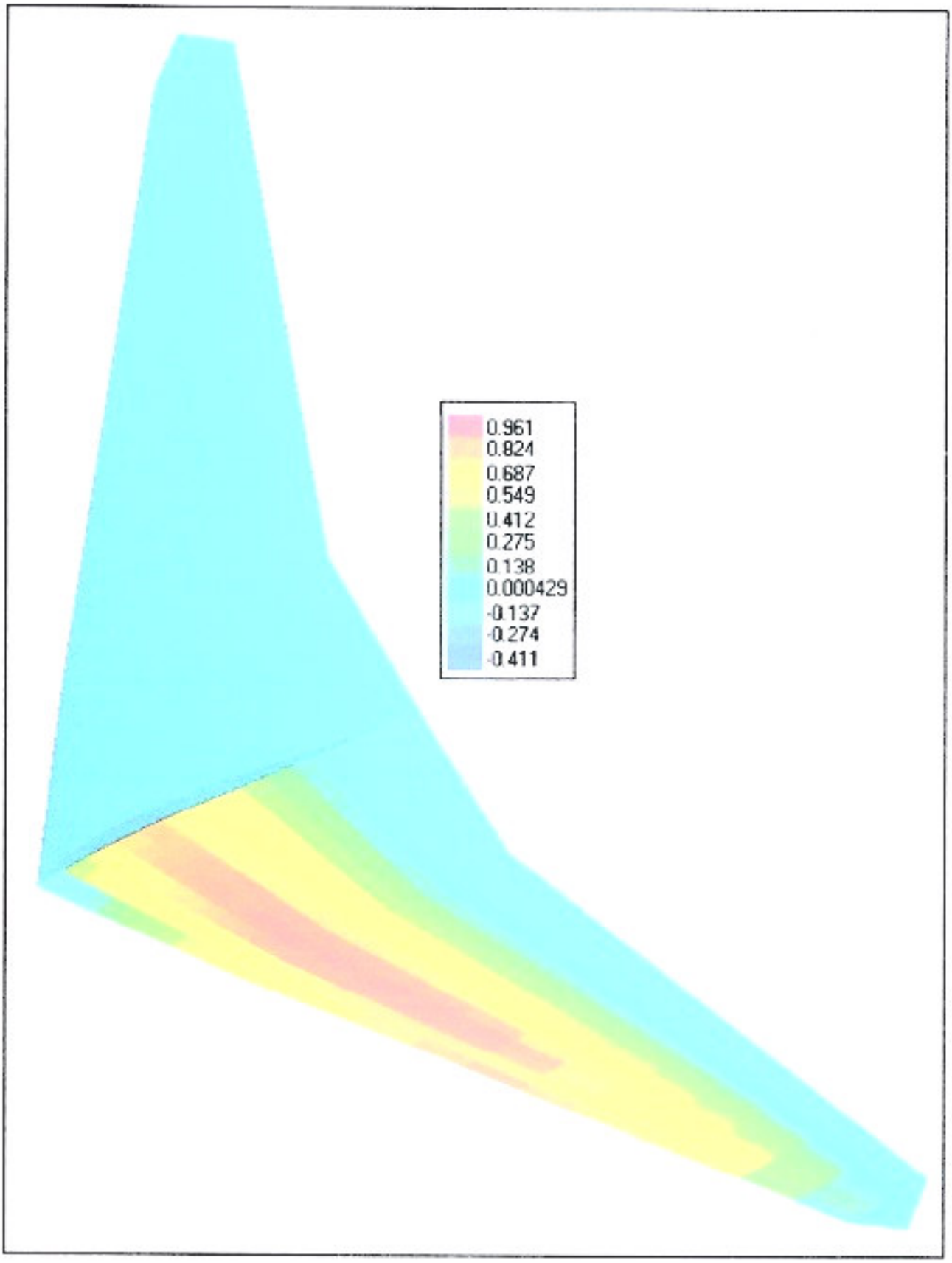


Figure 4. Pressure distribution on the wing of the PUL 10 (computer derived).

