

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



<http://www.physorg.com/news2487.html>



## **T.W.I.T.T.**

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

*HAPPY*

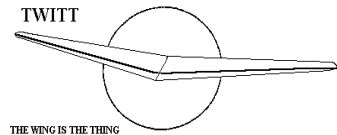


*HOLIDAYS*



The number after your name indicates the ending year and month of your current subscription, i.e., **0712** means this is your last issue unless renewed.

Next TWITT meeting: Saturday, January 19, 2008, beginning at 1:30 pm at hanger A-4, Gillespie Field, El Cajon, CA (first hanger row on Joe Crosson Drive - Southeast side of Gillespie).



**THE WING IS  
THE THING  
(T.W.I.T.T.)**

**T.W.I.T.T.** is a non-profit organization whose membership seeks to promote the research and development of flying wings and other tailless aircraft by providing a forum for the exchange of ideas and experiences on an international basis. T.W.I.T.T. is affiliated with The Hunsaker Foundation, which is dedicated to furthering education and research in a variety of disciplines.

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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**

I want to wish everyone a happy holiday season and hope that you are spending it with your loved ones. Here in southern California it will probably be bright, sunny and warm on the 25th so we will have turn up the air-conditioning to make it feel like true winter.

The issue is a little late this month. I just didn't pay attention to the calendar and was thinking I had another week to get it ready for the printer. Then all of a sudden I realized November 1<sup>st</sup> was on a Saturday and the newsletter was due in the mail that following week. Obviously I didn't make that time line but with no program to announce and it being a holiday month, I figured it was better to try and put together a good issue rather than rush something to press. Lots of pictures this month so hope you enjoy them.

I got a few e-mails from members who enjoyed the last pages of the Boeing 306 project. It is great when the members step up like Paul to obtain this kind of material that can be shared with everyone. Our thanks to Paul for taking the initiative.

This issue will allow me to catch up on all the past e-mails and mail that has come in over the past couple of months. I want to thank all of you who have contributed and please keep it up.

Gavin and I have been working with Doug Fronius to continue consolidating all of the TWITT library and other miscellaneous publications into the back area of the main hanger. It is also leading to some house cleaning and going through the material so who knows what interesting things we may come across that we forgot were there. Stay tuned.

In case I haven't mentioned it in the past (I sometimes forget from month-to-month what I have covered) I can now provide the various VHS tapes in the classified section of the newsletter and web site in DVD format.

**HAPPY HOLIDAYS TO EVERYONE**

*Andy*



**JANUARY 19, 2008  
PROGRAM**

**A**s usual, the most I can tell you is there is nothing scheduled for the January meeting at this time. If anyone has a definite contact that would be available on the 19<sup>th</sup>, please let me know. I will be at the hanger no matter what since the event is publicly advertised and can be used by aircraft owners looking for a display date they can use for offsetting property taxes for those counties that allow it.

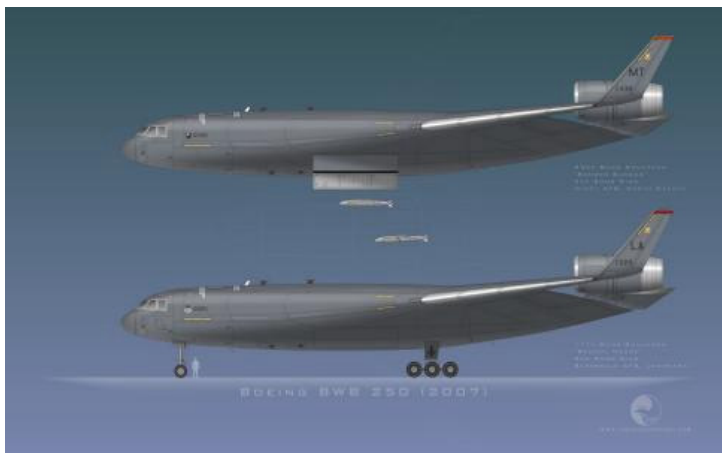


**LETTERS TO THE  
EDITOR**

October 29, 2007

This may be of interest to you....

