No. 253 JULY 2007

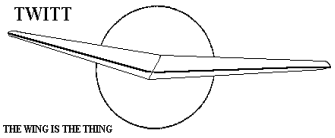
T.W.I.T.T. NEWSLETTER

Twin engine flying wing (blended wing) design by the team from California State University Long Beach. See the Letters inside for more and how this could be the subject of a future program.

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., **0707** means this is your last issue unless renewed.

Next TWITT meeting: Saturday, July 21, 2007, 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:

President: Andy Kecskes (619) 589-1898
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

(619) 447-0460 (Evenings – Pacific Time)
E-Mail: twitt@pobox.com
Internet: http://www.twitt.org
Members only section: ID – **twittmbr**
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Wt/#Issues	FRG	AUSTRALIA	AFRICA
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Meetings are held on the third Saturday of every other month (beginning with January), at 1:30 PM, at Hanger A-4, Gillespie Field, El Cajon, California (first row of hangers on the south end of Joe Crosson Drive (#1720), east side of Gillespie or Skid Row for those flying in).

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PRESIDENT'S CORNER

Included in the letters column this month is my apology to William Foshag for failing to keep up the newsletter issues at the Library of Congress of the past years. The condition has been corrected as of the June 2007 issue and I will be sending a current copy to the LOC with each mailing in the future.

I have also delved into the issue of programs again in the letters section in response to an offer to do a program for us. It is nice when a program sort of falls into our laps, but I don't want to setup the event if we are not going to have good attendance, which isn't fair to the speaker. So please read through that section and contact me if you think you can make the September meeting.

Over the next couple of months Doug Fronius, Gavin and myself will be working on consolidating the TWITT archives into a new section of the Fronius hanger. Our preliminary examination of the vast amount of material in the bookshelves has found some historic magazines like Model Aviation News dating back into the 1950s and 60s. Although the final decision hasn't been made, some of these magazines could be available to people interested in this type of history. There are also copies of Sport Aviation and Soaring that may have some odd months available to those who want them. I will publish more on this as the plans are finalized, but if you are interested is obtaining historical aviation magazines let me know and I will contact you with a listing of what's available. Postage fees may apply depending on where you are located, but the magazines will be free.

LETTERS TO THE EDITOR

(ed. – I put the following here since I get the feeling some of our members don't always read through my column (no offense taken). I have already sent a personal apology to William, but felt it was necessary to also publish this apology.)

I want to make a formal, public apology to William Foshag of Carlisle, PA for not carrying out my commitment to sending copies of the newsletter to the Library of Congress. William set this up many years ago so there would be a permanent record of our newsletters in the public archives. I sent in an initial set of newsletters with the intent on sending in a yearly batch versus doing it monthly.

However, I let him down by not performing the yearly task so the last issues at the Library dated back to 1995. I have no excuse for this lack of effort on my part in pulling together the issues, boxing them up and putting them in the mail. It was my responsibility, but it didn't get done.

In an effort to correct my failure, over the past couple of months I have been able to determine which issues were needed to bring everything up to date and obtained the correct mailing address for the copyright division. As of July 2nd, the last box was mailed to the Library to bring the issues up to June 2007. I have setup a label for a monthly mailing as each issue is published so this lapse will not happen again.

I have also found out that the Library is not fully into the digital age yet, so they are maintaining hardcopies of the issues that could be viewed while visiting the Library. If you should ever find yourself in Washington, D.C. and want to view some older issues the LC Control Number is 95644340, Call Number TL684.6.T85. The older issues can be requested in the Jefferson or Adams Bldg General or Area Studies Reading Rms, and the more recent (Apr '95 and later) requested in the Newspaper & Current Periodical Reading Room (Madison LM133). This is according to the information found on the Library's website.

