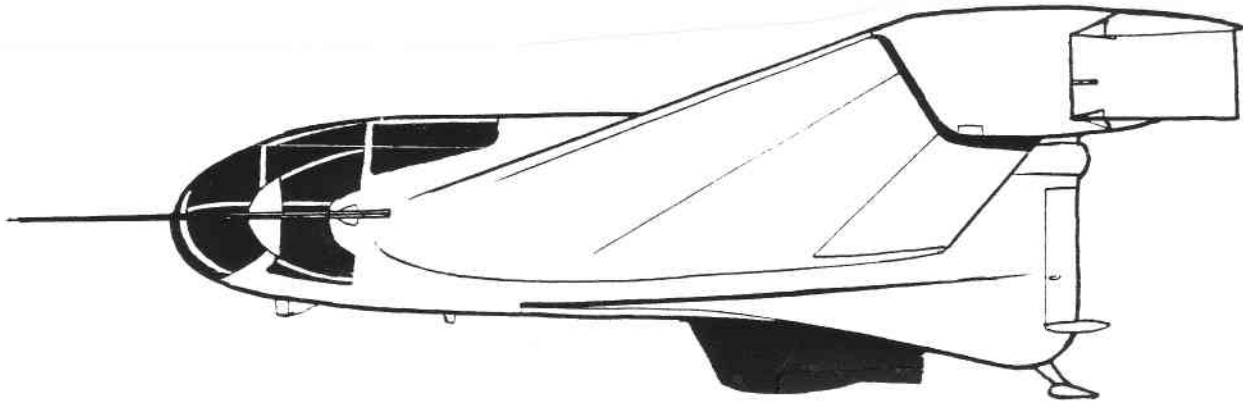


T.W.I.T.T. NEWSLETTER

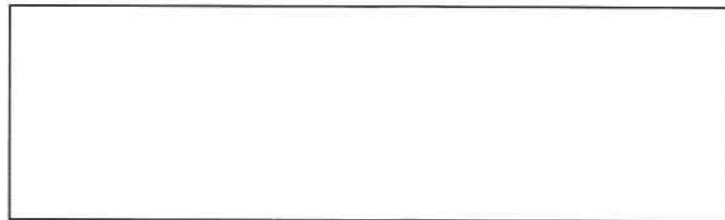


DFS 40

ABOVE: A piston-engined version of the DFS 40, with a 31'6" wing span, two seats and delta wings, was first built in 1938. The rocket version was to be built later the same year as a special medium-speed testbed with retractable undercarriage. But it was dropped before it could be completed, in favor of the DFS 194. The 194 was ME-163 look alike the Lippisch's team started as a piston engine aircraft, but when they came under Messerschmitt's umbrella in 1939, work started converting it rocket power also.

T.W.I.T.T.

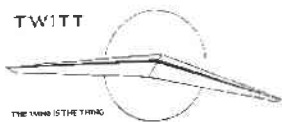
The Wing Is The Thing
P.O. Box 20430
El Cajon, CA 92021



The number to the right of your name indicates the last issue of your current subscription, e.g., **9505** means this is your last issue unless renewed.

Next TWITT meeting: Saturday, May 20, 1995, beginning at 1330 hrs at hanger A-4, Gillespie Field, El Cajon, CA (first hanger row on Joe Crosson Drive - East side of Gillespie).

TWITT



**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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Editor: Andy Kecskes

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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



Well, I'm glad that we have some special announcements for you this month. Please take a look at them on the next page. I know many of you have been waiting a long time for these events.

I have also published the 1994 financial statements showing our condition as of December 31. Even though it looks relatively good, the coming year is proofing to be costly due to the library and index projects, along with a full year's rent on the space needed to keep all of TWITT's assets. I will do another analysis at mid-year to determine how well we are doing and let you know.

This month's program features Bruce Carmichael, and we are hoping to get Jack Norris to talk with us about his Zero Thrust Glide Test procedures for performance evaluation. He has articles in the March and April issues of Sport Aviation on this subject for those of you who may not be able to make his presentation. The September program, with his consent, may be Phil Barnes who will explain a little more about his theory of describing airfoils with equations.

Some upcoming events include the Carl Hatrak's Annual Flying Wing Contest at Taft, CA, on May 27; the Vintage Sailplane Association's Memorial Day Meet at Hemet-Ryan Field in Hemet, CA over the holiday weekend, and; the vintage sailplane get together at Harris Hill, NY in July (see announcement in this issue for more details).

Recently the mail has been trailing off from you guys. I can't believe we have gotten all your questions answered or that you are not planning or building anything. Please keep us informed of your projects and ask those hard questions. It is the only way to create the flow of information and get more people thinking of new ways to solve previously unknown problems. That's what TWITT is all about, but we need your help, both by asking and answering questions on flying wing theory and construction.

MAY 20, 1995 PROGRAM

The program this month should prove to be a special one. We will be privileged to hear **Bruce Carmichael** give us a preview of his upcoming presentation to the EAA Convention in Oshkosh titled Laminar Aircraft Odyssey - 1883 to 1995. Bruce has been a long time member of TWITT and has contributed copies and some originals of much of his early work and what he has collected on flying wings over the years.