<http://www.up-ship.com/eAPR/ev1n3.htm>



Scott Lowther  
<scottlowther@ix.netcom.com>

*(ed. – This site has a large number of line drawing of various BWB designs. This is the lead-in from the site:*

“Issue V1N3 of the new electronic APR (PDF file format on CD-ROM) features four article. The primary article in this issue is on Blended Wing Bodies. This article covers designs from just after WWII until today, but largely focuses on the McDonnell-Douglas/Boeing efforts from recent years. This article is 35 pages long, of which three are large format (11X17) spreads. Along with photos and artwork, this article is illustrated with two dozen general arrangement drawings.

Includes designs such as the recent European VELA studies, Russian designs from the TsAGI and Tupolev, early Northrop studies and the Lockheed CL-1201, probably the largest aircraft ever seriously proposed.”

*We are just providing this as information and in no way are endorsing this product, so you have to make your own decision about purchasing it.)*

November 9, 2007

**T**he November edition of the TWITT newsletter made it to the postal box this morning. The previous inclusion of the Boeing 306 projects raised the question of who was the motivator for a tailless design at Boeing. There are a few folks in my area who were associated with Pratt & Whitney starting before the decade this Boeing project was initiated was over. They had no knowledge of the work, other than its coverage in some of the popular magazines of the period. If anyone has any detailed knowledge of the design team for the 306 please chime in here.

Another question raised by the article: Was the internal structure of these airframes to be similar to the Project 299 (B-17) in use of Warren Truss structure? Mention made of the Boeing Historical Archive in the article acknowledgments. I believe I will pose the questions there, as well as here.

As far as the non-acceptance of these designs as combat aircraft I see one point that would have made me reluctant to actively operate the aircraft. The control surfaces are of such construction that the least amount of battle damage would have rendered them less than inoperative.

Regards

Henry E. Whittle  
<Gulfrose@Juno>

*(ed. – Thanks for posing the questions. Hopefully someone will have the answers or know where they might be found.)*

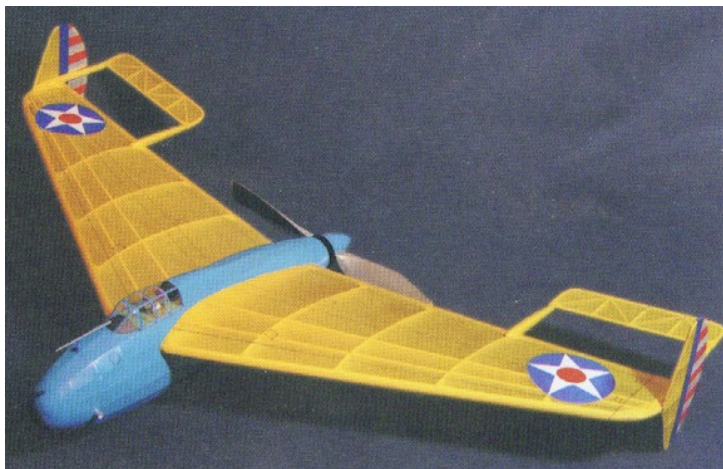
**A**s far as I know, no one of the tailless planes depicted on the #254 of the TWITT newsletter ever flew.

However, a keen American modeler, Mike Isermann, has built a greatly scaled down replica of the simple Boeing 306B. It is a rubber powered free flight model: it spans 26” and weighs 38 grams without the rubber. At 110 square inches of wing area, the wing

loading is approximately 0.5 grams/square inch, ready to fly. The pusher propeller was carved with a 1:1 pitch/diameter ratio. Mike reports the glide is spectacular.

The attached photo has been taken from Model Aviation (September 2007), the official publication of the Academy of Model Aeronautics. The publication on this newsletter has been authorized by Rob Kurek, Director of AMA Publications.

Ferdi Gale (AMA Member)  
Baveno, VB ITALY



*(ed. – This is very nice looking replica of the Boeing design. For you free flight enthusiasts this looks like something you need for your fleet.)*

November 12, 2007

*(ed. – Since I have a 98 year old father who was flying until age 92, I thought this was particularly funny. Thanks to Chuck Bixel for forwarding the link.)*

"A 65 year old man went to the doctor for his Class II exam and the doctor was amazed at what good shape the guy was in.

The doctor asked, "To what do you attribute your good health?"

The old timer said, "I'm a pilot and that's why I'm in such good shape. I'm up well before daylight, climb all over the aircraft doing my pre-flight inspection, fly all day, etc."

