No. 215 MAY 2004

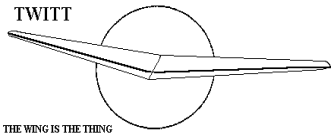
# T.W.I.T.T. NEWSLETTER

NOT SURE WHERE THIS PHOTO ORIGINATED, BUT IT LOOKS LIKE THE LOCATION IS PROBABLY ONE OF THE EAA OSHKOSH EVENTS. THESE ARE DELTA DYKE WINGS ON DISPLAY. SEE PAGE 8 FOR MORE DISCUSSION ON DELTA DESIGNS.

**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., **0405** means this is your last issue unless renewed.

**Next TWITT meeting: Saturday, May 15, 2004, 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** |
| **Secretary:** | **Phillip Burgers** | **(619) 279-7901** |
| **Treasurer:** | **Bob Fronius** | **(619) 224-1497** |
| **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) 596-2518 (10am-5:30pm, PST)**
**(619) 224-1497 (after 7pm, PST)**
**E-Mail: twitt@pobox.com**
**Internet: http://www.twitt.org**
Members only section: ID – **twittmbr**
Password – **member02**

Subscription Rates: $20 per year (US)
$30 per year (Foreign)

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

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

**Foreign mailings: $0.75 each plus postage**

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



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).

## TABLE OF CONTENTS



## PRESIDENT'S CORNER

All I can do is apologize again for not having a program for you this month. It is difficult when you find someone, initiate contact and then don't get any replies, even when giving plenty of notice for the proposed meeting date. I really had my hopes up that we were going to have a good presentation for you, but as you see from the program announcement it isn't going to happen. We will get to work again and see if we can come up with something for the July meeting since this is also our traditional anniversary party and we want to have everyone there.

I did get a couple of letters during the month, but not enough to make a good section of TWITT related items. So, as I have done in the past, I extracted what I thought might be interesting pieces from the Nurflugel bulletin board and included them for your reading. I know some of you are members of the bulletin board so this is old reading for you. But we also have a lot of members who do not have electronic access to the Internet world, so this enables them to see what is out there.

I ask all of you to take a few minutes and write to us and give a little run down on what you have been doing with one of your projects. It doesn't have to be fancy or long, and a couple of pictures would help in directing everyone's attention to the key issues. This would be especially good if you are looking for an answer to a pesky problem in your design, either actual or formulative. This is your newsletter for sharing information, so don't hesitate to contribute.

Andy

## MAY 15, 2004 PROGRAM

I sure wish I could tell you we have a program for May, but that is not the case. All the leads we followed ended up as dead-ends for May, but we might be able to get one of them for the July anniversary meeting. We will keep trying to find someone who can talk about some facet of aviation, construction, design, etc.

As I have said in the past, if you run across someone in the southern California area who you think would make a good speaker or has something of interest to pass along, please give us the contact information so we can pursue it.

We will be at the hanger on the 15th if you still want to just drop by and chew the fat with anyone who happens to be there for the same reason. It always good to see all of you, so come on by.

---

## LETTERS TO THE EDITOR

April 19, 2004

TWITT:

Enclosed is a check for two years for the great TWITT publication. Also an e-mail is coming along with some pictures.

Also, for those interested, please join the Mitchell Wing Builders Yahoo chat group. There is a lot of pictures and wing building information. The address is:

http://groups.yahoo.com/group/U-2 wing/ (make sure to use a capital "U")

Join now and put the site in your favorites.

Thanks,

Richard Avalon
U.S. Pacific
mitchellwing@earthlink.net
http://home.earthlink.net/~mitchellwing/

*(ed. – These types of chat groups or bulletin boards can often be very interesting and offer a lot of good information, as you have seen from the Nurflugel samples in this and other newsletter. However, I must warn you that there is also a lot of not so useful or relevant information that often creeps in. Unless you like to actually participate as the messages are created, I suggest you sign up for the digest version and get one e-mail at the end of the day with all the activity.)*

---

April 19, 2004

TWITT:

Please find enclosed my subscription rate for the next year.

Since I have changed my job there is no time left for my hobby "flying wings". It will be interesting then to see what has happened in the meantime.