I also need to thank Gavin Slater for putting in the time and effort to determine which issues we need to make copies of in order to preserve at least one copy for each of the old manual master documents. This has also led to an initiative to get all past issues into an electronic format that could be saved to a CD-ROM and distributed, or for placement on the website. The advantage here is that the reader will have the color copy for issues created after sometime in the year 2000. Issues prior to then were done with half-tone pictures in a gray scale for printing.

I hope William will accept my profound apology for failing to live up to my responsibility for maintaining an archival record of the TWITT Newsletter at the Library of Congress.

Andy

June 4, 2007

The attached Photos of the Burnelli Bushmaster CBY-3, sometimes referred to as Loadmaster or Liftmaster. They were taken by myself in mid 1954 at Teterboro Airport, Teterboro, New Jersey. While certainly not a total wing, it was quite unique for the time.

At the time I snapped them, I knew very little about that aircraft, except that it was a Burnelli project. I kept the original photos in an envelope with all my other photos. When I had seen it on your site, I knew I could put my photos to good use.

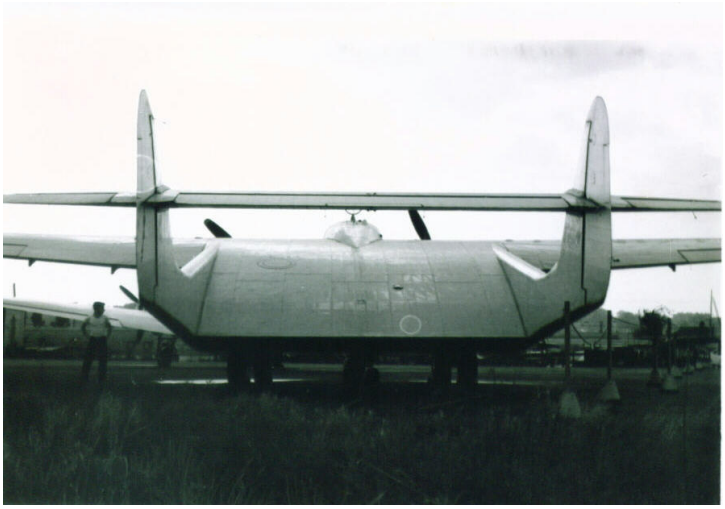
That aircraft now sits outdoors at a museum in Connecticut; completely disassembled and rotting away. Although it was not completely a flying wing, it certainly was a lifting body experiment with conventional empennage.

Regards,

Bob Richards
inge@webcosolutions.com

(ed. – Hopefully, by the time you get this I will have updated the website to include these photos and the link to Ed Coates website with other pictures. I want to thank Bob for taking the time to dig out his pictures, scan and e-mail them to us. They will make a nice addition to the piece.

I included the photos below. They were all in black and white.)



The next two came from http://www.edcoatescollection.com/, which was found by searching N17N on Google. Of particular interest is the manual DF loop atop the cockpit. This certainly tells its age. There was also a dual tail wheel assembly.

June 6, 2007

Hi:

My name is Daniel Dougherty. I'm a big fan of flying wings and think your website is great! I'm a Masters student at CSULB (California State University Long Beach) and I work at Northrop Grumman in Advanced Design as a configurator.

I recently entered my own twin engine flying wing (blended wing) design in the SAE AeroDesign West competition in March, representing CSULB Aero. (*See cover.)* This is a heavy lift competition with a 100 ft takeoff distance requirement. We won the open class - the first flying wing to win this competition to my knowledge.

Here is a link to a video of our winning flight (that's me releasing the aircraft):
www.youtube.com/watch?v=-v7IDrsQWNI

Write up in the school newspaper:
www.csulb.edu/colleges/coe/mae/views/news/news_2007/student_accomp_3_07.shtml

In the spirit of increasing knowledge and interest on the subject of flying wing design - I would be glad to share the details of my aircraft with your club members. I have a slide presentation that I put together for an oral report as well as a 30 page written report that goes into further detail on the design. Unfortunately, I cannot bring the airplane with me, we crashed it in the SAE 'East' competition in early May (radio problems!).