The doctor said, "Well, I'm sure that helps, but there's got to be more to it. How old was your dad when he died?"

The old timer said, "Who said my dad's dead?"

The doctor said, "You mean you're 65 years old and your dad's still alive? How old is he?"

The old timer said, "He's 84 yrs old and, in fact, he

built and flies his own airplane!

He went flying with me this morning. That's why he's still alive... he's a pilot too!"

The doctor said, "Well, that's great, but I'm sure there's more to it. How about your dad's dad? How old was he when he died?"

The old timer said, "Who said my grandpa's dead?"

The doctor said, "You mean your dad is 84 years old and his father is still living?! How old is he?"

The old timer said, "Grandpa is 102 years old and he was a pilot too."

The doctor was getting frustrated at this point and said, "I guess he went flying with you this morning too?"

The old timer said, "No...Grandpa couldn't go this morning because he just got married and he's on his honeymoon."

The doctor said in amazement, "Got married?!! Why would a 102-year-old guy want to get married?"

The old timer said, "Who said he wanted to?"

Whatever you do in life . . .

Have a GREAT Day doing it!!"

November 16, 2007

Hi Andy:

I am sending a minor contribution of mine, as I promised. Others will follow in due time. Best regards,

Ferdi Gale

(I built my first model plane in 1934).

## **CIR TAILLESS MOTORGLIDER**

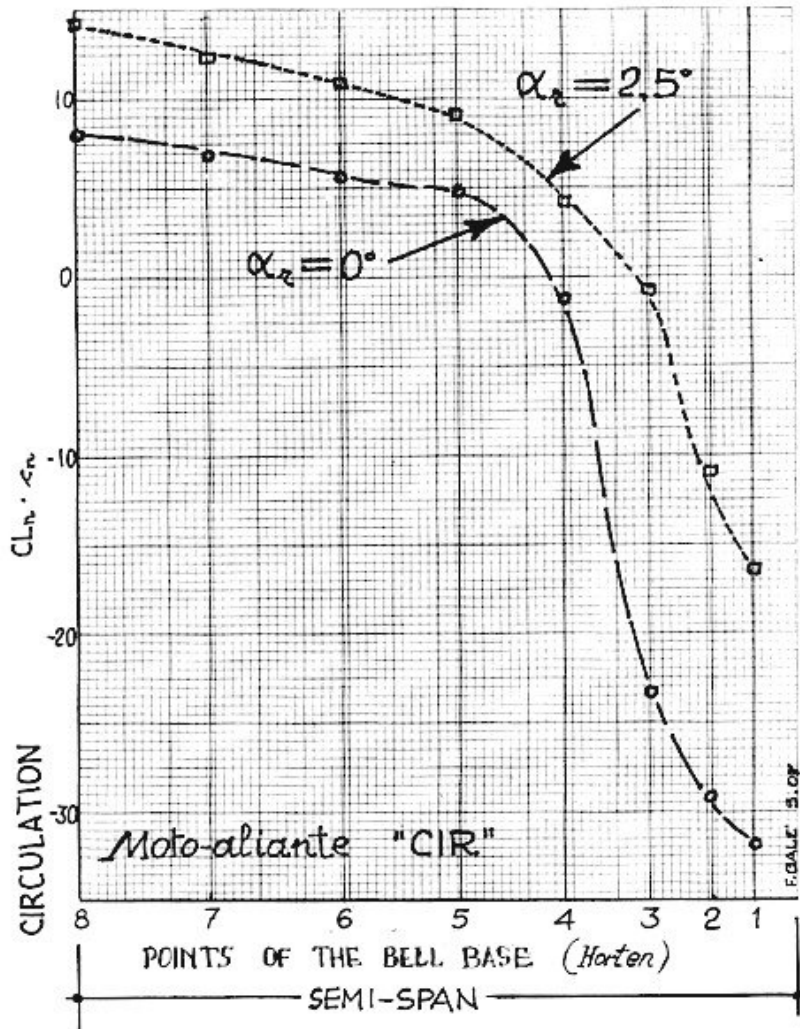
**T**ailless fans may be interested in this genuine Horten type motorglider designed and built by Alberto Dotti of Milan (Italy). This model is not a scaled down replica of a specific Horten sailplane but it has been designed according to the basic principles established by the late Dr. Reimar Horten as far as bell lift distribution, twist (geometric and aerodynamic), taper ratio (TRO,33) and minimized protuberances are concerned.