His talk is a historical review of the various pieces of theory and experimental proof that have led to significantly improved performance of aircraft. The emphasis will be upon extending the amount of laminar flow on aircraft surfaces. Thirteen remarkable aircraft, developed in the years 1950 to the present, will be described in terms of their aerodynamic refinement. Methods now available to further refine prototypes in flight test will be covered. Some unconventional design features allowing maximum attainment of natural laminar flow will be presented. The design, fabrication and operational requirements to capitalize on these gains will also be covered.

As you can see, this is a program that everyone can certainly get a lot of useful information from. I'm sure that some of the things he will cover are going to create new questions and Bruce has the knowledge to probably give you a reasonable answer. So don't miss this one if you're interested in learning more about aircraft design theory.

HOT OFF THE PRESS

We have two exciting announcements that we know everyone has been waiting to hear about.

FIRST: One of our newest members, Joel Hirtle of Westerville, Ohio, has volunteered to put together a complete index of the material contained in all the past issues of the newsletter. He will be using software which will allow us to cross-reference the articles and illustrations several different ways so everyone will be able to pick out just what issues have their favorite things.

This has been a long time in coming, and I want to be the first to thank Joel for taking on this project. It sounds like he has the equipment, knowledge and skills to do a bang up job, and we are looking forward to finally providing our members with this important information.

SECOND: Two other of our members, Craig and Nancy Roberts of San Diego, CA who have recently renewed their membership, have taken on the task of cataloging the TWITT library.

This is a monumental project since it involves pulling together nine years worth of accumulated material all of which is not quite well organized.

I upgraded the TWITT computer using the spare parts from the recent upgrade of my computer. This will give them plenty of storage space for the material and allow of future growth.

We don't have any expected completion dates, but I am confident that it won't be too many more months before we can offer these items to the membership.

So now for the pitch - all of this is taking money from the treasury to provide the equipment and back issues necessary to complete the projects. Although it won't break us, it does cut into what little bit of reserve we had managed to build up in the past year or so (see the financial statement below).

THEREFORE: For everyone who will contribute at least \$10 toward the production of the library bibliography we will send you the inaugural issue free of charge (the amount of which we don't currently know).

For everyone who will contribute at least \$5 toward the production of the newsletter index we will send you the inaugural issue free of charge (don't know the future price of this one either).

Any donations over and above what it takes to cover the initial expenses will be set aside to cover the on-going maintenance of these two vital documents. Hopefully, this will ensure we can collate and produce at least semi-annual updates which would be mailed to all current holders.

If you decide to contribute, please make sure to mark your check, or indicated in your letter, which item the money is for so we can keep accurate records for the initial mailings, and for tracking future funds availability.

This is some of the best news we have had for the organization in a long time. At last we can see these two projects being completed and the membership provided with what they have been asking for over the years.

I want to personally thank Joel, Craig and Nancy for taking these tasks on. As new members they have jumped into TWITT with both feet running, and I know we are all grateful for their efforts.

=====

We are pleased to announce that William Foshag will be presenting a complete set of TWITT Newsletter back issues to the Library of Congress during the month of August. These will then become available to a very wide range of people who utilize the library for research and information.

We would like to thank William for arranging this presentation along with another one he is planning for some other published material. It will ensure that the existence of TWITT in the form of its written word will endure long

after the organization ceases to function. We will provide the library with a bundle of new newsletters every couple of years so it will remain relatively current.

FINANCIAL DATA

BALANCE SHEET (12/31/94)

Current Assets	
Cash	\$ 1,028.11
Acct. Recvble.	224.00
Inventory	<u>253.32</u>
Total Current Assets	1,505.43
Fixed Assets	
Material & Equip.	<u>2,174.50</u>
TOTAL ASSETS	\$ <u>3,679.93</u>
Liabilities	
Acct. Payable	\$ 2,040.75
Equity	<u>1,639.18</u>
TOTAL LIABILITIES & EQUITY	\$ <u>3,679.93</u>

INCOME STATEMENT (12/31/94)

Membership Dues	\$ 2,026.50
Raffle Tickets	56.00
Information Packs	25.50
Donations	50.60
Miscellaneous	<u>945.70</u>
TOTAL INCOME	3,104.30
Less:	
Newsletter Expense	1,237.82
Mailing Expense	814.08
Raffle Expense	68.40
Miscellaneous Expense	<u>797.45</u>
TOTAL EXPENSES	(2,917.75)
NET INCOME	\$ <u>186.55</u>

NOTE: As you can see we came out ahead in 1994, however, the miscellaneous expense category will increase by about another \$180 as we continue to pay for storage space in the hangers for all the equipment, library, etc. Obviously, mailing expense is also going up with the introduction of the 32¢ stamp for first class postage. As of this time we don't anticipate raising the subscription rate for either domestic or foreign members.

Don't forget, any donations you make, including your subscription, are tax deductible under the auspices of the Hunsaker Foundation. If you would like a receipt, let us know and we will send you one for your tax records.

If you have any questions about the financial statements, please give me a call or drop me a letter and I will be glad to answer them.

BIRDS OF A FEATHER...

(ed. - The following article was contributed by our Secretary, Phillip Burgers, at the request of Bob Fronius, our Treasurer, after a rousing session of feeding the sea gulls on New Year's Day at a local (San Diego) shoreline. The antics of the gulls while trying to catch bread tossed into the air fired a debate on how they used their tail feathers as flight controls. This is Phillip's answer to Bob's challenge. Read and enjoy.)

