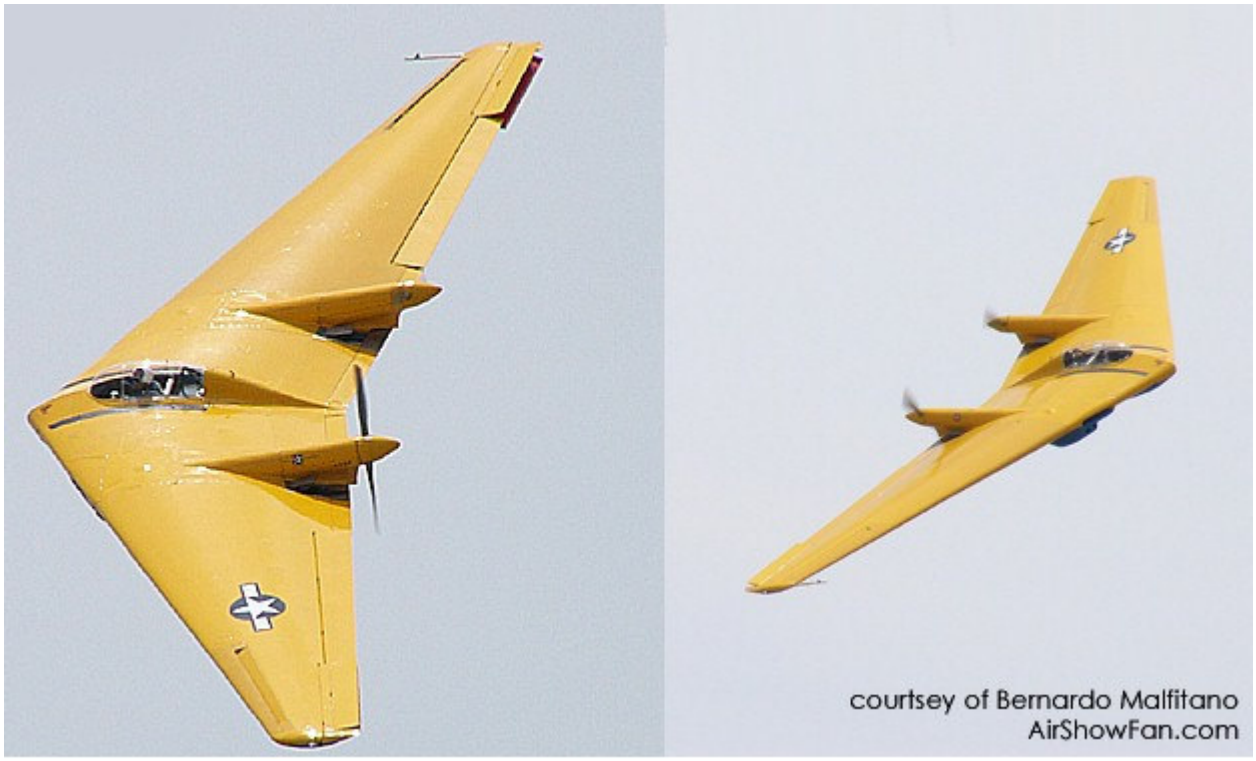
No. 249 MARCH 2007

T.W.I.T.T. NEWSLETTER

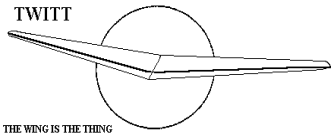


T.W.I.T.T.
The Wing Is The Thing
P.O. Box 20430
El Cajon, CA 92021

The number after your name indicates the ending year and month of your current subscription, i.e., **0703** means this is your last issue unless renewed.

NOTE DIFFERENT MEETING PLACE FOR THIS MONTH'S MEETING.

Next TWITT meeting: Saturday, March 17, 2007, beginning at 2:00 pm at Allen Airways Hanger, 2020 N. Marshall Avenue, El Cajon, CA 92021. (West side of Gillespie Field close to the base of the control tower.)