Tip end plates and lack of bat tail are the only (and minor) deviations from the Horten principles. The center of gravity CG is located 20 centimeters behind the nose of the root rib, while the geometric aerodynamic center AC is situated 5 centimeter behind CG.



The construction is almost entirely made with balsawood: the wing is divided in two for easy transportation; a method Alberto uses to carry the CIR in his rucksack while climbing the slopes of Val Badia, in the Dolomites.

I don't remember whether I have already sent you the enclosed pictures of two CIR tailless models. The red one (top photo below) has been built by Andrea Forcolin (Padua), the yellow one (lower photo) by Roberto Cozzi (Arluno, near Milan). This tailless is really an excellent flyer, without bad habits, according to the genuine Horten type design. Best regards,



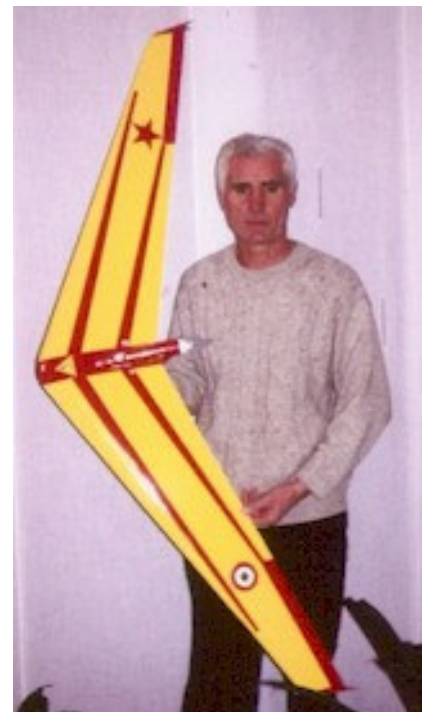
THE SHAPE OF THE BELL CHANGES ACCORDING TO THE ROOT INCIDENCE  $\alpha_r$

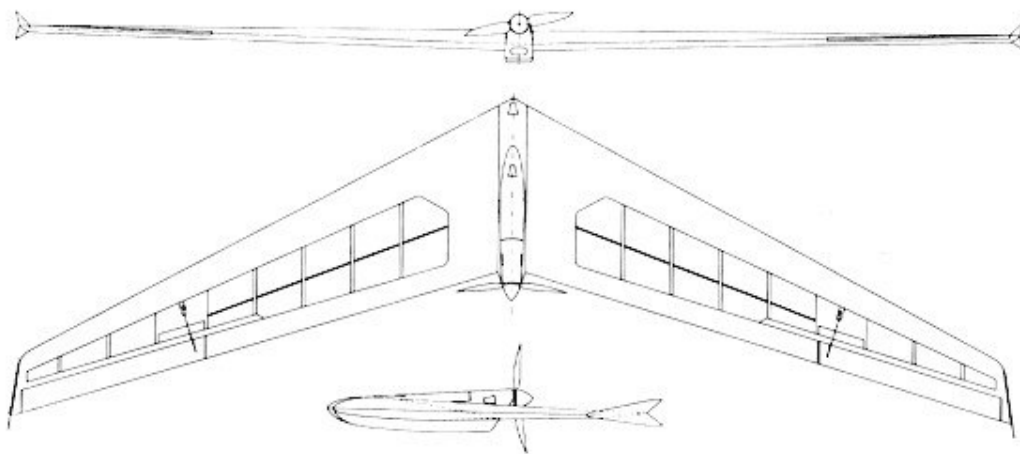
The graph of the bell distribution curve is here attached along with two pictures and a dimensional sketch with the basic statistics. A full size construction plan, with the ribs and other details is available with the issue 86 (March-April 2007) of the magazine MODELLISMO. Interested readers may contact stefaniaguid@rnlinc.it or send a fax to this Italian number 0765-26395. I don't know whether they take PayPal.

The flying results have been quite satisfying; at least another CIR has been built, while others are under construction.