DOES A BIRD HAVE A TAIL TO TELL ...???

by Phillip Burgers

Has a bird a tail or not???

Many of the readers may ask themselves if this question has any relevance to the goals of TWITT. Even though this following discussion seems academic or superfluous, I personally think that birds, together with bats, are the most sophisticated flying wings in existence today. What follows is a justification of this statement. This article is dedicated to those interested in flying wings, to Karl Sanders and to Bob Fronius, who were dear friends of mine...until they read the lines that follow. They started it all.....!!!

Lets define what we understand as a tail in an airplane.

The tail of an airplane is defined as a surface, be it vertical or horizontal, at the end of the aircraft's fuselage which supplies the following conditions for flight:

i) directional stability by means of a vertical surface.

ii) pitch control, longitudinal trimming and stability by means of a horizontal surface.

Lets analyze each of the aforementioned functions of a tail and compare them with birds.

i) directional stability by means of the vertical surface: this is an easy one...a bird does not have a vertical tail. In birds, directional stability can be obtained by variable washout/washin of the outer part of the wing (as observed and entered by Wilbur Wright in his diaries in 1900) and at low speeds is being accomplished by the feathers attached at the end of its body. These feathers turn up to be actually low speed ailerons.

ii) pitch control, longitudinal trimming and stability during bird flight is not done by the tail, as in airplanes were there is a download on the tail. This primitive way of obtaining stability that we still use in our airplanes penalizes the aerodynamic efficiency during flight. The bird's pitch control and trimming is more sophisticated: it is done by adjusting the relative position of the aerodynamic center of the wing with respect to the center of gravity of the bird. At low

speeds, the bird places the center of gravity backwards with respect to the aerodynamic center of the wing so the back feathers (don't call it a tail yet!!) act as a secondary lifting surface that lifts a small percentage of the bird's weight and in so doing it unloads the main wing.

So the obvious question arises: What does the bird's tail do? The main function of the tail is to unload the main wing at high angles of attack, and in so doing it delays its stall. It does so by sweeping the wing forward, moving the center of gravity backwards relative to the main wing and "fanning out" its aft feathers to increase its secondary lifting area. This aft lifting surface area is exactly opposite to a canard surface: it is located behind of the main wing and has a low loading while the canard is placed forward of the main wing and highly loaded.

When the bird is at very high angles of attack, the tail is right behind the main wing and immersed in the downwash of the main wing. This is not a problem for the end feathers due to the fact that they form a low aspect ratio surface that makes it immune to the sudden changes in downwash of the wing. A high aspect ratio secondary lifting surface behind the main wing would stall with a small change in downwash induced by the main wing.

It is apparent at this point that the so called "tail" does act not only as a low speed aileron but also as a flap. The other large function of this flap is to increase the lift of the main wing by creating an upwash in front of the wing.

A DIFFERENT APPROACH TO THE "BIRD DON'T HAVE NO TAIL" APPROACH

Even biologically speaking, the bird lacks a tail. Bats don't have one either. The last vertebrae of a bird are fused and called a pigstyle. From the oseo-morphological standpoint, there is no tail to be found in birds, as we may find in dogs, rodents or lizards. Now let me get quickly back to my preferred field of work: aerodynamics...

IS THE FLYING WING THE BEST CONFIGURATION ? ANOTHER APPROACH

People have discussed the merits of flying wings. Karl Sanders has been an excellent devil's advocate for flying wings and it is a challenge to challenge him, but there it goes, Karl...We are going to visualize (praise) flying wings from a different perspective.

It is probably safe to say that Man has learned how to fly from nature. What is also safe to say is that every time Man has strided apart from what nature had to show him, his designs have failed miserably. For the brief period of a year, roughly from mid 1917 to mid 1918 the triplane format suddenly came to dominate the world of fighter plane design, particularly in Germany. If we are in any way aware of this design, we must give credit to

Rittmeister Manfred von Richtofen and to Anthony Fokker. Never more did this configuration come back. Nature never did favor two, three or any other larger number of birds flying one above the other. Flying in the downwash of another bird is not the idea that a bird has of flying efficiently. No airplane is flying at its optimum condition when flying in the downwash of another airplane flying in front of it.

In the seventies, the canard configurations (remember, it is the opposite of Nature's chosen configuration for a bird!!) became fashionable. In the canard we find a very heavily loaded canard (so it stalls first) placed in front of the main wing. Even though from the safety standpoint, this is an excellent arrangement, the main wing is immersed in the powerful downwash of the canard. We never heard of this configuration again in the civilian market. Why not?? If we go to nature looking for help, we will find that no bird favors flying right behind another bird...!!! In the military arena, canard configurations can be of benefit as long as the canard is not heavily loaded.

Throughout this article we have mentioned the word "configuration". If we define this word as the best way of locating one lifting surface in the most efficient manner with respect to another lifting surface and go to nature for the answer, we will see the best solution: a bird, which is a flying wing with a large secondary surface attached to it or so called flap for low speed.

So the first round was won by the flying wing. If we are still not convinced, lets go one step further and see what birds do to reduce their intrinsic induced drag... they form a lambda formation (erroneously called "V" formation, which would point to the wrong flight direction!). Here we see a large flying wing as the configuration (again) favored by nature, were every bird is part of the wing and every bird gains in lift and minimizes energy exertion by reducing induced drag.

