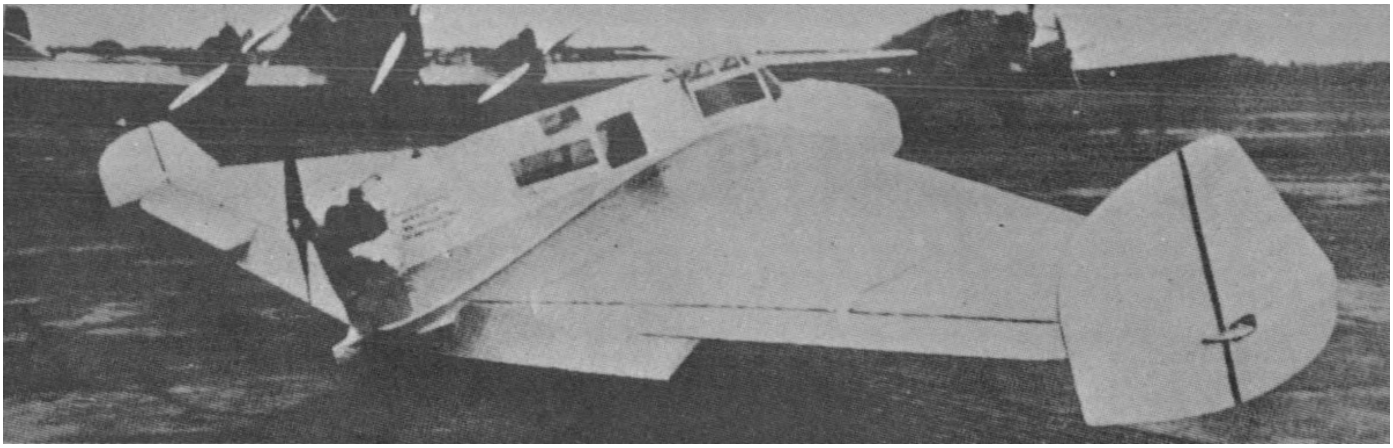
No. 356 FEBRUARY 2016

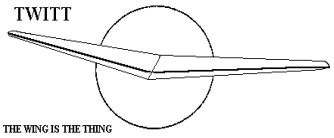
# T.W.I.T.T. NEWSLETTER



This flying wing has probably been on the cover in the past, but this month there is a NACA paper on the Dreieck I airplane reproduced starting on page 3. This is an item from the TWITT archives but you can also find information on the Internet with a quick search.

**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., **1602** means this is your last issue unless renewed.




**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. Officers:

**President: Andy Kecskes (619) 980-9831**
**Treasurer:**
**Editor: Andy Kecskes**
**Archivist: Gavin Slater**

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**TWITT gatherings are held on the third Saturday of every odd numbered month, 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

This is a diverse collection of material this month. I have some links to Al Bower's project on the Prandtl D model wing along with some other links to different Internet sites with similar information.

Then there is the old paper (1931) from NACA on the Dreieck I flying wing that I am sure I have posted photos of over the years without really covering the aircraft's story. This is one of those items I am gradually digging out of the TWITT archives so it is saved in another medium besides paper in a file cabinet.

Then there is a Nurflugel thread and a few Mitchell U-2 threads that I thought would be of interest.

I am glad to report that we have grown by two new members this month, which is great. It means there are still more aviation enthusiasts out there with an interest in flying wings and have found our web site. I hope we will hear more from them as they sift through all the material available in the back issues of the newsletters. This could get some discussions reinvigorated so we all can learn from each other's knowledge and experiences.

## LETTERS TO THE EDITOR

I am a RC helicopter guy, with a little bit of airplane stick time. I worked for the UAV lab on campus during my final semester. Today I work for Google as a software engineer.

I am interested in flying wings after seeing Al Bowers talk about the Prandtl/Horten wing research he has worked on over the past few years. I would like to build such a wing, maybe build several. He indicated that a 19 page paper is due in a month or two; I'm trying to learn as much as I can about wings so that I can understand at least a paragraph or two of the paper.