Greetings,

Reinhold Stadler
Karlsfeld, Germany

*(ed. – We wish you well in your new job. I did the job change thing last year and it has been working out so much better than my old job. I hope you have the same experience.*

*Enjoy the information we provide while you are away from your hobby.)*

---

April 30, 2004

TWITT:

Interesting web site!

I've been an RC model flyer for many years although my current main interest is in flying wings. To date I have designed a number of wings.

My first wings were similar to a Zagi but with thinner section, higher aspect ratio, more sweep and of built up construction with Solartex covering. The first had a 55 inch span which flies very well (usually better than Zagis) in winds of 5 to 40 mph (with pb) and the second was the same but 1 1/2 times bigger. Both fly from the slope and are very stable although the larger one is more slow to control. The second one has also been fitted with 2x 650 electric motors with some success (after a couple of crashes)

The latest wing shown in the attached photo is 75-inch span, built up with balsa skin, which is covered in glass and epoxy, which gives a much better finish. It is much higher aspect ratio than the other wings. Section is semi symmetrical around 10% thick with a small amount of increasing reflex towards tip. First flight was good although I there was a little yaw oscillation in

gusty conditions and when stalled it stopped and descended flat but with no damage. I moved CG forward 1/4 inch to get better stall behavior. So far I have done 2 more flights and It seems to fly very well. I intend to fit ballast when lift is good and I think it will be quite fast.

I am also building a 12 1/2 feet span scale Northrop XB 35 with electric power. This has no fins but the propellers will give some directional stability. It also has split tip draggers for yaw control. If I have problems I may fit a gyro on these to stabilize it. Gyros are a good way to stabilize a model. I have had tried them on ailerons and they work well.

You may also be interested to Know that I have access to some original Horton blue prints (cant remember the model but it is a powered plane with a pusher prop) which I obtained through a colleague of mine at Airbus where I work in the UK. He also knows an old guy who used to fly Hortens

Best Regards

Peter Evans
petersevans@dsl.pipex.com

*(ed. – I have written back to Peter to see if we can get more information on the Horten plans he talked about. I will fill you in when I get a reply.*

*Here is the picture that Peter sent along. Nice, quick looking wing.)*

---

May 2, 2004

Hi Andy,

Latest news from the workshop. I now have a straight taper wing in progress. The center section is gull winged and uses laid up carbon spars and built on a purpose built board. Note the method of removal!

The wings are built around dual carbon fiber tubes onto which the ribs are slid. The ribs have been rescaled so that although they are perpendicular to the spars they still present the correct airfoil section to the airflow. This saves having to drill the locating hoes in the ribs at an angle and therefore makes for a more accurate construction.

This project is a rebuild of a similar model, which suffered from fatal adverse yaw. I *think* this was due to the flat plate tips that were employed. This time I have opted for lifting section (same as wing) tips that are toed-in by 3 degrees. I have designed the tips to be removable so that if they don't work I can replace them with a central fin.

**SUPAMAN**

| | |
|---|---|
| Wing type: | Three piece rear swept gull wing |
| Wingspan: | 2.8m |
| Section: | EMX07 |
| Root chord: | 475mm |
| Tip chord: | 150mm |
| Spars: | Centre panel: Laid up carbon tows. |
| Outer panels: | Dual carbon tubes. |
| Sheeting: | Partial |
| Controls: | Outboard elevons |

Peter White
<sharon.ludderyhill@lineone.net>

*(ed. – Peter said he would forward us more on this design once he has successfully flown it. We certainly will look forward to it.)*

---

*(ed. – Here are some of the threads from the last Nurflugel digest messages. These are unedited.)*

**Subject: Profili 2 new release 2.15**

I know that many of you already knows it, but it is well worth to know that Dr. Stefano Duranti has released version 2.15 of his world-known program Profili 2 (www.profili2.com). A lot could be said about it, but suffice to say that a complete wing panels management feature has been added now to the Professional version, while evaluation of such capabilities is 'tastable' in the freeeware one. And if I say 'complete' it IS complete ....

Even CNC compatible files can be issued now, and 'no limits' printouts are possible at last. Have a look. It's worth doing!
Ciao from Italy.

Tullio Bonfiglio – Chiavari (GE) – Italy
bonfiglio@aen.ansaldo.it
http://xoomer.virgilio.it/ocapofe/

---

**Subject: Bipes**

Is it true the a biplane can be made self stabilizing if the upper wing is set with 3° less angle of attack than the lower wing?