Sincerely,

Dan Dougherty

(ed. – I wrote back to Dan about possibly doing such a program on September 15, 2007. The reason for the long delay is so I can poll the southern California membership about getting their commitment to attending the presentation.

Since we have been meeting deficient over the past couple of years, attendance when we have had a program was noticeably short of attendees. I don't want Dan to come down and then only have 5-6 people show up, which wouldn't be fair to him.

So I would like to hear from those members that would plan on attending the September meeting. If we have enough interest to make a good size group for Dan then I will complete the arrangements with him. I understand you can commit now and something might happen where you can't attend, but I would at least like to know the potential is there for a good audience. ***So please let me know as soon as possible by phone (619-589-1898), e-mail or snail-mail on whether you think you will be attending so I can make the appropriate plans.***

I got the following back from Dan, so it sounds like he has a lot to share in the area of flying wings/BWB, so it would be great to have him down.)

Dan wrote:

I'd be glad to present either in July or September - whichever date you think would provide the greatest value to your club members. If you can give me a few weeks notice, that would be great.

I'm really looking forward sharing my insights with your club. Part of the reason I designed and built this flying wing is so I can share the knowledge with others on what I believe is a very advantageous aircraft configuration.

Currently I'm working on a promising airfoil section for tailless airplanes. It provides positive pitching moment without reflexed camber, thus one can attain positive lift at 0 deg AOA while still maintaining the positive pitching moment required for trim. This could possibly provide increased takeoff performance and cruise

performance. I'm also working on a flap design that increases Clmax for BWB designs that trims with trailing edge down deflections (thus providing an advantageous shift in zero lift AOA). Both of these concepts, I believe, would be of interest for your club members.

Looking forward to hearing from you soon!

June 11, 2007

I will donate a B-10 to a member who could pick it up in Sacramento. It is quality built and about 80% complete with a new Patmont cage included along with two sets of plans and factory photographs. Also, have a Hummer ultra light that has a Zenoah G25b engine with re-drive and 54" prop, which I will sell for $1000. The engine will work perfectly on a B-10 in case the Hummer is not desirable. I have flown the Hummer for about 150 hours, years ago. It has been modified to have 3 axis controls. Here is my phone number in case someone would like more information.

Note: My B-10 is gone. It was picked up today *(ed. – by Richard Avalon)*. Thank you for your help. The Hummer is still available.

Vic Gibson
916-722-9692

(ed. – This was too good to hold until the next newsletter so I sent the information out through the Nurflugel Bulletin board. I got the B-10 gone message on June 16th, so it didn't take very long for someone to take Vic up on his offer. I included this just to let you know there are people out there like Vic that don't want to see these flying wings just sitting on the ground and are willing to make this type of offer.)

June 15, 2007

The Horton Wingless Aircraft deserves to be featured in my latest book "An Illustrated History of Roadable Aircraft and Flying Vehicles Worldwide". Any information you can send will be appreciated.

I need photographs, preferably black and white glossy prints, but I can use dull finish or color, if that is all that is available. Usable are concept design sketches, prototypes (various angles), detailed close-up features, visualizations, montages, designers and others on the project, company or vehicle logos, magazine covers, museum shots, etc. Please be sure to identify all objects and people for the caption.

If you need any or all returned, I can get copy prints and send back the originals promptly.

In WWII the Army sent me to Lehigh to study engineering and I served in England in the Army Air Corps.