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: Bob Fronius (619) 447-0460
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**
Password – **member02**

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

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

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

Foreign mailings: $0.75 each plus postage

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

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

As you have probably seen already, since I know many of you look at the body of the newsletter before you read my words, we have lost Bob Fronius. This is the second loss in as many months and we at the TWITT hanger are very saddened by the events.

I hope that as many of you as possible will be able to attend the memorial on March 17th at the Allen Airways Museum. This will be a special gathering of Bob's relatives and friends to remember his life and wish him a fond farewell.

Bob had been a fixture for my entire life as he and my parents were friends before I was born. I missed many of the years while away in the military, but got the chance to refresh the friendship when I returned and became involved in TWITT. I would like to thank Doug Fronius for giving me the opportunity it do an interview with the Union Tribune staff writer who was putting together Bob's obituary. I got so wrapped up in talking about what Bob had done years ago, I completely forgot to mention his founding of TWITT and what it meant to him over the years.

TWITT was Bob's passion for many years. He had been thinking about flying wings well before the formation of the organization and had done some preliminary work on his own designs.

Although I have been the President for many years, Bob was really the guiding light behind many of the things we did during those years. The directions we took as membership dwindled, the change in program schedules, etc., were all approved by Bob although in many respects he didn't like having to make those types of decisions. He thought everyone should be a flying wing enthusiast, since this type of aircraft was obviously the most efficient from every aspect.

We will all miss Bob tremendously.

Andy

MARCH 17, 2007 MEMORIAL

On February 9th we lost Bob Fronius to poor health. Bob was one of the original founders of TWITT back in 1986, but the seeds of the dream started back in the early 80's. He was the driving force behind the organization all those years and he always had the last say in what we were doing. He was the glue that kept us going during those early years and help build TWITT into a worldwide group of flying wing enthusiasts and looked to as a leader in all things related to flying wings and other types of tailless aircraft. His network of friends was a core to having monthly programs for a number of years and he was always an active participant in the meetings. Bob was a unique individual who was thinking "outside the box" well before it became a catch phrase. He is going to be greatly missed by all of us. Bob was also an active member of the Vintage Soaring Association (VSA) and the Experimental Soaring Association (former SHA). He was a fixture at the annual events held by both of these groups flying one of his vintage or experimental sailplanes.

On the next page we have included the obituary that was printed in the San Diego Union Tribune newspaper. It will give you a much better look at the many adventures in Bob's life and why some people considered him a "real character".