Doug Holverson
<dholverson@cox.net>

---

Check out
http://home.att.net/~dannysoar/oddities1.htm

<dannysoar@worldnet.att.net>

---

Not really, it also requires that the wings have varying degrees of washout and a good amount of sweepback. Take a look at the Dunne biplanes for a better understanding of the relationships.

Carlo Godel
<regiaero@acsol.net>

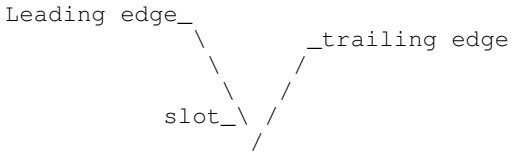
---

With (a lot of) stagger you don't need washout and sweepback; I built something like dannysoar's mystery tailless and it flew. On the other, where do you draw the line between a tailless bipe and a tandem :-)?

Torbjörn Molin
<tm@symsoft.se>

---

Think of it as reflex. The aft wing is the one that must have the smaller incidence. You could do it so the top wing was providing the balancing moment but it is more efficient for the bottom wing to trim the plane because there's the opportunity for some favorable interference between the wings with the stager set up as in this wonderful drawing.



This is the way that that neat little pusher and the Tern on dannysoar's site are set up. It's also how the Flying Fleas work except that the top wing can pivot and change the slot geometry. Slot geometry can be very critical and that is what caused the bad reputation of the early Fleas.

Norm Masters
http://users.acsol.net/~nmasters/

*(ed. – Norm's new address and phone number are: 875 Main Apt. 512, Grand Junction, CO 81501, 970-257-1809.)*

---

Dealing with standard bipes, some of this interference also translated into drag, thus most increased rather than reducing the spacing.

Just as an aside, while at Mississippi State about 1960, we developed a cuff type LE mod for Stearman dusters that dropped the nose of the foil close to the tip of the lower wing, softening the stall with more warning and less wing drop.

The military had sharpened the stall/spin on the PT-17 series from previous trainers, not wanting to let students start out with numb habits.

Cheers,

Bob Storck
<bstorck@sprynet.com>

---

Carlo-

The device on my website is an excellent flyer & comfort plane. I lost my last one OOS competing in an 20" stick event.. It had no sweep back and either no or little washout.

<dannysoar@worldnet.att.net>

---

This is THE problem Tor, determining what is a tandem and what is a wing only, our club determined that any stagger along the line of flight constituted a tandem and not a tailless, the washout and sweep can make a monoplane stable but not over a large variation of speeds without large areas of control surface. The Dunne tailless aircraft have no stagger nor does the Icarus glider that is a copy of the Dunne biplane. Another question arises and that is "is a delta a tailless aircraft?" in some circles it is and some others it is not, one must be very careful of his definitions lest he become totally mired in semantics.

Carlo

---

Yes, Bob, biplanes usually do pay a drag penalty compared to monoplanes designed for the same mission. However if one loosens his definition of biplanes to include sesquiplanes with lots of stagger and a very small interplane gap (say about 4% of the chord of the top wing) like this



Then the two-wing system can have the same drag as the top wing alone (even less in a narrow speed range). Granted with these proportions it's a multi-element airfoil but I have come to think of "standard bipes" as airplanes with poorly designed multi-element airfoils i.e. the elements are close enough together to interfere but positioned and sized in such a way that the interference is usually unfavorable.

Norm

---

I didn't want to wander too far, but isn't one of the drawbacks of multi-element foils (thus sesqui planes, etc) the very narrow speed range, usually in the low end of the band? I admire the benefits of the underused Junkers type controls, but appreciate their limitations, for example.

Bob Storck

---

I personally consider them tandem wings and as I said in a previous post semantics is everything....