It is most interesting to note that the flowfield around a bird formation as a whole is similar to the flowfield around a swept back flying wing!!!

A VERY SOPHISTICATED FLAP INDEED...

As to finish and prove once more that nature has always been ahead of us by millions of years and that it pays to look back at nature for the best of results we will discuss now another remarkable example. The tail of the fork tailed sparrow or fairy tern.

At very low speeds, the tail of the sparrow or a tern goes down and the forked tail opens, slightly reducing the very large sweep of its leading edge feathers. At this point, vortex enhanced lift is present over the tail, giving it a very powerful source of lift and creating a sophisticated tool for unloading the main wing.

Did we humans ever use vortex enhanced lift

in the horizontal tail of an airplane ever?? Yes, we did, but without knowing it...! Fokker, around 1918, designed his triplane airplane (the same we dared criticize earlier) and a unique feature was the sweep of its vertical and horizontal tail. It could achieve very large angles of sideslip and yaw, as well as pitching angles without vertical or horizontal stall by a combination of light loaded surfaces and vortex enhanced lift (at high angles of attack). Without realizing it, Anthony Fokker took advantage of the vortex enhanced lift long ago and we would start to use it in our supersonic designs. Vortex enhanced lift was used "knowingly" the first time by Dr. Reimar Horten in Argentina in 1953, on the high speed fighter I.Ae. 47 delta wing with highly swept wings with sharp leading edges.

CONCLUSIONS

As can be seen, the so called tail is actually a sophisticated second lifting surface or flap that can take the form of a low aspect ratio lifting surface or a delta wing in the case of the sparrow, creating vortex enhanced flow over it or a single slotted flap on the case of most birds like the pigeon. At high speeds, when not needed, it decreases its wetted area and at low speeds it opens up by increasing its span not only to share the weight of the bird with the main wing but to create an upwash in front of the bird's main wing (any flap does this). Once more it seems that nature is telling us something about the efficiency of flying wings. But for us to imitate a bird will be an unreachable goal as long as we do not have reliable active stability mechanisms to keep the unstable flying wing flying! We seem to be flying in the stone age with airplanes with a download in their horizontal tails....!!!

Last but not least, I would like to invite our worldwide TWITTERS to contact me if you have any information on ground effect, formation flying and documentation (videos or still photographs) of birds flying at very high angle of attack and videos on birds flying in ground effect and in formation simultaneously. This information would be highly appreciated.

Phillip Burgers
2556 Nye Street
San Diego, CA 92111

LETTERS TO THE EDITOR

2/23/95

TWITT:

I do not know who to address this letter too, so I addressed it to just TWITT. I'll know who to address the next time I write to your



organization.

I did not know of your organization until Mr. Fred Dieter of the National Air and Space Museum, Archives Division responded to a letter I sent to him. I was asking about the availability of structural drawings of any Horten flying wings that the museum might have in archived storage that could be released to the public. I had ordered drawings from the NASM before. They did have some drawings and I have ordered all the drawings available on the Horten IV that the NASM has. The four gliders that the NASM has in their possession are now in the "Museum of Transportation and Technology" in Berlin being restored for future display in Germany and in the USA. In response to my letter he listed your organization as an advocate of tailless aircraft and as dedicated to the promotion of flying wing theory, design, and construction. He suggested I contact you for information.

Your organization is also mentioned in the book Tailless Aircraft in Theory and Practice by Mr. Karl Nickel and Mr Michael Wohlfahrt. I have many bits and pieces of information on flying wing theory, design and construction, and a few other books, i.e., three books by and about Alexander Lippisch's designs, and Flying Wings, The History of the Horten Aircraft 1933-1960 by Reimar Horten. I gather what I can find. I have been contemplating some specific designs for several years and I feel about ready to move on to testing scale models.

Apparently your organization produces a newsletter? Are back issues, either originals or Xerox copies, available? Please send information about TWITT, i.e., subscription prices, member's list, etc. I have an interest in corresponding with other people about flying wings. I know that in Southern California there are as many designers and producers of flying wing gliders and hang gliders, as there are in Germany. I've seen articles on some of them in magazines like Kit Planes and Sport Aviation plus some mentioned in books. If you know of any flying wings that are in production or are in flight testing stage I would be happy to contact those responsible for creating these designs.

Thank you for your help,
Joel Hirtle
6403 E. Walnut Street
Westerville, OH 43081
(614) 855-9434 (home)

4/18/95

TWITT:

Please find enclosed a money order for \$28.50. This should cover first; the \$18 cost of a one year subscription to your newsletter plus; \$7.50 towards the purchase of 10 back

issues of your newsletter cost listed as \$.75 per copy if multiple copies are ordered. Please make these 10 issues the previous issues printed before the first subscription issue you send me. I've also sent along \$3.00 to cover shipping for the back issues.

I am interested in a listing of what you might have in your library. I'm also interested in helping you with the index of your library holdings, and the index of past news letter topics. I have the ability to optically scan text into computer files. This can save a great deal of typing effort and time! If I can be of any help with these projects please call me. The sooner these problems are solved this information can be quickly disseminated.