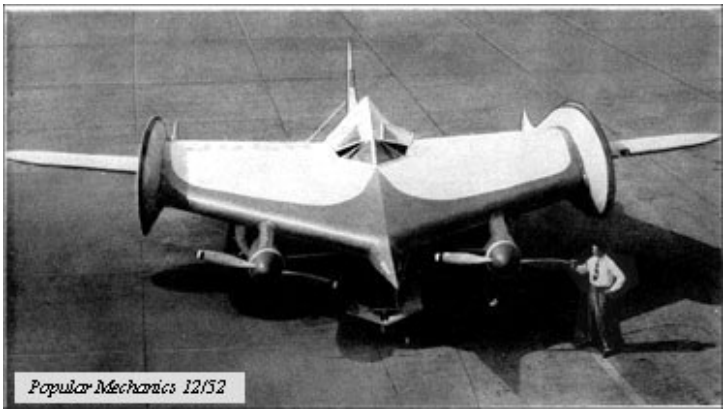
Sincerely,

George Green, President
Green's Writing Services
Dearborn, MI
(313) 563-9107

(ed. – I called George to let him know we don't have any original information other than what is currently shown on our website. I did give him Russ Eckre's address to see if he can be reached for some of this material. Russ was the one who introduced TWITT to the Horton Wingless and he was planning on writing a book about it, with the possibility of a short movie, but we haven't heard anymore lately.

They say timing is everything. I just heard from Russ who was trying to locate Phil Burgers. I took the opportunity to pass the information from George in the event Russ was interested in pursuing passing anything along for a possible publication.

In case you forgot what the Horton Wingless looked like, I have included one of the Internet photos that is available.)



Extracts from the Nurflugel Bulletin Board

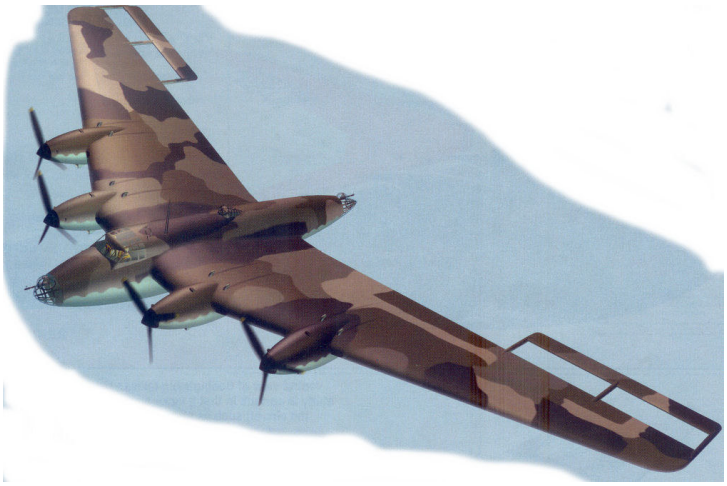
June 13, 2007

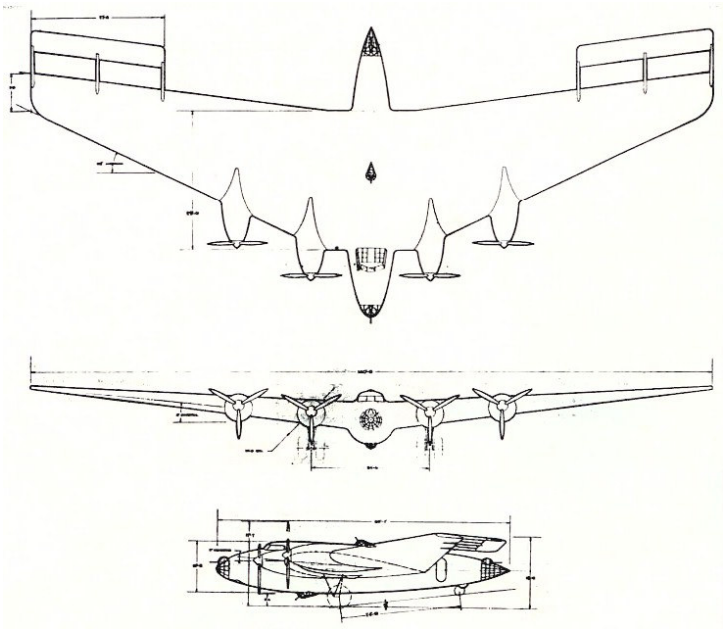
I came a across a reference for the Boeing 306B flying wing concept model in Flying Models magazine. As no picture was include I Googled this and got this interesting web site: http://www.secretprojects.co.uk/forum/index.php?topic=286.0;prev_next=prev

Niffty pictures. I do wonder about those trailing flaps however. It almost appears that the Boeing folks felt that something was needed to push the noise up on a flying wing. Or are those Junker flaps to shorting take-off and landing runs?