Carlo

---

If the elements and slot geometry are fixed then, yes, the drag will be higher than need be but if they are movable e. g. Junkers flaps and Handley-page slats the speed rang can be broadened drastically over what you could get from a single element airfoil with a plain flap. Yes, if you cut a slot in any airfoil, the solid version will have slightly lower minimum drag. However CDmin is only one design point and what we should be comparing are "envelope polars". If the individual airfoil elements are articulated the resulting wing can have a wider envelope than

unslotted wing. Look at the STOL kit planes like Zenithair and Savannah:

http://www.zenithair.com/stolch801/design-wing.html
http://www.skykits.com/

A few months ago I wrote an article about Junkers flaps for the TWITT newsletter. I did quite a bit of research for it and most of the source material is available on line so I made the bibliography into a little web page:

http://users.acsol.net/~nmasters/External_airfoil_flaps.htm

The references are mostly PDFs from NACA LARK (well over 100 pages). What it all boils down to is that the pressure field of the small aft airfoil modifies the pressure gradient on the large forward airfoil in such a way as to reduce drag and increase lift. This reduction of the main wing's drag is almost equal to the drag of the small wing and the difference is where the increased CDmin of the slotted airfoil comes from.

My article is a lot easier to read than the NACA reports. Ok so I left a lot of stuff out but I think it covers the gist of the issue. If anybody would like to read it send me your street address privately and I'll mail you a hard copy.

Norm

---

Great research, and I agree completely. I reacted mainly to essentially fixed multi-element units.

Bob Storck

---

Carlo:

Ok, so by that definition, the Wright Flyer is not a tandem, but a Jenny, a Stearman, a Jungmeister, a Tiger Moth, ad infinitum, are all tandem-wing three-surface aircraft! Seems like a possible case of an overly rigid definition here.

Yes, Carlo, you're absolutely right, it's all in the semantics. Of course the words "semantics" and "absolutely" are two words that should be used together only with extreme caution!

There's an article in the "Ask Joe and Don" section of our website where I point out that in their most fundamental terms, there is no difference between a conventional tail (i.e.: aft-mounted, so therefore in this case I'm also including V-tails, T-tails, cruciform tails, etc.), a tandem wing, a tail-less biplane, or a canard layout. All are examples of two-surface aircraft layouts. The only variation is in the relative sizes of the surfaces and their relative horizontal and vertical locations.

By that same reasoning, a conventional biplane, as well as things like the Piaggio Avante (with its canard plus aft-mounted T-tail) are all three-surface aircraft.

Pursuing this line of reasoning a little further, we could also safely state that a plank layout or forward-swept layout (a-la Marske, Backstrom or Fauvel) flying wing is nothing more than a conventional wing plus an aft-mounted tail, where the tail moment arm is such that the leading edge of the horizontal tail coincides with the trailing edge of the wing. For that matter, a swept flying wing (such as Horten or Northrop examples) is nothing more than an aft-tailed conventional layout, but with the wing sweep such that its tips coincide with the longitudinal location of the horizontal tail, and with the horizontal tail split in two and the pieces grafted onto the tips of the wing.

In fact, that entire philosophical approach can be used as the basis for some surprisingly good rough estimates of things like performance, C/G location and stability, using conventional tail methods.

I guess in the end, they're all just airplanes!

Don Stackhouse @ DJ Aerotech
djaerotech@erinet.com
http://www.djaerotech.com

---

I have been designing and flying tailless model aircraft since 1950 when I built a Skyray for Jetex power in the intervening years I have learned much about the dynamics of tailless aircraft. One is that they are not tailless or more likely the tailed aircraft fly in the same manner as tailless, (tailless meaning without secondary or tertiary horizontal surfaces) they all balance at 20% of the mean effective chord in order to fly with pitch stability. So I have been designing my models with this in mind and having excellent results as a consequence. After all there are few here who have out flown Barney Wainfan in flying wing contests and I have. As you say Don A wing is a Wing is a Wing and that is the part that flies. Having far too much fun with models because you can always walk away from the crash.

Carlo

---

What I'm trying to do is an improvement on this:

http://www.dars.org/jimz/eirp_21.htm

Doug Holverson

---

Ah, but I've seen an engineering analysis done of the Wright flyer and it determined that the lower wing was 3/4" or so ahead of the top wing . . .

Let's not get into nitpicking details. Let's just address and enjoy all the variety.

In my museum and historical pursuits, I've learned to fiercely avoid terms like first, fastest, highest, only, and above all, best. I'll leave those to PR people*, mindless nationalists, and single-minded advocates. Throw in enough assumptions, curious logic and qualifiers, and you can make a case for anything . . . at least in your own mind.

Bob Storck

---

The trimming problems with something as exciting as a rocket powered model are different than the ones associated with a rubber powered airplane set up for a long gentle motor run.