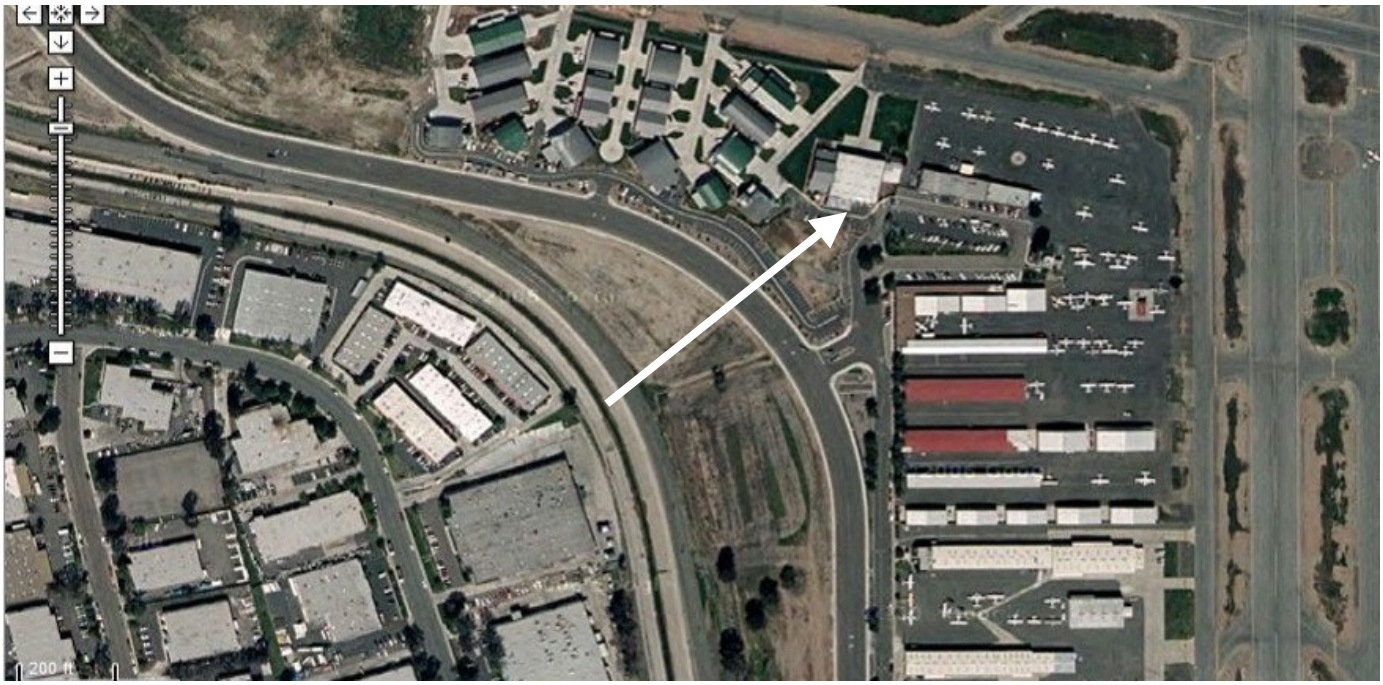
The Remembrance will be on Saturday 17 March at 2:00 PM at the Allen Airways Museum, 2020 Marshall Ave, El Cajon, CA. This adjacent to the parking lot at the base of the FAA Control Tower on the west side of the airport. See directions and airport photo below.

Right on Cuyamaca for 1.4 miles Directions to Allen Airways Flying Museum:

From the North - Take 5 or 15 South to 52. Go East on 52 to Santee. Exit Mission Gorge. Left on Mission Gorge for 1.7 miles. Right on Cuyamaca for 1.4 miles to Marshall/ Weld. Left on Marshall. Turn into second driveway on your left (one half of a mile).

From the West - Take 8 East to El Cajon. Take the Main Street Exit. Turn right on Main and then an immediate left on Marshall. North on Marshall for 2 miles. Continue through Bradley and turn into airport parking lot on your right (one half of a mile).

From the South - Take 94 toward El Cajon. Go North on 125 to Santee. Exit Mission Gorge. Right on Mission Gorge for about 1 mile.
to Marshall/ Weld. Left on Marshall. Turn into second driveway on your left (one half of a mile).



OBITUARY

Bob Fronius

Sky Was No Limit For Local Aviation Enthusiast

By Michael Kinsman
STAFF WRITER
February 25, 2007

Bob Fronius spent a lot of his life up in the air looking for a soft landing.

He made hundreds of jumps from airplanes, often using experimental parachutes. He was an avid hang glider who made his last flight at age 68. And he continued to pilot sailplanes at 80.

He even developed parachutes for hang gliders and airplanes years before they became commonplace.

For six decades, he participated in various facets of sport aviation in San Diego, intrigued by his own ideas about flight as well as those of others and willing to explore them all.

"I would call him an adventurist, someone who really was thinking outside the box long before that became a catch-phrase," longtime friend Andy Kecskes said. "He was always thinking about how to do things in a unique fashion."

Bob Fronius, shown as a young man in the Navy, owned the San Diego Parachute Co. He also piloted sailplanes and hang gliders.

Mr. Fronius, an El Cajon resident, died Feb. 9 of chronic breathing problems at a skilled nursing facility in Rancho Bernardo. He was 91.

He took his first airplane ride at age 10 in his hometown of Minneapolis and was smitten by it. He started hanging around the Wold-Chamberlain airport there and at 17 made his first solo flight.