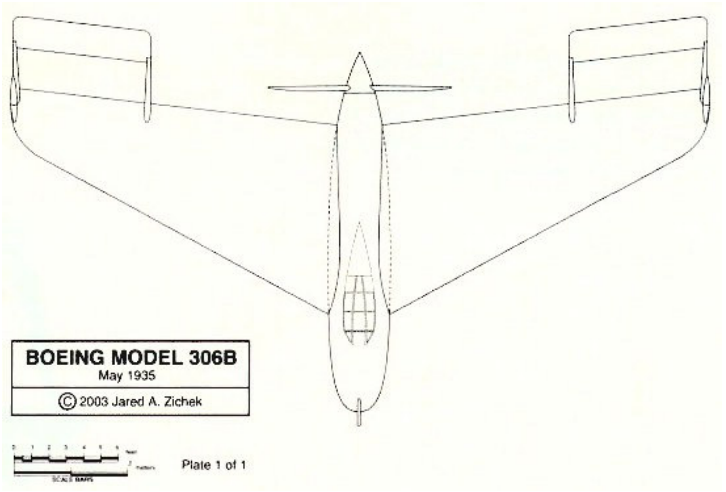
Does anybody know for sure?

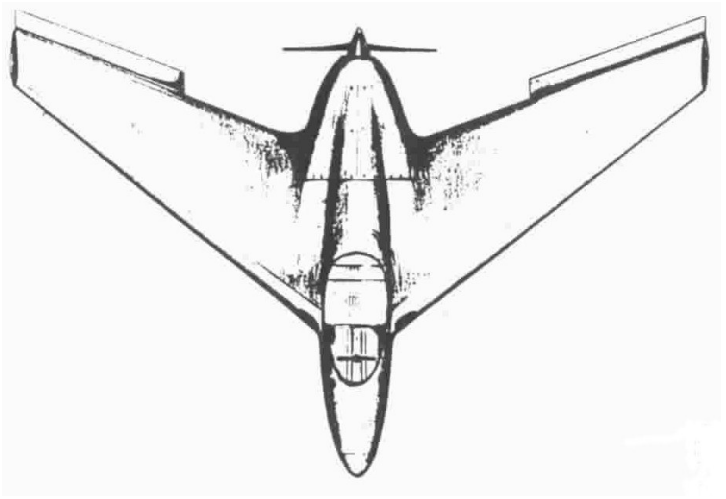
Warren Bean





(ed. – Here are a couple of pictures from the website. There are many more showing various versions along with some fighter types. I found the 306B drawing had a resemblance to Don Mitchell's proposed Goodyear Racer but without such exaggerated elevons, so I have included these images to see if you think the same thing.)





This trailing edge flaps are similar to those on the Don Mitchell flying wing designs (http://www.mitchellwings.com/) but I would like to know if both have the same function, does anybody know it?

Miguel-Angel Rodríguez
marpbcn@hotmail.com

The trailing surfaces do function as elevons but are not Junkers flaps. The slots of Junkers flaps (and Don Mitchell's stabilators) are a fraction of the airfoil thickness. The Boeing surfaces are much to far away from the wing to have the constructive slot effect that Junkers and Mitchell were using. It looks to me like the Boeing engineers were just trying to move the tail away from the fuselage on that 4-engine bomber to give the tail gunner some elbowroom.

Norm Masters
nmasters@acsol.net

But would these work well as control surfaces on RC 'wings? Be any improvement?

Doug Holverson
dholverson@cox.net

It seems that Austrian designer Otto Kauba used a quite similar surfaces system on his Skoda-Kauba SV1 (straight wings) and SV2 (swept wings) experimental aircraft in 1941 and 1942 but without much success.