Here's all I think I know. Pretty much all free flight contraptions need some sort of lateral dihedral for stability in pitch. Free Flights call this incidence and so will I. This is assuming that you can count the reflex in planks as incidence.

There is a trade-off between lots of incidence and stability and not much incidence and a better L/D.

The problem with lots of incidence is that as the speed goes up so does the nose. Nickel hand launch gliders, with vast amounts of incidence, trimmed for glide will loop if you throw them hard.

So serious hand launch gliders have very little incidence. The standard cure for this in rubber-powered airplanes is to adjust the thrust line to create a moment that equals the ill effects of the incidence. There are other things you can do that involve putting the climbing model in a turn,

Perhaps this note will produce an outraged response from someone who knows what he is talking about

David

<dannysoar@worldnet.att.net>

---

**Subject: Baker MB-1 Delta Kitten**

I wonder if someone has some more info regarding this unusual little homebuilt delta wing:

http://www.infinetivity.com/~rrhoyt/EAA25/NewsLeters/archive/tech-form/myst512/nl5dec_b.html

I am also looking for more information on the Payen PA 49 KATY.

http://museedelta.free.fr/payen/pa_49.htm

Hakan Langebro
<hlangebro@hotmail.com>

---

I remember seeing it and a Dyke Delta fly many moons ago at an air show. The take off roll might be listed as 500 ' but if I remember correctly it used much more than that, the Dyke delta used a lot also, maybe 2000' or so.

Albert Robinson
<arobins1@midsouth.rr.com>

---

Hakan-

The Baker delta was built around here in Ohio (Huron, I think, but was destroyed in a fatal crash on approach to the Mansfield, Ohio airport before I was active in archiving/researching tailless aircraft. I do not remember what the tower guys told me when I worked there, but I THINK they said he had engine failure and went in short of the airport. It was a well-known homebuilt, for which Marion Baker sold plans.

I have the following articles:

Marion Baker's MB-1 "Delta Kitten":

"Baker's Delta"; American Modeler; 12/60; pp.20-21, 50-51 (6 paragraphs, 8 photos)

Baker, Marion; "The Story of My Delta-Winged Airplane", Sport Aviation (EAA); 1/62; cover, pp.4-6 (9 photos)

MB-1 Specifications; Fun Flying Guide (1971 magazine format); p.90.

MB-1 photo; EAA Aircraft Design, Vol.1; ca. 1960's; p.53

Vigneron, Phillipe; 3-View on 8.5" x 11" paper

**********

Payen PA-49 "Katy":

photo; The Aeroplane; 12/18/53 (original)

2 photos; The Aeroplane; 3/12/54 (photo copy)

"The Payen PA. 49"; Jane's ATWA; 1955-6; p.155 (3 parag., 3-V, photo, specs)(photocopy)

Photo; The Aeroplane; 6/10/55 (distorted photocopy)

"Aircraft at the Salon"; The Aeroplane; 6/17/55; pp.814 (2 short paragraphs), 816 (small photo)(photocopy)

"Payen"; Acft. Engineering; 8/55; pp.242-3 (1 photo, 1 short par.) (photocopy)

"The Payen Pa. 49/B Katy"; Jane's ATWA; 1957-8; p. 162 (3 par., specs, 1 photocopy)

photo; Air Progress; 7/72; p.14 (brief mention in paragraph about new Payen Pa-61F) (original)

"Payen Pa.71" and "Payen Pa.149"; Janes ATWA; 1973-4 p. 76 (each: 3V, 3 par., specs; these are related derivatives)

Three computer printed images of PA .49 in Museum.

"Le Payen Pa 49 'Katy'"; Le Fana de l'Aviation; 9/92; cover; pp.44-55 (painting, 2 drawings, 19 photos, page of scale drawings: 4V, 3V, loftings) (photocopy)

Pelletier, Alain; "Paper Darts to Deltas- The Designs of Roland Payen"; Air Enthusiast; 3-4/97; pp.33-44 (Pa.49 on pp.40-41 with Pa. 149 and Pa.71 mentioned and shown later; Pa.49 material: 6 photos, 3V, 3 paragraphs) (original article)

Let me know what you need.