I look forward to reviewing several past issues, after reading a series about the Prandtl/Horten wing in On The Wing.

Thanks for reaching out,

Jacob Marble
Costa Mesa, CA

*(ed. – Jacob is a new member and I always send out a welcome letter explaining on how to access the back issues on the web site and asking what interest they have in flying wings. We also received payment from another new member, Diederik Thiers, of Sag Harbor, NY. Welcome to both of you and I hope you enjoy the newsletters going forward.*

*While talking about newsletter issues, don't forget the complete set is available on CD for just $8 to cover handling and shipping in the US.)*

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Here is a link to the NASA showing the work being done by Al Bowers' students this year.

Gavin Slater

http://www.nasa.gov/centers/armstrong/news/newsreleases/15-24.html

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The Academy of Model Aeronautics is presenting a video covering the AMA Expo for 2016 - a model aircraft show held recently.

The first installment presents a short interview with Al Bowers that you might find interesting.

See Model Aviation Digital <madigital@modelaircraft.org> for the video and http://www.nasa.gov/centers/dryden/Features/AMA_Expo.html for the details of the project.

Good work Al!

Warren Bean

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Russ Lee and some other worthless guy talking to Stephen Dowling about the -229...

http://www.bbc.com/future/story/20160201-the-wwii-flying-wing-decades-ahead-of-its-time

Al Bowers

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Some time ago, Peep Lauk designed and built a beautiful composite flying wing in Estonia.

I recall seeing video footage of it taxiing, and a still shot or two of it in the air with a horizontal surface added as a canard.

Does anyone know of the fate of this project? It looked to be a work of art.

Kind regards

John

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http://peeplauk.blogspot.com/

Technical data Wingspan 15 m Lenght 3.75 m Height 1.70 m Wingarea 16.8 m2 Empty weight 350 kg Aerofoilsection FX-05-H-126 Engine 2x Solo 210 Min....

David Davidson

**NATIONAL ADVISORY COMMITTEE FOR AERONAUTICS**

**AIRCRAFT CIRCULAR No. 159**

**THE DREIECK I TAILLESS AIRPLANE (GERMAN)***

On the investigation Dr. Hermann Kőhl, the successful German ocean flyer, Mr. Lippisch, the chief engineer of the Rhon-Rossitten Association, and his staff have developed a tailless airplane, which has so far shown excellent flying qualities. It was recently demonstrated at Berlin-Tempelhof airport before a party of prominent people interested in aviation and representatives of the press. (Figs. 1, 2, 3, 4,5.) Dr. Hermann Kőhl, as he said in a speech, sees in the development of this type of airplane the present most promising step towards achieving more economical airplanes, capable of profitable long-distance transport work across oceans and continents. He is personally interested in the early perfection of such airplanes, with which, as we know from other sources, he plans inaugurating a regular transport service between Europe and America.

From the performance of the first trial airplane it would appear that the new type promises well for the future. It was first built as a glider, which was successfully flown at the Rhőn, and the experience there gained was such as to encourage altering the design into the present engine-driven airplane. In the glider the body was situated below the wing. It has now been built into the latter, with its top protruding above it, while the lower wing surface is flush. The wing is of the cantilever type, with a pronounced lateral dihedral angle. It has been constructed entirely of wood, with plywood leading edge and fabric covering. For this size of airplane the wing has an unusually deep section, and its plan contours are those of an isosceles triangle, with a very obtuse apex angle forming the front, while the long base line constitutes the trailing edge. The fuselage projects in front and contains two, seats arranged one behind the other, the front one being equipped with the usual type of control's.

*From Flight, October 9, 1931.

From the rear seat one, has practically no view of the ground, as one is situated in the center of the wing. An old Bristol "Cherub" engine of 30 hp maximum output, presented by Mr. Croneiss, the managing director of the Deutsche Verkehrsflug Company (the second largest German air transport company), is fitted at the rear end of the fuselage, and drives a metal two-blade pusher propeller. The cockpits are covered by hinged hoods with wooden frames and cellon panes, some of which, at the side, are slidable.