All the best,

Philippe Vigneron
retrofitprsp@yahoo.com

Hi Doug:

I have got a sneaking suspicion that these Boeing concepts may have been drawn with the odd elevon design to send the evil empire some misinformation; something to use up some of their precious engineering time.

I wouldn't bother with this sort of controls for a R/C project and I'll tell you why.

Long ago, back when U-control airplanes flew on stainless lines, when the Fox 35 or McCoy were used without throttle control, there were those who did participate in combat. Duking it out meant attaching crepe paper streamers to the tail of the airplane, and the pilots had to cooperate to keep the lines from getting twisted up. Mid-airs, and encounters with terra firma were quite common I assure you. The airplanes were special made from low quality balsa, with die-crunched parts, often covered with paper. I flew one called the "VooDoo" and it was a flying wing, with the engine neatly set into the leading edge of the wing, and the elevator was on the end of two lite-ply booms. No horizontal stabilizer, just the elevator, with a couple of pieces of music wire for hinges run through the vertical plywood booms. The airfoil was a simple diamond shape. Quite odd, but it did allow the modeler to build a straight wing rather quickly.

The aircraft was nearly impossible to control, fine, small control movements did nothing, and with larger movements of the control handle, it would loop and dive with ease, doing so on the very edge of my mind's ability to comprehend exactly what my control suggestions were doing.

Fortunately, this airplane did not last long and you can add the "VooDoo" to the list of U-control airplanes that did not fly well, and while able to turn quickly, were nearly impossible to fly.

Long time ago it was, over thirty years ago

Clayton Roach
electrichero@yahoo.com

June 20, 2007

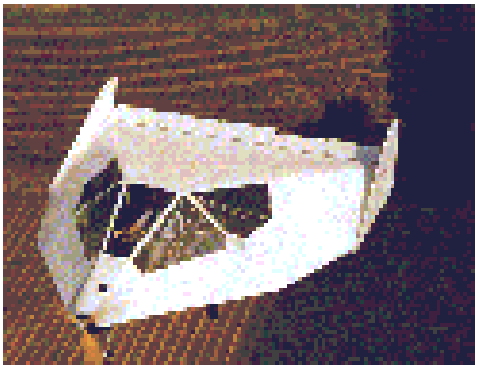
Recently I tried to find the Wainfan's website about the Facetmobile, but the site seems to have disappeared. Does anyone know where to find it or any other info on this aircraft?

Thanks,

Tom Rupprsa
trupp@hutz.co.za

Here you are:
http://members.aol.com/slicklynne/facet.htm

Bruno
msmprod@optushome.com.au



Not exactly a beauty, but an amazing plane nevertheless. Who would have thought that it would perform so good?

Hats off to the Wainfans.

Thomas Rupprsa

Actually there is an error on the web site. It clams no kits (I assume model kits) are available. Check out: http://www.eam.net/EAMRC/slowfly.htm I am told this flies pretty good.

Warren Bean

warren.bean@gmail.com

ABOVE: This is the model version that can be ordered through the above website.

Bruno:

This is true, but the we are not all getting any younger, and we can't wait much longer for a 2 or even a 4 seat version.

If you get a chance purchase Issue 71 (I believe) of "Contact!" Magazine of which almost the entire edition is dedicated to the FacetMobile and authored by Mr. Wainfan. There is so much more to this bird, and this article gets into all the facets :-) of it....

My Best,

Anthony
enginegeek2@yahoo.com

Thank you. As much as I can appreciate the Facetmobile, I am involved in ground effect more than anything else and I have reached valid results just recently, so I am pursuing this avenue.

Cheers from Bruno

It pains me to say this. I know Barnaby (for about 20 years actually) and he is a pretty good guy.

The Facetmobile was a great little exercise in the art of the possible. But aerodynamically, it is an affront in violating airflow. It has to be one of the worst aircraft from a fluid mechanics perspective.