I am interested in the areas of flying wing; flight stability and control, airfoil/wing development/design and in past and present structural designs for flying wing aircraft, involving not just materials (composites, i.e. Kevlar, graphite, wood, etc.) but mechanical designs covering control systems, power plant installations, landing gear design, and airframe structural design.

I have a small, at present limited library of information on flying wings. I'll send along a list at a later date of what I have. You can have copies of whatever I have that you do not.

Again, thank you,

Joel Hirtle

(ed. - I have already welcomed Joel to TWITT when I called to confirm our taking him up on the offer to prepare the index. We greatly appreciate him taking on this much needed project and hope he enjoys what he finds in the newsletters as he starts cataloging all the information.)

We just received an article by Jan Scott on the Horten wing restoration project which is very interesting. We will publish it next month, since there is no room in this newsletter.

Obviously he has a lot of interests with regards to flying wings, and we look forward to seeing what he has in his personal library. I imagine he probably has some documents we haven't run across yet, so the exchange should be mutually beneficial.

If any of you share the same ambitions as Joel, you might want to drop him a line or give him a call and compare notes. You never know where it could lead.

Again, welcome Joel and thanks a million for what you are about to undertake.)

2/24/95

TWITT:

The capabilities of Custer Channel Wings, shown and described in Unconventional Aircraft by Peter M. Bowers, TAB Books, Blue Ridge Summit, PA, are still largely unexplored territory. Peter Bowers makes mention of "spectacular demonstrations of slow-speed flight and maneuverability" for the Custer CCW-5. Such capabilities deserve exploration.

The Custer Channel Wings shown are of a two engine type, possibly a single engine version could be tried with a pilot pod/gondola suspended from the lower section of a single wing. There would be some open air space between the lower wing section and the pilot pod/gondola. The motor and prop would fit in the same space as in conventional twin engine Custer Channel Wings.

What would be the glide capabilities of a single channel wing without a motor? Interesting design questions all, as regards the possibility of a single Custer Channel Wing.

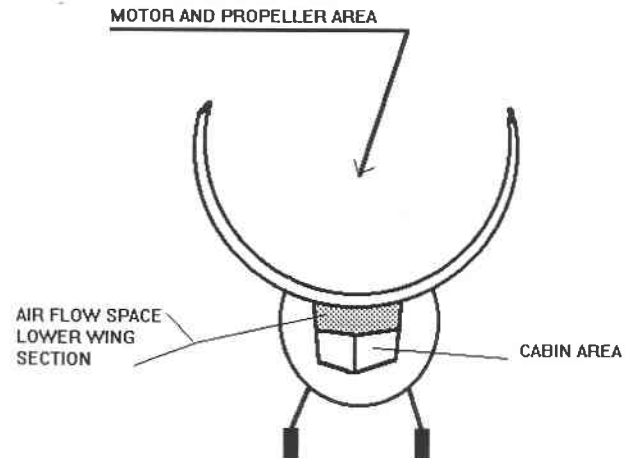
Years ago I recall seeing a picture of a human powered Custer Channel Wing type configuration being developed by someone possibly at a university or college setting. Perhaps TWITT might locate said picture in the library for possible publication in a future newsletter.

Yours truly,

Edwin Sward

(ed. - First off, I would like to apologize to Edwin for getting to this letter so late. Secondly, we have not found the picture in the files, but perhaps one of our other members has seen one and could get us a copy.)

I have included my electronic rendition of your diagram of the proposed single engine version of the channel wing since the pencil version would not reproduce very well. It will be interesting to see what kinds of comments we get from the membership, knowing that they have many different views of what is the best approach to flying wing aircraft.)



ABOVE: The semi-circular area below the curved wing is all passenger pod area except for the shaded area which provides for flow through air along the lower portion of the wing. The diagram did not include a tail, so we are not sure if Edwin meant it as a flying wing. His question was, "Will it fly?"