Serge Krauss
<skrauss@ameritech.net>

---

Regarding the Payen designs I could provide 3(5)-views of the PA.49,PA.48/3 ,PA.59 and the PA.61F,as well as drawings/photos from J.Cunies "Les Avions Des Combat Francais" (PA.48 and PA.59) and quite a number of photos of the PA.49 from various sources and 3 photos of the PA.61, I've searched for quite a long time.I would be very glad to get photos or drawings of other types,not mentioned above, for example the other PA.61 variants, or the PA.149 and 71.

Jens Baganz
A_J.Baganz@t-online.de

---

April 18, 2004

Subject: 16. International Flugzeugveteranen Teileborse, Speyer, Germany. 17 April 04

I would like to personally thank Peter Seelinger for another fine 'Vintage Aircraft Parts sale' which took place over the last two days at the Technik Museum in Speyer (southern Germany). The weather was perfect there was a great turn out and Speyer was looking its Spring best. Deep regrets at having to leave so early to fly back to England.

Looking forward to the 18th Borse in September 2004.

Danke Peter

John D Artis./JME Aviation. England.
milartjj@aol.com

---

**Subject: New Kind Of Prop Introduced**

I made a page about the TAM-90. Accidentally I came in contact with the designers of this prop. It was already been tested in boats and in table-fans. I proposed to test it on a ultralight. The designer made a tailor-sized prop and sent it to a contact of mine in Montpezat (South of France). The annual Pou du Ciel meeting will happen there on 19 June and I hope that the prop will be mounted in time to be tested to proof its claims (low cost and less noise). I will report the tests because I am sure that you will be interested in the TAM-90 once it has proofed itself.
Oh yes, nearly forgot. Go see:

http://users.skynet.be/nestofdragons/tam.htm or
http://users.skynet.be/nestofdragons/new.htm

(if you would like to see my other recent work, lot of Delanne stuff)

Keep that brain spawning wings,

Koen Van de Kerckhove
<nestofdragons@hotmail.com>

---

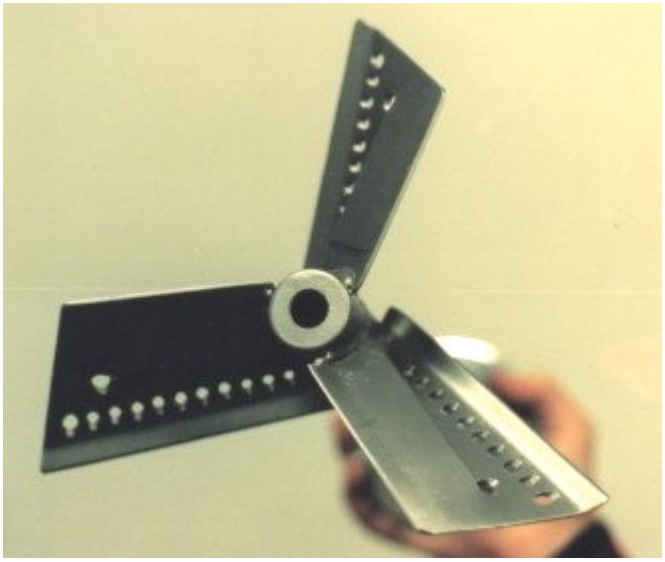
A few words of advice:

1. Insist on a full endurance test on the ground (such as the 150 hour ground test run required for certification of new prop hub designs per the FAR's and JAR's) before you agree to fly that thing. Try to be somewhere else (a few countries distant from the test site if possible) during the test.

2. In any case, don't let yourself (or anyone else) be caught dead standing anywhere near the plane of the prop disk or slightly ahead of the disk when there is any chance that it might be turning. Failure to follow this advice could very well result in someone actually being caught dead (for real!) in that location!

---

***(ed. – These pictures were taken from the website cited by Koen.)***



*(permission granted to use picture by Tahsin)*

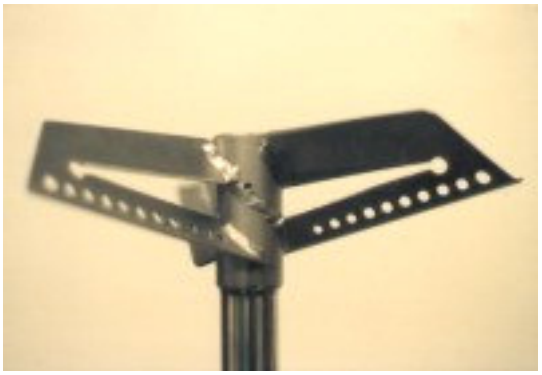
*Instead of a complex curved propeller, the TAM-90 uses blades from straight plates. Less complex, less costs. (permission granted to use picture by Tahsin)*

---

3. A thorough strain gauge and vibrations survey test would really be nice. BEFORE flight. Using that same type of engine that the prop will be flown with. For that matter, a fatigue test of the blade roots and hub would also be a very wise move.