To me, elegance would be a Nimbus II (really a blown-up std Cirrus) or the ETA. In classical sailplanes you could look at the Minimoa, or an HIV (oh yeah). A Mooney (especially post-LoPresti) or AJ Smith's CAFE racer, or the P-51D (even with its faults), a Supermarine Spitfire (I'm still torn between Griffon engined and Merlin engined Spits), or even the Me-109 (except the Gustav's with their Buerle's). A-1 Skyraiders, and the PBY Catalinas even. The F-104, the F-106, the SR-71A (despite all its faults), the MiG-21, the T-38, the F-4, the F-15, and the U-2; all are beautiful.

I draw the line at the F-117A. Sorry. I can even appreciate the B-2 (if only NGC had understood Reimar! In 1948 or 1978!).

I guess I spent too much time studying laminar flow as an aerodynamicist...

Al Bowers
al.bowers@dfrc.nasa.gov

Wright Bros aircraft wasn't beautiful, but it flew.

harry685@cox.net

It has an antique charm.

Doug Holverson"

Even more so. The Wrights flew on 12 hp, when Langley, Santos Dumont, and others were working with four-times that much power. THAT is efficiency, and elegance. No, the Wrights built beautiful aircraft in the classical sense.

I gave a talk on the Wrights twice this week. And the things I emphasize are:

1/ the great technical achievement prior to their flights was the railroad. This caused people to think about "two-track" vehicle systems, vehicles that would only yaw to go around corners. NOBODY was thinking of BANKING to go around corners (except the Wrights, a couple of BICYCLE builders, and possibly Glenn Curtiss, who was a MOTORCYCLE RACER). It took "one-track" vehicle thinking to solve the "bank -to-turn" paradigm. For proof, I give you the Wright's patent (#821,393). Go look it up. There are no propellers, and no motor. The patent is for wing warping or any mechanism in which roll control can be achieved. And that is also why they took TWO photos on 24 Oct 1902 of their GLIDER in banked COORDINATED flight. I defy ANYONE to show a photo of an aircraft in banked, coordinated flight, prior to THAT date. Bank-to-turn...

2/ They learned to fly first, and then they built an airplane. And even then it took TWO years before they perfected the aircraft (the 1905 Wright Flyer III was the first "practical" airplane). The only reasons that the 1903 Wright Flyer I and the 1905 Wright Flyer III exist today is because of mistakes or accidents. The WFI was broke up on its last landing in 1903, and was crated and shipped home. But they built a BETTER aircraft instead, the 1904 WFII. And the WFIII needed to carry two people AND to have them seated, which the 1905 WFIII could not do, so the Wrights built new aircraft for their 1908 demos. Note: the Wrights did not preserve the 1899 kite, the 1900 Glider, the 1901 Glider, the 1902 Glider, or the 1904 Flyer. All were destroyed, left to rot, or BURNED. They were always thinking about their next great experiment. And it is only by the grace of the most benevolent that both these aircraft exist today (note: the 03 WFI is about 65-70% original, and the 05 WFIII is about 95% original).

Beautiful aircraft in the classical sense. Right on Doug...

Al Bowers

I agree that the Santos Dumont Demoiselle was probably one of the most beautiful airplanes ever built. I know the Al listed some beautiful airplanes but the Demoiselle should have been at the top of the list. It was also the first plans built available to the public. Dumont intended it to be built by anyone from plans.

Jim Sparks
spider@candw.lc

July 7, 2007

Check This Giant BIRD!