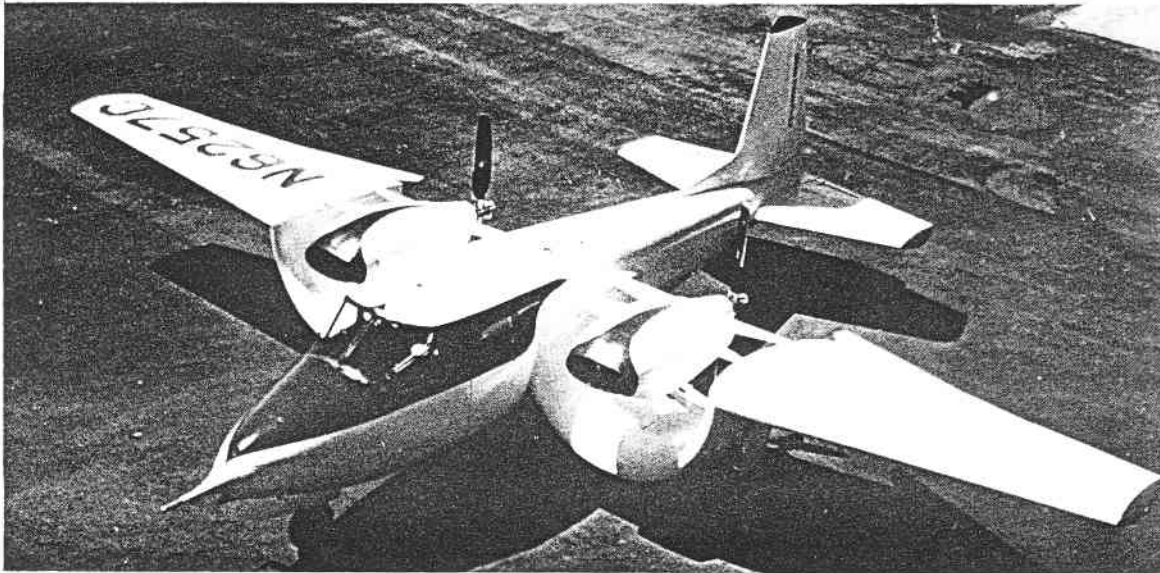


Fig. 6-25. The 1953 Custer CCW-5 used the fuselage and tail of a production Baumann Brigadier light twin-engine airplane.

SOURCE: Unconventional Aircraft, Peter M. Bowers, TAB Books, Inc., Blue Ridge Summit, PA 1984, p.107.

3/22/95

4/19/95

TWITT:

TWITT:

Subject: Publishing help available

It's about subscription renewal time so I'm enclosing a renewal check for another year.

Please note my e-mail address (see below); I finally got on in January. I, too, am shopping for a listserver for some projects of mine. I will be interested to hear what you find.

Plus a note of appreciation for TWITT. I've never encountered a newsletter of such fine quality before; it's a wonderful source of information and for a free exchange of ideas also. TWITT is a unique publication.

I recently found a good monochrome (greyscale) flatbed scanner for a very reasonable price, about \$300. Frankly, I think multicolor graphics is badly overused on the Net, especially in HTML publishing on the Web. It clogs up the narrow-bandwidth comm lines between our service suppliers and our homes and businesses, eats hard disk space and is only rarely useful - a file four times as large should be four times as useful, and it usually ain't. My supplier, JEM Computers, can be reached at jem.computers@channell.com.

I think that this is due to a number of reasons, one of them and the most important for the success of any newsletter is the personal editorial style of the editor. And then there are the contributors to TWITT such as Karl Sanders and Serge Krauss providing readers with a vast storehouse of aviation lore and knowledge.

Typically, the scanners go fast. While I won't donate mine to TWITT, I can still help by scanning material and sending the resulting files over by modem or on disk (or by UUENCODEing them and sending them to your e-mail account, for that matter).

Thank you one and all.

Yours truly,

Edwin Sward

I intend to get into electronic publishing (primarily database publishing) in a big way - to make a career of it in fact. It's a great way to put a lot of postal bureaucrats, predatory fulfillment houses and other parasites out of business, to the greater benefit of mankind.

(ed. - Thanks for the nice comments about the newsletter. I can't take all the credit as you have noted. It is the membership, through their contributions, that make the newsletter what it is. I simply put it all together each month and hope that it makes sense to all of you [I'm a businessman, not an engineer].)

Your renewal comment allows me to remind everyone about how to tell when your subscription is about up. The four digit number after your name shows you which year and month you are due for renewal, e.g. 9505 means 1995 and May. June usually circles it in red when you are getting close, so make sure to glance at your address label from time to time so you don't miss any issues.)

As Archivist and Managing Editor of their quarterly magazine Aerostation, I hope to put the Association of Balloon and Airship Constructors on-line, including providing access to their 1500-plus-volume technical collection through a browsable bibliographic database. My own databases in obscure areas

of technology will also be made available as time, money and demand allow. If I can help TWITT, I will; I'll race you to see who learns the mostest the fastest.

Congratulations on a consistently interesting and well-produced publication, that just got better! [Please put your e-mail address on the masthead, so it appears every month.]

Regards
Marc de Piolenc mdep@thegroup.net
ex-Ed

(ed. - Thanks for the complimentary comments. As you can see the E-mail address has been included in the masthead so it is available each month.)

For you newer members, Marc was the TWITT Newsletter editor in the early years of the organization. If you have any of the first issues you will see the evolution he eventually went through to produce a quality product.

I figure you will win the race on finding listservers and establishing a home page, etc., especially since you are going into electronic publishing on a full time basis.

I will keep the information on the scanner available for possible future use, but right now such an expense is out of the question. However, it does appear the Joel Hirtle will actually be scanning each of the newsletters back into an electronic form, including all the pictures, drawings, etc., so this might make them available for E-mail transmission at some later date. Only time will tell.

We wish you luck on your venture for the Association of Balloon and Airship Constructors, and other related projects.

2/6/95

TWITT:

Here are a couple of articles that could be used for entertainment, if you like.

I wish to thank those who have assisted me in designing my wing. Gilbert Davis has been helping me with what he had learned testing his prototype. I will begin construction late in March when it will be warm enough to work with vinyl ester. I am thankful to those publishers who made available data on the B-35 which I will use. Perhaps, one day I might get to speak with or meet some of the Northrop people who tested it.

Barney Vincelette

It is tempting to ask for the real reason so many airplanes are built with such disproportionately large fuselages in comparison to the wings. Here is an account from the pages of Wilson Bryon Key's book Subliminal Seduction.

