

No. 390

FEBRUARY 2019

T.W.I.T.T. NEWSLETTER



A NEW TAILLESS AIRCRAFT: Herr Lippisch, chief designer of the Rhon-Rossitten Ges., has produced this new tailless aircraft at the Wasserkuppe. After considerable trials as a glider it was fitted with a Siemens engine and has now been taken by Herr Koehl, of trans-Atlantic fame, to Berlin. It is exceptionally clean and highly efficient as one would expect from the designer of the world's most successful gliders such as the Wien and the Fafnir.

Source.

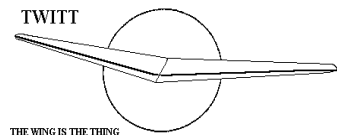
<http://aviadejavu.ru/Site/Crafts/Craft21424.htm>

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., **1902** 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. 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) 980-9831
- Treasurer:**
- Editor: Andy Kecskes**
- Archivist: Gavin Slater**

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

E-Mail: twitt@pobox.com
Internet: <http://www.twitt.org>
 Members only section: ID – 20issues10
 Password – twittmbr

Subscription Rates: \$20 per year (US)
 \$30 per year (Foreign)
 \$23 per year US electronic
 \$33 per year foreign electronic

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

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

Foreign mailings: \$0.75 each plus postage

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

PERMISSION IS GRANTED to reproduce this publication or any portion thereof, provided credit is given to the author, publisher & TWITT. If an author disapproves of reproduction, so state in your article.

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).

TABLE OF CONTENTS

President's Corner 1
Letters to the Editor 2
Flying Wing Pictures 4
Available Plans/Reference Material..... 7



PRESIDENT'S CORNER

This is kind of a strangely formatted issue based on the material I had available. The copies of pages provided by Larry Nicholson got finished this time around which meant I was out of stuff to publish.

I then found a piece sent in by Donald Cook that came in the mail in October that got set aside then overlooked. The article was from a 1980 book so I didn't feel comfortable in scanning it then putting it in the newsletter. So the compromise was to find public domain versions of the articles' pictures then add the associated caption so you can get an idea of the material. The entire book is available on Amazon for \$5 or less so you can read the whole thing if your interest is peaked.

That's it for this month.



LETTERS TO THE EDITOR

The following information came to me in March from Larry Nicholson and I set it aside for a future issue then forgot I it. This is the last of the reproductions he sent along.

The source for this last pages is: Wood, Karl, Technical Aerodynamics, New York & London: McGraw-Hill Book Company, 1935, pp 172-182.

(e. - My thanks to Larry for passing this along to the membership for improving their knowledge of aircraft design.)

ART. 8:10] LATERAL AND DIRECTIONAL STABILITY 181

11. With accurate observations on the spin of a given airplane, mathematics may indicate the most promising changes in the airplane to favorably alter the spinning characteristics.

12. The effects of center-of-gravity location and longitudinal distribution that have been noted in most spinning experiments have been primarily due to increased wing loading, the change in center-of-gravity position usually being accomplished by additional load aft. The change in radius of gyration due to these added weights has usually been negligible in that the moment of inertia has not increased faster than the weight.