Ferdi Gale,  
BAVENO VB ITALY

Ferdi





**CIR Electric Motor Glider** (by Alberto Dotti, Milan, ITALY )

Wing span	b=1600 mm	Root chord	270 mm
Aspect ratio	AR=8,88	Tip chord	90 mm
Wing area	S=28 dm <sup>2</sup>	Mean geom. chord	180 mm
Wing dihedral	δ=1°	Take off weight	680 g
Trailing edge sweep	θ=28°	Wing loading	24,3 g/dm <sup>2</sup>
Focal line sweep	φ=25°	Motor	SPEED 400
Airfoils: EH 2/12 (12%)			8 cells NiMH
	NACA 0012		



November 19, 2007

Mr. Hoey:

I have recently developed an interest in avian animal RC aircraft and found your article "Design and build an RC Bird Model" on *Model Airplane News* on-line. In your article you notate more information can be found in the "'Click Trip" URL at the end of this article'. There is no "click Trip" URL with the article found at

[http://findarticles.com/p/article/s/mi\\_qa3819/is\\_200206/ai\\_n9113847](http://findarticles.com/p/article/s/mi_qa3819/is_200206/ai_n9113847). Is this information still available and if so, where/how can I read/get hold of a copy?

Additionally, are any of your plans available whether for purchase or free? I am very interested in (what I think you call) your Raven. I refer to your aircraft on which the wings are designed to "tuck" back. I would like to start with this airframe and attempt to modify it with an ornithopter power plant and "flat plain" tail. When/if I get the design functionally finished, I would be more than happy to share a copy of my design with you in return

for yours (if you would be interested). Thank you very much for your time and consideration in advance!

Best regards,

Aric Benedict  
<benedict@csiheat.com>

Hello Aric:

The article I sent to MAN was a complete write-up. They chose to separate part of the info into an on-line "click trip" and didn't even include all of the photos.

I can send you the complete write-up that I submitted (first I have to find it!). The Raven model is the best flying of all of my birds, however the version with the wing tuck mechanism did NOT fly well, primarily because I changed airfoils, and removed the reflex feature. I do not have drawings for that airplane, but I can send you drawings of the base-line Raven model.

I always enjoy conversing with other bird model enthusiasts, so keep me posted on your activities. I have a couple of technical presentations (presented to the AIAA and SFTE) describing the theory and math behind some of my work. They are WORD files, so I can email them if you are interested.

Bob Hoey  
<bobh@antelecom.net>



Bob:

I will never understand abridgements of peoples work. I'm sorry to hear it wasn't an oversight in the publisher's part. You must have been bombarded with inquires like mine. Sorry to add to the pile.

A copy of the complete write up would be spectacular! Any advice/sketches/plans would be a welcome reduction in the projects time line, though I am slightly confused regarding the Raven plans however. You have since modified the design from the wing tuck to improve performance. There are no plans for either version, but you have drawings with general shape/dimension. Do I have that correct? Base-line drawings would be very appreciated, as would anything you wish to share. If it helps, my biggest curiosities are how you formed the head/neck, blended the body and tail and mitered the wing tips. I wish to enhance my project by adding little extras (like making the head "turn" with the ailerons, retractable feet "landing gear", etc.)

I have also read your 4-part post "Birds" on TWITT.org. It has offered confirmation on my thoughts regarding my current plan of using the flat tail for pitch and yaw. The more I look at the wing tip picture of your Vulture, the more I think I want to experiment with using something like them as ailerons as well, possibly even combining them with the tail rotation.

The "Design and build..." article notes "Detailed instructions for building the Turkey Vulture model accompany the full-size plan." Are those plans something you plan to include with your offer, or can obtain a set? Your Turkey Vulture would definitely address the above areas of interest.

I would LOVE to read your technical presentations! I'm actually a mechanical engineer by profession, hence kind of geeky in the fact I enjoy these type papers. They often spawn new avenues of thought. I use word practically every day so that format is great.

Thank you again for your generosity and time. It is very appreciated!

Aric

*(ed. – I wrote to Aric to let him know that Bob's presentation on some of his theories was available on VHS or DVD if he thought hearing it and seeing some of the slides would make his project easier.)*

November 30, 2007

I was looking about for any effort on a fixed wing aircraft to emulate a blimp in flight characteristics when I stumbled onto your site. Do these [Hang Gliding and the Ultralight Trike](http://members.aol.com/hiitec/kite/trike.html) (http://members.aol.com/hiitec/kite/trike.html) make the TWITT grade.