In the 1940's and '50's, corporate America was persuaded to employ psychoanalysts to appeal to the subconscious in order to sell things. Evidence of their use of Freudian symbolism can be perceived in such slogans as "It's not how long you make it, it's how you

make it long." According to Dr. Key, aircraft manufacturers too included psychoanalysts to assist them in the design of cargo aircraft. (Apparently, Jack Northrop did not use such services.)

These psychoanalysts claimed that the "military mind", the purchasers of cargo carrying aircraft, would be subconsciously attracted to aircraft if the fuselages most resembled [an anatomical reference was here] in a most elongated condition.

No doubt, even Sigmund would observe that at times a fuselage is only a fuselage. If these psychoanalytic theories were true, it seems reasonable to expect that the auto insurance industry would be able to show by statistics that people who drive Ford Probes would tend to have disproportionately higher numbers of rear end collisions with Volvos; or, in the case of former upper pecking order pioneers, BMW's. And besides, generals immediately purchased the Lockheed Constellation, an aircraft which by Dr. Key's account was designed to resemble a pregnant woman into which 1950's airline passengers could feel they were returning to the womb, as air travel was most frightening to the public in those years.

Notwithstanding, the general shadiness of the use of questionable psychoanalytic theory for such purposes, the Constellation is a very graceful and beautiful airplane, even if it compares to the Northrop wing as Saliere compares to Mozart. Let not a little Freudian symbolism intimidate us out of such nutritional reflections as zucchini for supper or bananas for desert.

(ed. - An interesting, and somewhat risque [I took some editorial license and modified it just a little], analysis for the reasons aircraft probably still have tails to this day. However, the public is "still" afraid to get aboard anything "out of the ordinary" which is one of the reasons the external fan jet engine hasn't made it past the experimental stage although it appears to be more efficient than a cowled fan jet. It amazes me that Beechcraft has been able to market the Starship due to its non-conventional look. Thanks for the humorous look at ourselves.)

I would like to thank those who helped me to find the book Jack Northrop and the Flying Wing by Ted Coleman. In order, thereto, I submit a review of this book.

It tells - in a loosely structured format - the story of the life and times of Jack Northrop, complete with family and company photographs. The story is the tragedy we all know, of an arrogant destruction of a masterpiece.

The reader is given badly needed comic relief, such as the admonition not to "invent rubber gloves to use with leaky fountain pens" and the story of James Howard "Dutch" Kindelberger's (one time president of North American Aviation) 1930's streaking in a transcontinental airline flight. Upon having

been awakened from his sleep by inflight turbulence, Kindelberger walked nude (how he slept) up the aisle past the passengers to the flight crew upon whom he imparted the most vile of expletives. This is typical of how those associated with flying wings are so ahead of their times. Streaking was not socially acceptable until the mid 1970's. (There is a striking similarity between dismissing aircraft tail sections as unnecessary and naturists who maintain that swimming suits are to the swimming hole what tail sections are to aviation.)

There is the story of the test pilot who so disliked Roosevelt that he complained, "Last night as I listened to Roosevelt giving one of his weekly fireside chats, my radio began to drool all over my valuable carpet."

factory buildings; unlike managers who rented expensive, impressive suites miles away in downtown Los Angeles after Northrop resigned. He refused to drive expensive luxury cars, he considered it vulgar to place oneself above one's workers by such displays of status symbols.

He earned his reputation as a man who took care of his workers and of war veterans. When a worker was injured during weekend home maintenance, Northrop asked in earnest why he did not call him at this home so that he could have sent other workers over to help. Upon learning of amputees in the VA hospital he brought together his best engineers to invent better artificial limbs for them and he hired these amputees to assemble aircraft parts in their hospital beds.

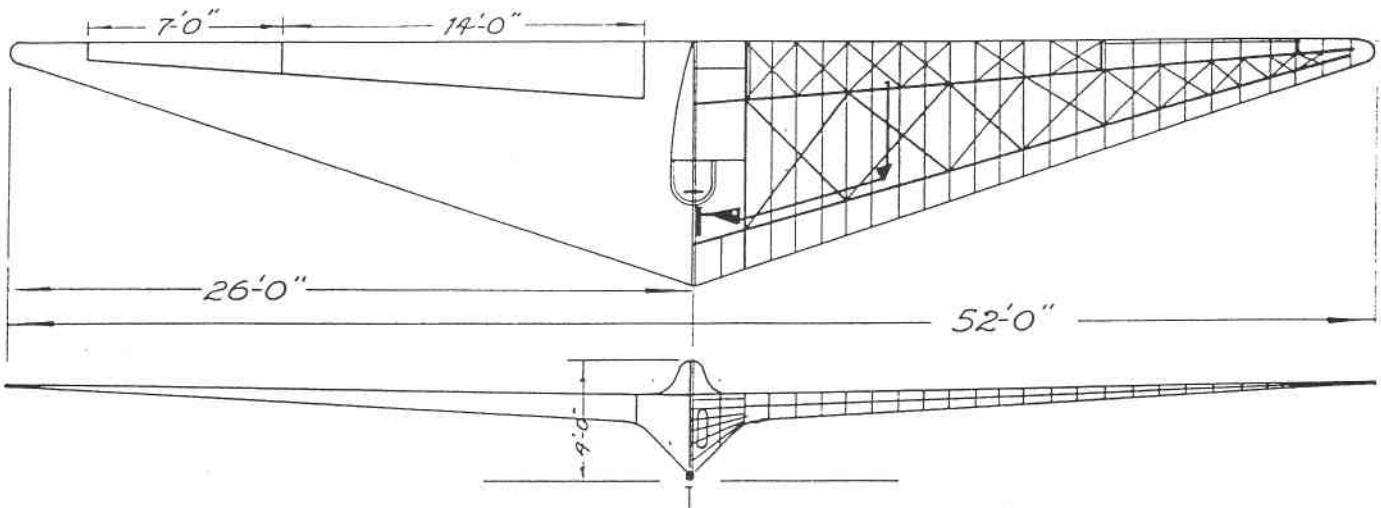
AIRCRAFT RIGGING
San Diego Senior High School