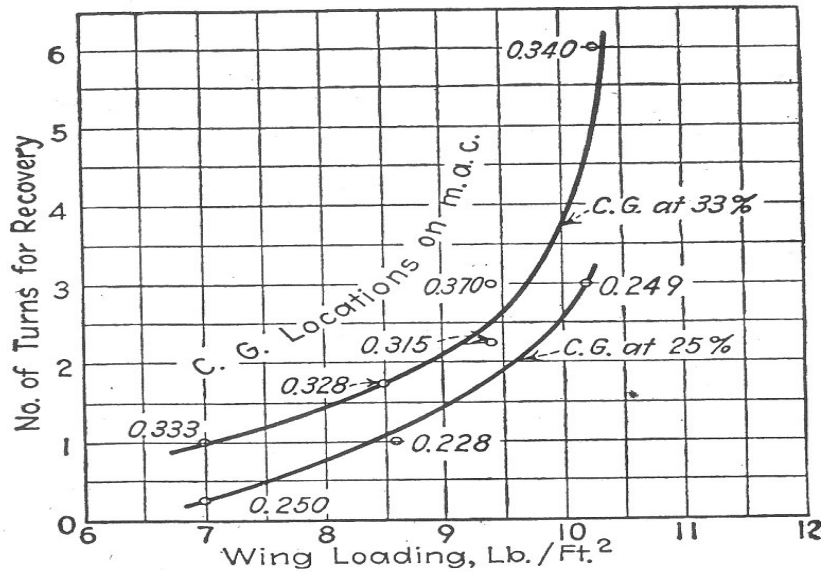


FIG. 161.—Recovery from a spin as a function of wing loading. (From J. M. Gwinn.)

For further study of spins, the following references are suggested:

1. NACA Rept. 456, The Aerodynamic Forces and Moments Exerted on a Spinning Model of the "NY-1" Airplane as Measured by the Spinning Balance.
2. KNIGHT, MONTGOMERY, Wind Tunnel Tests on Autorotation and the "Flat Spin," NACA Rept. 273.
3. HOVGARD, PAUL E., Spinning Experiments, SAE. Jour., November, 1930.
4. SUTTON, HARRY A., Airplane Tail-Spins Analyzed, SAE. Jour., November, 1930.

8:10. Estimation of Aileron Size.—Ailerons of normal effectiveness below the stall are obtained if the proportions indicated in Fig. 156 (broken line) are used. Diehl recommends 20 to 25

per cent chord ailerons with spans to correspond as in Fig. 156 and a permissible variation of ± 10 per cent of the specified values. This rule gives ailerons of area S_a equal to 8 to 10 per cent of the wing area. If lateral control beyond the stall is not desired, ailerons of this size will usually be satisfactory.

If lateral control beyond the stall is desired (this is necessary if it is desired to land from a stalled glide), it is probably desirable to use shorter and wider ailerons combined with some form of spoiler or spoiler slot. Adequate data are not available for determining the minimum size of such ailerons, but for preliminary design 10 per cent of the wing area should be sufficient, perhaps $0.05S$ (15 per cent chord, 33 per cent span) if the type shown in Fig. 151*b* (A) is contemplated. The most useful choice of flap type, spoiler type, and sizes of both is probably a matter of economics and cost accounting.¹

8:11. Problem.

1. Scale the drawing of the Aeronca airplane (Fig. 66), and determine whether the ailerons are large enough to give the conventional amount of lateral control below the stall.

¹ See K. D. Wood, "Airplane Design," Chap. 6.

The following series of pictures and accompanying text represent or are exactly the same as those shown in the book Incredible Flying Machines by Michael Jerram published in 1980. I am doing it

this way since the pictures are available on the Internet but will give you an idea of what is covered in his Chapter 5 titled ...But No Tails. You can order the whole book through Amazon for \$5 or less so it is reasonable just to get this chapter.