Barry Palmer, for [Sevtec](mailto:SEVTEC@aol.com) <SEVTEC@aol.com>

*(ed. – I told Barry that these hang gliders made the grade and that I would add this link to one our applicable pages when I get some time for editing newsletters.)*

December 2, 2007

Subject: Re: Kasper Wing - BKB

<http://www.astercity.net/~krisabc/BKB/Foto7-LAMINAT-pl.html>



Site Krzysztofa Waskiewicza

<http://kasperwing.com/new%20images%20from%20do-ruch.htm>

November 8, 2007



<http://kasperwing.com/Henryk,Krakow's.htm>

-pictures kasperwing.com



Our work with the K-Wing.

PS. do you have any info about BEKAS-N from California?

Henryk Doruch  
<Henryk.Doruch@ifj.edu.pl>

*(ed. – I will also add these links on the applicable Kasper page. I wrote back that I thought there might be a damage BEKAS in storage in Arizona. Henryk wrote back that: "Yes, this wing in Arizona is BEKAS-N. If anybody can find contact/location with this owner, it will be very helpful for us. We are searching for original/crashed/ Kasper wings. Your proposition of adding our links to the Kasper page is very nice.)*

**E**nclosed is \$20 for membership. I am interested in the BKB and two-place wings. I am a former propeller maker and presently a mold maker, and secretary for the local airport (W-23, Wild Rose).

Thanks,

Albert Ruediger  
Redgranite, WI

*(ed. – Welcome to TWITT. I hope you enjoy the next year's newsletters and those from past years. The past issues are available on the web site through the members only section. You can find the user ID and password in the left column of Page 1. One nice advantage of this method is that the pictures are in color since I do not gray scale them anymore.)*

November 11, 2007

**Y**our 306 article was very informative. The enclosed article shows the Boeing 390 series. This flying wing has a wing plan quite similar to the original ARUPs.

We have just completed a series of boom test runs of my LARA model based off the ARUP configuration. We are enthused enough by the results that we are building an R/C free flight model that is based on the knowledge and ideas generated by our runs.

If the R/C flights are successful we intend to complete the full size mock up to finalize structural and mechanical details. We hope to start on the full size flying prototype in May 08.

I appreciate TWITT greatly!!! You guys have provided us wing twits with much info and encouragement. Happy TWITTING!!

Jim Loyd  
Denver, CO

*(ed. – First, thanks to Jim for sending us this material. It is amazing what comes out of the archives when you publish something like the 306 article. Jim suggested trying to find a copy of Airpower, July 2002 on line to get copies of the pictures included in the article he sent along. Although I didn't find the magazine, I was able to find the author's original lead drawing at [http://www.aerofiles.com/\\_boe.html](http://www.aerofiles.com/_boe.html) and it is shown below.*



Digital rendering by Jared Zichek based on Boeing original documents.



At

[http://findarticles.com/p/articles/mi\\_go2547/is\\_200207/ai\\_n7074878](http://findarticles.com/p/articles/mi_go2547/is_200207/ai_n7074878)

*I found the lead-in paragraph of the article with a link where it can be purchased. The lead-in was:*

“In early 1943, Boeing attempted to interest the Navy in three highly unconventional aircraft projects: the Model 390 and 391 low aspect ratio all-wing pursuits and the Model 396 low aspect ratio all-wing testbed. At the time, Boeing had not built a fighter for the Navy since the XF7B-1 of 1934, a derivative of the famous P-26 "Peashooter" which failed to earn a production contract. During the intervening period, Boeing successfully focused on the development of multiengine transports and bombers while losing ground to rival manufacturers in the fighter business. Boeing never abandoned the fighter though, submitting scores of designs to the Army and Navy throughout World War II. Among these, the Model 390, 391 and 396 were among the most radical.”