4. Speaking as someone who spent over a decade as head of R&D for a major propeller company, and who knows just a little about propellers, any valid basis for the claims made for this prop are not immediately obvious to me, other than maybe the low cost, and even that isn't a "sure deal". It would be nice to see some actual scientific justification and test results.

---



*A three bladed propeller (permission granted to use picture by Tahsin)*

---

5. If someone somehow does talk you into flying this thing, make sure that no parts of the pilot or critical parts of the plane are anywhere near the plane of the disk or in front of it. Also, make absolutely certain that you have a very strong steel safety cable holding the engine to the airframe. The loss of a major part of a blade (and I would expect those blades to fail just

outboard of the welds at the hub) typically results in yanking the engine off of its mounts. It's scary enough to make a forced landing after that has happened, but if the problem is compounded by the aft C/G caused by the engine having fallen completely off of the airplane, the plane will probably be violently unstable in pitch (and possibly yaw as well) and totally unflyable. Also, the departing engine could go through Heaven-knows-what other parts of the airframe on its way out, resulting in all sorts of damage to other things. If it doesn't leave completely, it might still end up hanging way off to one side, causing asymmetric drag that could be more than the rudder / elevator /ailerons can overpower. At the very least, the glide ratio is likely to make the Space Shuttle's look good.

6. With all of the above in mind, also make sure the airplane has a good ballistic parachute installed and in excellent working order.

One of my jobs in that previous career in the propeller business was doing FMECA (Failure Modes and Effects Criticality) analysis of new prop concepts, as well as structural analysis and testing of new propeller structural designs. As part of that, I also kept in close, almost daily contact with the person in charge of accident investigations for that company, a former test pilot and accepted expert on propeller investigation (he used to conduct training courses for the NTSB investigators on how to analyze propeller forensic data in aircraft crashes). I learned a great deal about what things can break, how and why they break, and what happens to the airplane and the people aboard when they do.

Speaking from that background, I'd have to say that those pictures I just saw on your website are some of the most frightening I've ever seen anywhere. Proceed with EXTREME caution.

Koen, you've been an active contributor to this group for quite some time now, and I admire your enthusiasm. Be careful with this one, we'd hate to lose you.

Don Stackhouse @ DJ Aerotech
djaerotech@erinet.com
http://www.djaerotech.com

---

Would someone please educate me on just how this prop would work. I can see that it appears to be a kind of joined wing, but am uncertain how well this would work as a propeller. I would guess that the boat prop version might work alright, as I think that there is minimal need for and airfoil (hydrofoil) shape to work in an incompressible fluid. (No offense intended, but) To my eye, that paddle attached to the snow-mobile engine would do little more than thrash the air and provide a load to keep the engine from over speeding. Do those holes just behind the leading edge provide some kind of vortex generation, ?slot lift? or what? I may be totally wrong, as I have no formal education in aerodynamics/hydrodynamics. I am just an aviation enthusiast and avid R/C modeler.

I second Don Stackhouse's concerns. I place a great deal of faith and trust in his insight and understanding of a good variety of disciplines. I consume with entertainment and education his every word that he is so kind to share with us all. No, I am not an engineer, but do have a reasonable seat of the pants understanding garnered from my parents - both of whom held Bachelors degrees in Mechanical Engineering.

I just had to ask;

J.P. "wingsounds13"
<aeronut@comcast.net>

---

No no, it was not intended as a Aprils fool gag. They really try to get this prop tested in all possible fields where it can be used. It was myself who suggested the ultralight airplanes. OK, I am definitely not a prop-guy. I just know the meaning of the word "step". and that's all.