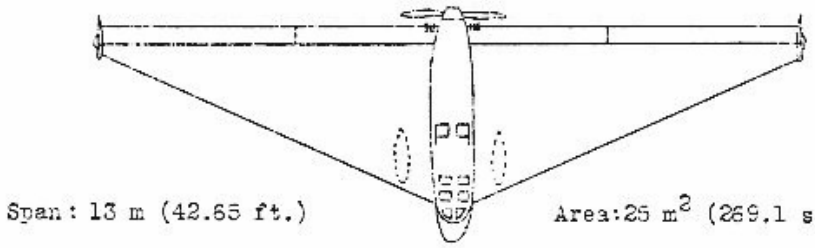
The trailing edge of the wing on each side is formed by two ailerons, the inner set serving as elevators. The rudder fins are located on top of the wing tips, and have no lateral supporting struts, which are entirely avoided in the whole airplane, giving it a realy neat appearance and ensuring good aerodynamic qualities. While the fins and the attached rudders have a flat surface facing outward, the inward surface facing toward the fuselage has a pronounced camber. The two rudders work independently, as their manner of operation is different from that of rudders on normal airplanes. The left rudder is solely connected with the left and the other with the right pedal, and when the airplane is required to make, say, a left hand turn, only the left pedal is moved, while the right remains stationary, and vice versa. Br depressing the pedal the corresponding rudder is swung out and the air resistance thus caused retards the motion of the wing tip, while the other wing tip swings round unobstructed, so the airplane makes the required turn. If both rudders were to be depressed together, it would merely reduce the airplane's speed without causing it to turn.

The landing gear consists of three independent wheels with low-pressure tires. The two wheels under the wing, one each side of the fuselage, are enclosed in a streamlined casing secured to the wing, inside of which rubber cord shock absorbers are located. These are visible through cellon panes let into the top of the wing for inspection purposes, Similar inspection windows are provided at all points where the control cables run over pulleys. The small front wheel is likewise encased, the casing forming a continuation of a perpendicular fin suspended from the front end of the fuselage. The wheel casing, with the wheel, can be steered by means of a tiller in the cockpit, which, however„ is only used for, maneuvering on the ground.

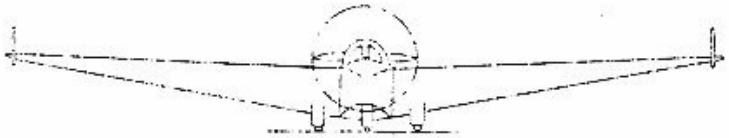
In the hands of the pilot Groenhoff, the airplane showed a surprising degree of maneuverability. Groenhoff said the airplane steers very lightly, and he can do anything with it which he can do with any good normal airplane, including looping. The latter were, however, not shown at the demonstration. The airplane flew very close circles and zoomed up in a manner that would appear to indicate its having plenty of reserve power. It seemed practically nonstallable.

N.A.C.A. Aircraft Circular No.159 Fig.1

(Taken from Revista Aeronautica with modifications)



Span: 13 m (42.65 ft.) Area:25 $m^2$ (269.1 sq.ft.)



Bristol
"Cherub"III
30 hp
engine

Fig.1 General arrangement drawings of the Dreieck I tailless airplane.

**CHARACTERISTICS AND PERFORMANCE**

| | | |
|---|---|---|
| Span | 13.0 m | 42.65 ft. |
| Wing area | 25 m2 | 269.1 sq,ft. |
| Weight empty | 320 kg | 705.48 lb. |
| Flying weight | 520 kg | 1146.40 lb. |
| Wing loading | 20.8 kg/$m^2$ | 4.25 lb./sq,ft. |
| Power loading | 17.87 kg/hp | 39.4 lb./hp |
| Maximum speed | 155 km/h | 96.31 mi./hr. |
| Cruising speed | 140 km/h | 86.99 mi./hr |
| Highest altitude | 4700 m | 15420 ft. |