Then at

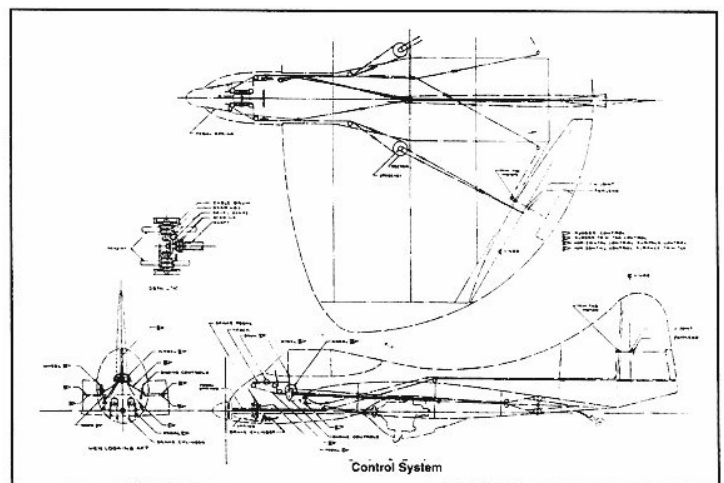
<http://www.geocities.com/krasira/bigph1/b390-epstein.htm>

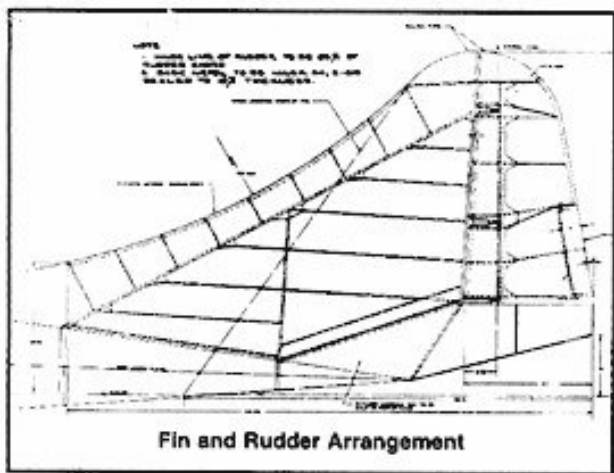
*I found a couple of pictures of models that were built of this design by Mr. Epstein. These are shown in the top right column.*

*There were also a couple of sites where you could buy plastic models, like from Revell, so you can have one on your model shelf if low aspect ratio wings are your thing. Although I didn't proceed any further with the research, I imagine you can find more information on the 391 and 396 series of proposals.)*

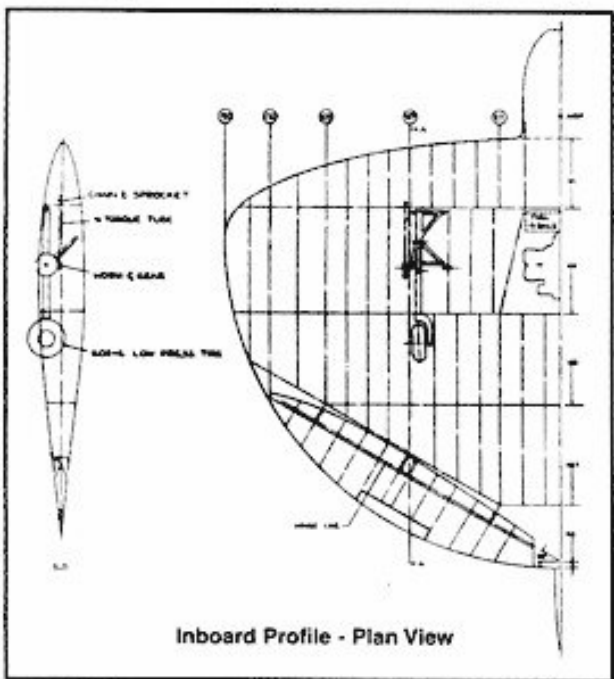


*Below are a couple of the line drawings from the Airpower article.*





The following are original detail drawings of the internal construction of the Model 396. As can be seen, the aircraft was quite simple in design, almost crude in some areas.



The following came for the U-2 Bulletin Board group.

December 2, 2007

**U-2 For Sale**

It is with great regret that I share with this group that Tom Rose, owner of "Tom's" U-2, is in the final stages of cancer. I had an agreement with Tom to build his kit from the 1980's, in exchange for a contribution to the building fund of my church. Now, Tom has authorized me to sell the uncompleted project, with proceeds to go to the above fund.