But I was thinking. Man, if it truly is right that these props can lower the noise being produced by props, it is a true winners item for the ultralights. They were always named as flying lawnmowers. If they can get less noisy. They will be less disturbing. And that was the origin of my enthusiasm about this prop.

OK, still not a true airfoil prop and yes ... welded. But lets just test it and see what happens. And thank you Don, for guiding me towards ground-tests. Yes, I truly think that those are needed to prove the prop will not dismount itself in the air.

Well, I keep you informed about it.

By the way, the prop being sent to France by its manufacturer was not the right size and was not balanced. It seemed that they sent a old prop instead of a newly made one. I am trying to find out what went wrong. Communication can be one of the reasons. I speak normally Dutch, but I write in my style of English to the designer and I write in my French to the French tester. The designer is Swedish and tries his best in English. Misunderstanding can quickly happen.

Koen

**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

---

**Personal Aircraft Drag Reduction,** by Bruce Carmichael.

**Soft** cover, 81/2 by 11, 220 page, 195 illustrations, 230 references. Laminar flow history, detailed data and, drag minimization methods. Unique data on laminar bodies, wings, tails. Practical problems and solutions and, drag calculations for 100HP 300mph aircraft. 3d printing. $25 post paid.

Bruce Carmichael brucecar1@juno.com
34795 Camino Capistrano
Capistrano Beach, CA 92624 (949) 496-5191

## 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 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.

Cost: $10.00 postage paid
Add: $ 2.00 for foreign postage

---

**VHS** tape of July 15, 2000 presentation by Stefanie Brochocki on the design history of the BKB-1 (Brochocki,Kasper,Bodek) as related by her father Stefan. The second part of this program was conducted by Henry Jex on the design and flights of the radio controlled Quetzalcoatlus northropi (pterodactyl) used in the Smithsonian IMAX film. This was an Aerovironment project led by Dr. Paul MacCready.

Cost: $8.00 postage paid
Add: $2.00 for foreign postage

---

**An** Overview of Composite Design Properties, by Alex Kozloff, as presented at the TWITT Meeting 3/19/94. Includes pamphlet of charts and graphs on composite characteristics, and audio cassette tape of Alex's presentation explaining the material.

Cost: $5.00 postage paid
Add: $1.50 for foreign postage

---

**VHS** of Paul MacCready's presentation on March 21,1998, covering his experiences with flying wings and how flying wings occur in nature. Tape includes Aerovironment's "Doing More With Much Less", and the presentations by Rudy Opitz, Dez George-Falvy and Jim Marske at the 1997 Flying Wing Symposiums at Harris Hill, plus some other miscellaneous "stuff".

Cost: $8.00 postage paid in US
Add: $2.00 for foreign postage

---

**VHS** of Robert Hoey's presentation on November 20, 1999, covering his group's experimentation with radio controlled bird models being used to explore the control and performance parameters of birds. Tape comes with a complete set of the overhead slides used in the presentation.

Cost : $10.00 postage paid in US
$15.00 foreign orders

---

### NURFLUGEL

"Flying Wing"
by Dr. Reimar Horten & Peter Selinger

350 illustrations
German & English text
Limited number of the "flying wing bible" available
Cost: $49.00 plus $4 shipping and handling

SCOTT flycow@aol.com
12582 Luthern Church Road
Lovettsville, VA 20189 Sole U.S. Distributor

## FLYING WING SALES

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

U.S. Pacific (650) 583-3665
892 Jenevein Avenue mitchellwing@earthlink.net
San Bruno, CA 94066 http://home.earthlink.net/~mitchellwing/

## COMPANION AVIATION PUBLICATIONS

### SAILPLANE HOMEBUILDERS ASSOCIATION

**The** purpose of SHA is to foster progress in sailplane design and construction which will produce the highest return in performance and safety for a given investment by the builder. They encourage innovation and builder coop-eration as a means of achieving their goal. Membership Dues: (payable in U.S. currency)

| | | | |
|---|---|---|---|
| United States | $21 /yr | Canada | $26 /yr |
| So/Cntrl Amer. | $36 /yr | Europe | $41 /yr |
| Pacific Rim | $46 /yr | U.S. Students | $15 /yr |

(includes 6 issues of SAILPLANE BUILDER)

Make checks payable to: Sailplane Homebuilders Association, & mail to Secretary-Treasurer, 21100 Angel Street, Tehachapi, CA 93561.