N.A.C.A. Aircraft Circular No. 159 Figs. 2,3,4,5

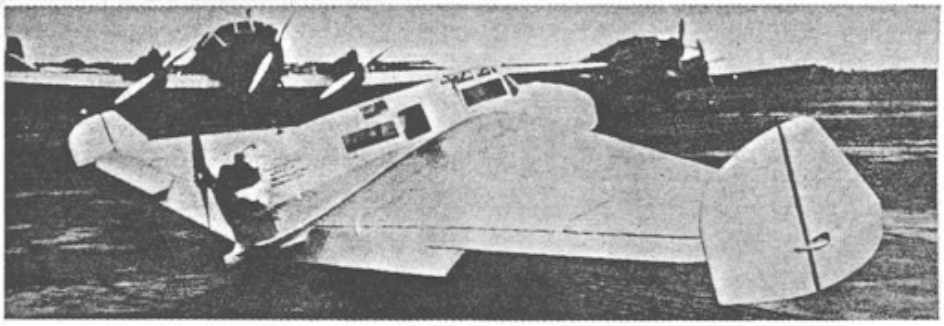
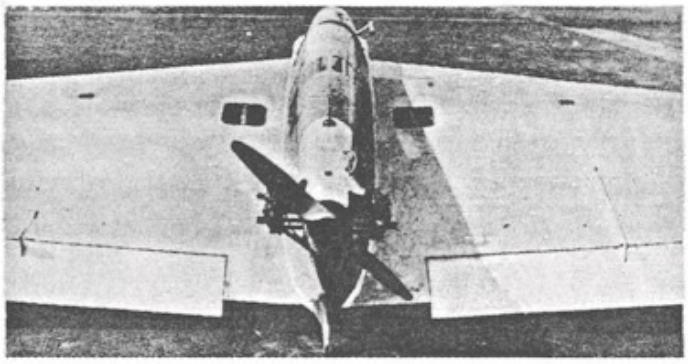


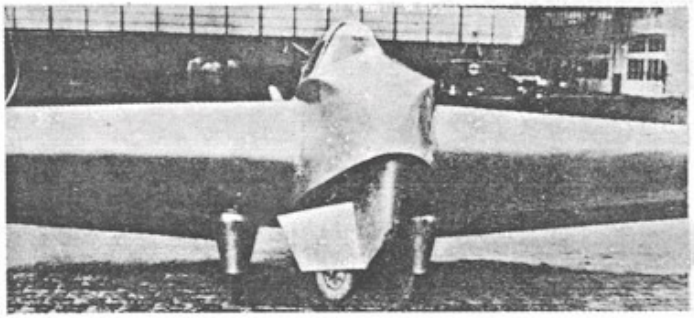
Fig. 2 Three-quarter view of the Dreieck I airplane showing ailerons and wing-tip rudders.



*Figs. 2, 3, 4 From "Aircraft Engineering"*

Fig. 3 The Bristol Cherub engine and pusher propeller.

Fig. 4 Front view showing the swivelling steering wheel.



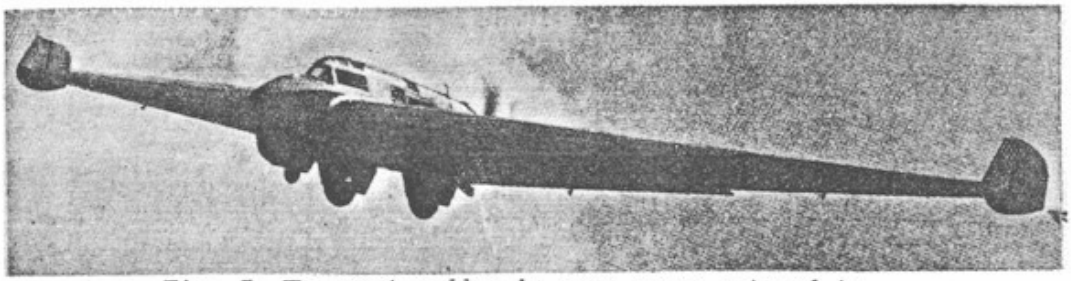


Fig. 5 The port rudder is seen swung outward to make the airplane steer to the left. *From "Flight."*

## Nurflugel Threads

There were the MX-334 (glider) and the MX-324 (rocket airplane). The mistake was first generated in a book about Northrop from the 1980s and was pointed out to me to by Northrop historian Ira Chart. I published the detailed history of the MX-334, MX-324 and XP-79B in late 1995 and I hope to republish it soon. My book included the unique complete flight log of the project.