The aircraft is located in Topeka, Kansas.

The aircraft is built per plans, with the best workmanship I could deliver. Material is Douglas Spruce.

Included are: Wings, Elevons, Rudders---complete, covered but not rib-stitched or taped and with no paint. Fuselage and rear belly fairing built and covered but no paint. Center section is uncovered, but fabric and chemicals for cover are included. Fuselage has been modified from plans, with a welded steel truss that carries landing gear (see pictures). Gear has been moved from wings per discussion in this group. Seat is mounted. Fan cooled, pull-start Rotax 277 w. 3-blade pusher prop included. Engine and prop removed from pusher ultralight, hours unknown. The kit bubble canopy will go with it, but fuselage has been modified to take a flat-wrap canopy, not included. Outer panels have been mounted and all controls have been fabricated, hooked up and adjusted.

Left to do: Complete and mount canopy. Purchase & mount instruments. Determine location of engine for proper CG, and fabricate mount. Design and construct turtledeck/cowling once engine is mounted. Cover center section. Purchase and apply finishing chemicals. Fabricate and mount tank. Devise and connect engine controls.



Left to purchase: Finishing paint and chemicals. Canopy and mounting hardware. Instruments.

Pictures of the project are in the album "Tom's U-2".

We want this aircraft to go to someone who can appreciate it.



Dave Gingerich  
<dgingerich@cox.net>

November 12, 2007

I am an 'old' pilot but new to the flying wing scene. I worked my way through all the postings on this site and want to thank you all for making this such a good support system.

This enthused me so much that I have ordered the US plans from US Pacific. This is where I need some input. I cannot seem to get hold of them for some time now. Were they affected by those fires in CA?

Can anyone advise me please?

Thanks

Franz  
New Zealand  
<reinecke@yahoo.com>

*(ed. – Richard Avalon has had some recent medical challenges but has indicated he is on the way back. He is a member of TWITT so when he sees this perhaps he can respond to Franz.)*

**The following came from the Nurflugel Bulletin group.**

November 21, 2007

BWB Links

Getting back to a topic more akin to a Nurflugel, a couple of links that might be of interest:

<http://www.aoe.vt.edu/research/groups/bwb/>

<http://www.secretprojects.co.uk/forum/index.php/topic,282.0.html>

<http://www.up-ship.com/eAPR/ev1n3.htm>

Enjoy the Day!

Mark Nankivil  
<nankivil@covad.net >

What's the point of the large amount of engines variant?

Doug Holverson  
<dholverson@cox.net >

In reading thru a couple of the pdfs, the basis of the idea is that Kuchemann theorized there were propulsive efficiencies to be made with such a layout by essentially filling in the wake of the aircraft. It is also suggested that deflecting the engine outflow can be used pitch control.

Mark

The caption mentioned STOL advantages. Flows in an accelerating gradient tend to stay laminar and attached. The dispersed intakes make an accelerating (attached) gradient all the way back to their gaping maws, even at high angles of attack (high lift), as compared to the unaided wing, where flows start to slow at about the thick point of the wing (which is why laminar wings have their thick point well aft). That's the principle the Custer channel wings tried to use, though with just two props.

Also, the velocity of the flows over the wing is increased, as compared to an unaided wing, so whether by Bernoulli speed versus pressure, or (better) by Euler centrifuging of low pressure, lift goes up.

The same thing could be done with multiple brush less motors above a small, low speed passenger plane wing, for STOL, powered by a generator, perhaps also as a safety supplement to the main engine. At first glance the power transmission inefficiencies of engine to generator to electric motor to props seems impractical. But there are a couple more offsetting advantages, aside from putting flows where you want them for STOL: First, lots of props would allow the low speed efficiencies of large total prop area.

(Remember, twin 8' props were what allowed the Wrights to get their 1903 flyer off the ground, with only 12 horsepower). And second, the engine and generator could be located inside the fuse, rather than



on propeller shafts, for much lower interference drag than twin (etc.) engines mounted in wings.

The question, of course, is whether the flexibility of decoupling engine location from prop location can, in some circumstances, compensate for losing the power efficiencies of direct drive.

Philip Randolph  
<amphioxus.philip@gmail.com>

**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

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

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