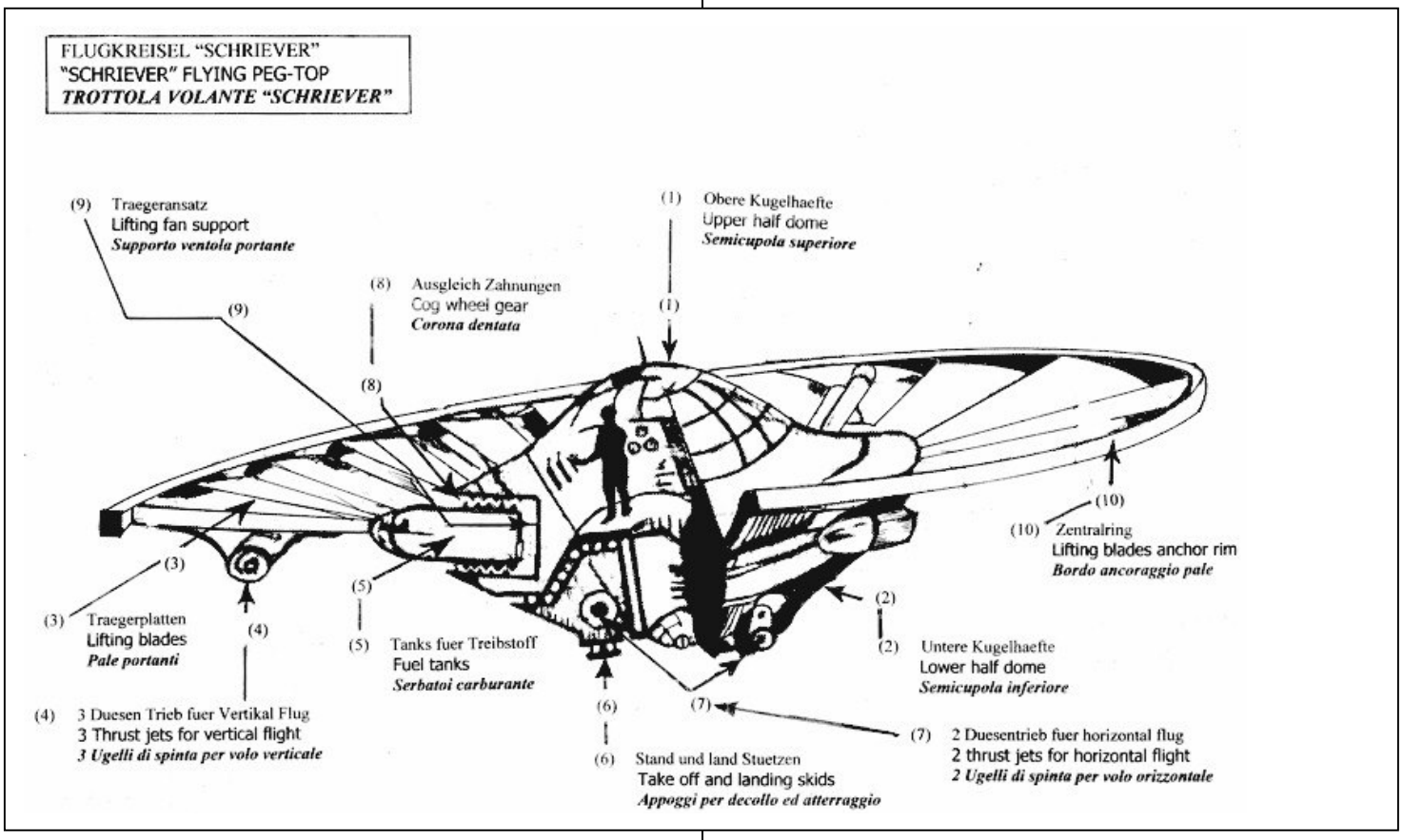
THE FIRST REAL FLYING SAUCER??

Nowaday news regarding flying saucers and UFOs are rather frequent, although nobody has yet been able to look closely at one of them.

Strange as it may appear, one real flying disc flew regularly around 1 June 1942 in Germany. Named FLUG KREISEL (FLYING PEG-TOP), it had been invented by Rudolf Schriever, a Luftwaffe captain and test pilot. Originally equipped with the same turbines as the fighter Heinkel 178, the extravagant UNTERTASSE (as it had been promptly nicknamed) was transferred to the BWM factory near Prague, along with its inventor. After an endless series of mechanical modifications, aimed at eliminating the vibrations, the disc was equipped with BMW turbines, the same used for the first Messerchmitt interceptors.

It flew regularly in October 1944. The climb rate was foreseen at 10 meter/second; after the take off, the saucer remained stationary in the air for a while, that flew horizontally at high speed. Here is what Schriever reported to Luigi Romersa:

> "The speed planned and experienced exceeded the sound speed, due to the minimal drag encountered in its flight path. The UNTERTASSE looked like a monster, a kind of giant octopus, because if the central transparent globe. I climbed into the cockpit and started the turbines. They operated perfectly. When the big paddled crown started its rotation, an air-raid warning was given. I stop the engines and the disc was carried into the hanger. After additional modifications, one week later the FLUG KREISEL took off and flew. The pressure of the enemy was unbearable, since the end of the war was near. The BMW factory stopped its activity, everything was blown up with dynamite, including the disc. The country was already in full revolt and I succeeded with difficulty to reach the Northern Germany".



Nobody knows whether and what the advancing Soviet troops found at the BWM factory.

This information has been taken from the book LE ARMI SEGRETE DI HITLER (HITLER'S SECRET WEAPONS) written by Luigi Romersa, an Italian reporter, protègé of Mussolini and lifetime friend of Wernher Von Braun during and after WW II.

Perhaps all above might be food for thought for keen, inventive modellers.

Ferdi Galè
Baveno VB
ITALY

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
3114 Edgehill Road
Cleveland Hts., OH 44118 (216) 321-5743

Books by Bruce Carmichael:
Personal Aircraft Drag Reduction: $30 pp + $17 postage outside USA: Low drag R&D history, laminar aircraft design, 300 mph on 100 hp.
Ultralight & Light Self Launching Sailplanes: $20 pp: 23 ultralights, 16 lights, 18 sustainer engines, 56 self launch engines, history, safety, prop drag reduction, performance.
Collected Sailplane Articles & Soaring Mishaps: $30 pp: 72 articles incl. 6 misadventures, future predictions, ULSP, dynamic soaring, 20 years SHA workshop.
Collected Aircraft Performance Improvements: $30 pp: 14 articles, 7 lectures, Oshkosh Appraisal, AR-5 and VMAX Probe Drag Analysis, fuselage drag & propeller location studies.

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

VIDEOS AND AUDIO TAPES

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

VHS tape containing First Flights "Flying Wings," Discovery Channel's The Wing Will Fly, and ME-163, SWIFT flight footage, Paragliding, and other miscellaneous items (approximately 3½+ hours of material).
Cost: $8.00 postage paid
Add: $2.00 for foreign postage

VHS tape of Al Bowers' September 19, 1998 presentation on "The Horten H X Series: Ultra Light Flying Wing Sailplanes." The package includes Al's 20 pages of slides so you won't have to squint at the TV screen trying to read what he is explaining. This was an excellent presentation covering Horten history and an analysis of bell and elliptical lift distributions.
Cost: $10.00 postage paid
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

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)

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