—○— FLYING WING —○—

Scale— $\frac{5}{32}$ "=1'-0" Jan. 4, 1935

Drawn by CL. Freel Chief Engineer
Checked by *[Signature]* Instructor

TABLE of CHARACTERISTICS	
Span ft.	52'-0"
Aspect Ratio	3.2
Wing Loading lb./sq.ft.	1.68
Airfoil Section	NACA-M-6
Wing Area sq. ft.	270
Weight Empty lbs.	280



ABOVE: Two-view taken from historical summary of Charles Freel's project. Bob is continuing research on this to find out what happened to the aircraft.

The real contribution of this book is its accounts of the Maestro from his family and those who worked with him. His children told of growing up in a happy home filled with classical music. He excluded cocktail parties and nightclubs from all his social engagements and he dispensed with small talk. He never drank or smoked. He was disinterested in political negotiations and expected whatever he was promised. He took people at their word.

As president of his company he kept a small and simple office in the corner of one of his

The accounts in this book are by people who were there and this makes it more than a history book.

HISTORIC SAILPLANES GATHER AT HARRIS HILL

The International Vintage Sailplane Meet (IVSM) will be held at Harris Hill, Elmira, New York, on July 17-24, 1995. This will be a gathering of about 50 vintage sailplanes, 10 of which are coming from foreign countries. There will be both bungee and winch launches,

as well at the more modern aero tows.

It is our understanding that there will be a number of TWITT members attending throughout the event. Bob Fronius and June Wiberg will be there, so for you east coast TWITTERs who would like to meet with and talk to one of founding fathers of TWITT, this will be an excellent opportunity.

We will put a reminder in the newsletter of the coming months, but thought it best to give you as much advance warning so you can plan your vacation time appropriately.

AVAILABLE PLANS & REFERENCE MATERIAL



Tailless Aircraft Bibliography

by Serge Krauss

4th Edition: An extensive collection of about 2600 tailless and over 750 related-interest

listings. Over 15 pages of tailless design dates, listing works of over 250 creators of tailless aircraft, and the location of thousands of works and technical drawings for the Ho 229 (IX), Me 163, & Me 262.

Cost: \$23 (Domestic)
 \$32 (European destinations)
 \$35 (Asia/Australia destinations)

Order from: Serge Krauss
 3114 Edgehill Road
 Cleveland Hts., OH 44118

Tailless Tale, by Dr. Ing. Ferdinando Gale'

Consists of 268 pages filled with line drawings, tables and a corresponding English text. It is directed towards modelers, but contains information suitable for amateur full size builders. Price is \$38, postage and handling included (also applies to Canada and Mexico).

You might also want to purchase his new book **Structural Dimensioning of Radioquided Aeromodels**, priced at \$18.00.

On The Wing...the book, by Bill and Bunny Kuhlman (B²) is a compilation of their monthly column that appears in RCSD. Many of the areas have been expanded and it includes coding for several computer programs to determine twist and stability. Priced at US\$28.00.

All these are available from B² Streamlines, P.O. Box 976, Olalla, WA 98359-0976, or (206)

857-7249 after 4pm Pacific Time. Orders shipped elsewhere will be sent surface mail unless an additional \$10 is included to cover air mail postage. Washington residents must add 7.5% sales tax.

VHS VIDEOS AND AUDIO TAPES

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 4 hours of material).

Priced at: \$8.00 (postage paid)

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 tape of Alex's presentation explaining the material.

Priced at: \$5.00 (postage paid)
 \$6.50 foreign (postage paid)

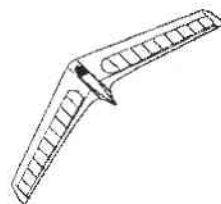
Audio tapes of presentations by Don Mitchell at the September 1991 SHA Western Workshop, Tehachapi, CA (1 cassette), and his March 1992 presentation at a regular TWITT meeting (2 cassettes).

Priced at: \$3.50 (1 cass.)
 \$4.00 (2 cass.)
 Add: \$1.00 for foreign postage

Audio tapes of the presentation by Barnaby Wainfan at the September 1994 TWITT meeting where he discussed his prototype FMX-4 Facetmobile, low aspect ratio ultralight airplane.

Priced at: \$4.00 (two tapes)
 Add: \$1.00 for foreign postage

FLYING WING SALES



The A-10/T-10 Mitchell Wing motor gliders are well-proven designs, ready to fly, with an aluminum clad wing giving aerodynamic cleanliness.

These are fully trailerable, with flight instruction provided in a T-10 by a C.F.I. Major components are available for the homebuilder.

Information pack for \$10.
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