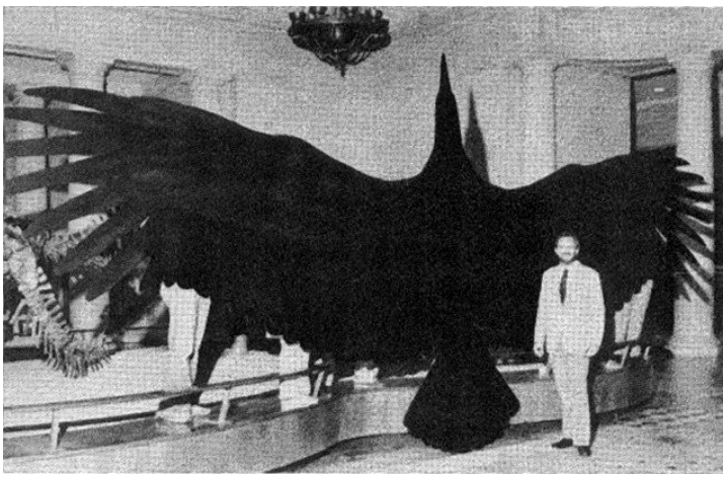
http://ozreport.com/forum/viewtopic.php?t=8500

Had no idea flight capable birds made it to this size

Bob Hoey model THIS !!!

Larry Witherspoon
ssspoon@aol.com

(ed. – I have included a couple of the images from the website so you can get an idea of what Larry is asking of Bob.)



Extracts from the U-2 Bulletin Board

June 9, 2007

Has someone seen a U2 motorized with a KFM 107 engine?

Norbert Mosson
norbert.mosson@total.com

I have a KFM 107er in my U2. It will give 24hp. The earlier problems were with flooding, but now I know it depends on the needle valve that will stick with the oil mix in the fuel if the engine will be standing a longer

time. So the best is to rinse it with pure gasoline. Never had a problem with temperature.

Pekka Klarsater
u24692@yahoo.com

June 9, 2007

Hi there :-) I have few questions:

1) Does anybody knows if there exists a U2 from Dural like the A-10 or T-10?
2) What is newest and what is highest performance design of Mitchell wings?
3) Did Bernie Fournier build his U22?
4) Has anybody tried to use some PPG engine 27HP / 14kg on U2 or B10 ?

Thanks

Jiri
blue.kid@atlas.cz

I live in Topeka, Kansas. A few years ago, a man leased an abandoned missile silo near here and started producing metal-winged Mitchell Wings. These were constructed by cutting foam cores to airfoil shape, and wrapping the cores with thin aluminum. The enterprise is no longer operating, but he may have sold the rights to a company in Iowa.

They had a nice fiberglass fuselage, and flew very well. I flew my homebuilt there to an open-house once, and they were giving rides in a two-place model. It flew very well.

I have never heard of an aluminum U2. It could probably be done, but any modifications to an existing design invariably increase its weight.

D & J Gingerich
dgingerich@cox.net

July 5, 2007

Hi everyone.

Haven't posted in a while. Lost my B10 last week. My dad was flying it, and had to spend the week in the hospital. Transport safety board had a look at the plane. My plane is the basic B10, with a frame that was very popular up here in Canada in the mid 80's built out of Lazaire, Quebec.

Anyway, the plane had a 447 Rotax and flew wonderfully (good climb in woody areas). Anyway, 80' above the ground, the left rudder stuck open. Turns out the sleeve in which the rudder cable runs when it exits the frame and enters the wing, on the wing end, pinched the rudder cable, to the point where the spring (and later on the ground, the inspectors) could not return the rudder to it's neutral position. The cable and sleeve has been in the plane from the beginning (1984) and had 284 hours on the airframe before failure. Airplane had a slow spiral into the ground (opposite rudder and aileron increased the radius of the turn, but could not level the plane).

If you have a sleeve, check it. Hate for anyone else to get hurt.

Unfortunately the plane is totaled, she'll never fly again.

Jim
assiegordon@yahoo.ca

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: 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.

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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.

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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.

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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
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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
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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.

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BLUEPRINTS – Available for the Mitchell Wing Model U-2 Superwing Experimental motor glider and the B-10 Ultralight motor glider. These two aircraft were designed by Don Mitchell and are considered by many to be the finest flying wing airplanes available. The complete drawings, which include instructions, constructions photos and a flight manual cost $140, postage paid. Add $15 for foreign shipping.

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