For info, visit:
http://www.luft46.com/hpmpub/hpmpub.html

Henry Matthews
HPM Publications

*(ed. – Here is another link provided by Bob Storck.)*

http://www.aerotechnews.com/blog/2016/01/22/high-desert-hangar-stories-with-bob-alvis-4/

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## U-2 Threads

I am Rémi, a French scale modeler. I have chosen the Wolfgang Uhl's U-2 wing for my next project, so I am gathering as much documentation as possible about this plane.

I do know that the pod and landing are non-standard, but I have managed to find enough pictures to reproduce them accurately enough.

What bugs me a little bit is that all 3 view drawings available on the Internet seem pretty far-off as far as the wing lay-out is concerned.

I have tried to contact
http://home.earthlink.net/~mitchellwing/
http://home.earthlink.net/~mitchellwing/ but to no avail...

So I would like to know if someone would be kind enough to send me (or tell me who to contact/ where to look for) the general drawing of the U-2 from the plans pack.

Best regards from France,

Rémi

Remi, Cannot help you with drawings, but am interested in your project. I had been thinking to build a model of the u2 at 1/3 scale with an electric motor. Please let us know how your project progresses.

Thank you.

Curt

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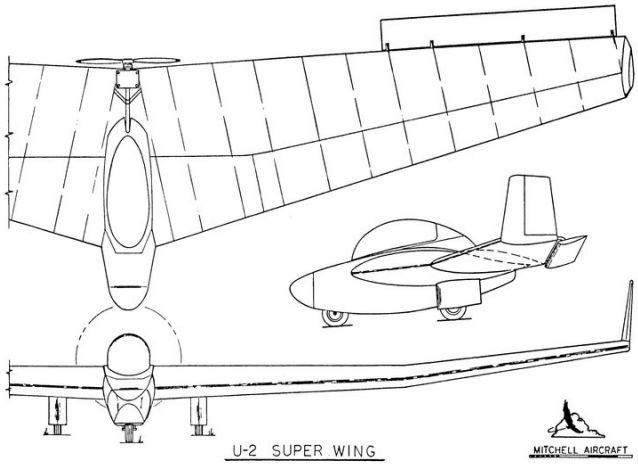
I have sent the attached U-2 3 View to Remi. This is a true scale drawing I made using the plans & parts that were in my kit.
I have moved from Mesa, Az to Fresno, California.

Stan

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Curt : I am a static scale modeler, so I am afraid my wing would need an hefty motor to take off ! I plan to build the wing from scratch, and the Mitchell wing is a fine, suitable subject for that : simple lines, yet many little things to detail (engine, cockpit, landing gear…), and reasonable dimensions at 1/32 scale (31cm span, 8.5cm length) or 1/48 (21x 5.7 cm).

Stan : A big thank you, this is exactly what I was looking for! The correct dimensions and all the important things (airfoils)! Perfect!

Best regards from Lyon, France

Rémi

## AVAILABLE PLANS & REFERENCE MATERIAL

### Tailless Aircraft Bibliography

My book containing several thousand annotated entries and appendices listing well over three hundred tailless designers/creators and their aircraft is no longer in print. I expect *eventually* to make available on disc a fairly comprehensive annotated and perhaps illustrated listing of pre-21st century tailless and related-interest aircraft documents in PDF format. Meanwhile, I will continue to provide information from my files to serious researchers. I'm sorry for the continuing delay, but life happens.

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

### 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

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**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

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**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

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**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

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**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

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**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 $250 US delivery, $280 foreign delivery, postage paid.

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San Bruno, CA 93725 http://home.earthlink.net/~mitchellwing/

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