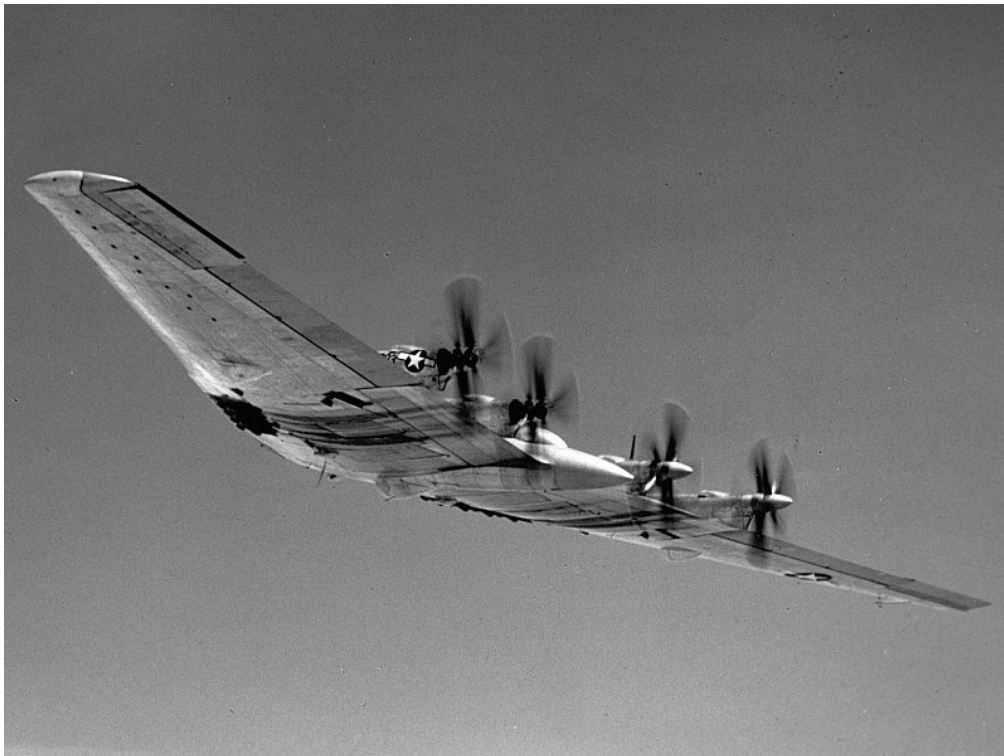
The compactness of tailless designs is clearly seen on the somewhat ungainly Waterman "Whatsit" experimental light plane.



The ultimate expression of the flying wing concept is perhaps to be found in the Northrop XB-49 jet bomber project. Yet again, though, the promise of the type seemed to be too good to be true, and it was cancelled, despite the clear advantages of the flying wing in terms of low drag and low structure weight.



The aerodynamic benefits of a tailless layout can be seen in the Armstrong Whitworth AW.52G test glider.



The huge Northrop XB-35 flying wing bomber, which first flew in June 1946, brought a new dimension to the concept of heavy bombing. The aerodynamic cleanliness of the aircraft had important performance benefits, while the elimination of non-contributory portions such as the fuselage and tailplane allowed a higher proportion of the total weight to consist of payload. In the event, however, the manufacturers of more of more conventional aircraft capitalized on the conservatism of US air force commanders to ensure that the XB-35 did not advance beyond the prototype stage.



The Westland Pterodactyl I, built to the designs of Geoffrey Hill, did much to convince the aeronautical world of the practicality of tailless aircraft. This aircraft of the mid-1920s was notable for its swept wings, with control effected by moving wingtips. These latter could be moved in concert to act as elevators, or differentially to act as ailerons.



The Messerschmitt Me-163B was aerodynamically successful, its failings resulting from the need to rely on a liquid-propellant rocket motor for propulsion. This Walter motor burned fuel at a voracious rate, but any shock to the small quantities of fuel left in the tanks after a flight could lead to detonation and inevitable destruction of the aircraft and pilot.

**AVAILABLE PLANS &
REFERENCE MATERIAL**



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.

U.S. Pacific (559) 834-9107
8104 S. Cherry Avenue mitchellwing@earthlink.net
San Bruno, CA 93725 http://home.earthlink.net/~mitchellwing/

**COMPANION AVIATION
PUBLICATIONS**



EXPERIMENTAL SOARING ASSOCIATION

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)

United States \$20 /yr
Canada (Air Mail) \$25 /yr
All Other Countries (Air Mail) \$35 /yr
Electronic \$10 /yr
U.S. Students Free if full time student as defined by SSA)

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