From that point, his life would revolve around aviation, first in the Navy, then later as a parachute maker, aircraft mechanic and sport aviation enthusiast.

"It didn't matter what he was doing, he was always thinking about how he could make something better," Kecskes said. "He was either thinking about redesigning or re-engineering something, or finding a better way to do things. He was always tinkering."

Mr. Fronius came to San Diego after joining the Navy in 1936. He made his first parachute jump a short while later at Dutch Flats, the military airfield that was located on a site now occupied by the Midway Post Office.

He worked as a parachute rigger and fabric repairman aboard the aircraft carriers Lexington and Saratoga during World War II before returning to civilian life in 1942.

But he was so interested in parachutes that he bought the San Diego Parachute Co. and began designing chutes. He tested many of his experimental chutes and made hundreds of jumps.

After the war, he moved his company from Lindbergh Field to Gillespie Field in El Cajon when the Marine Corps vacated its parachute jumping school there. His business was the first commercial enterprise at the airfield.

Mr. Fronius did jumps at air shows, and in 1943, he purchased a sailplane and added glider aerobatics to his air show parachute routines.

"He took a lot of risks, but he wasn't a daredevil," Jerry Ryan said. "He was very careful in what he did." Ryan and his father, aviation pioneer T. Claude Ryan, employed Mr. Fronius as an aircraft mechanic at three companies, including the one that would eventually become Teledyne Ryan Aeronautical. He helped Ryan develop power-gliders.

"He was an outstanding and versatile mechanic," Ryan said. "He could do anything you wanted done – he would just figure out a way to do it. He was just the kind of guy you wanted if you were developing experimental aircraft."

Mr. Fronius was a founding member of the San Diego chapter of the Experimental Aircraft Association and took up hang gliding in his late 50s. He founded the organization now known as the San Diego Hang Gliding and Paragliding Association, the oldest hang gliding club in the nation.

ABOVE: Bob and son Doug Fronius.

He resumed sailplane flying at 68 and continued that until he was 80. "He loved adventure," Kecskes said, recalling that Mr. Fronius was toying with the idea of affixing a dining room chair to helium balloons to float eastward over the Cuyamaca Mountains to the Imperial Valley. "Why would he do that?" Kecskes asked. "Because nobody had done it before so why not?"

ABOVE: Floyd Fronius during his talk at TWITT on hangglider cross country flying with Bob looking on.

Mr. Fronius is survived by his daughter, Susan Olsen of Seattle; sons, Doug of Poway and Floyd of San Diego; a brother, Joseph Fronius of Minnetonka, Minn.; sister, Betty Eastgate of Minnetonka; and three grandchildren.

A private interment is planned at Fort Rosecrans National Cemetery. A remembrance is planned for 2 p.m. March 17 at Allen Airways Flying Museum at Gillespie Field, 2020 W. Marshall Ave., El Cajon.

ABOVE: Bob and June during a relaxing moment.

LETTERS TO THE EDITOR

(ed. – The following letters came in as a result of my e-mail announcement of Bob Fronius' death on February 9th. The family appreciates all the condolences sent by the soaring and aviation community.)

February 11, 2007

More Sad News

Thank you very much for your really sad information about Bob. If there is any consolation may be this:
I lost many good friends in aviation and I always think about them when there was a beautiful flight: Maybe as angels they assisted and fell with me the happiness that flight has given!

Thomas Bircher

Please offer my deepest sympathy to Doug and Floyd. I only had a few days with Bob and June. In that short time I developed an affection for them. Not necessarily for the wealth of fascinating stories they told (truthfully I don't remember very many details of those) but because they were just a pleasant and interesting old couple.

June insisted on introducing me to all the other denizens of skid row and seemed more interested in talking about the men in her life than of herself. So I learned more about Bob and Wally (and the history of real estate on Point Loma) than about her.

Bob, of course, mostly wanted to show his sail planes and mementos because he assumed that I made the trip to see his museum. He was only partially right about that.

The first time I was out there was to see the TWITT hangar and Stefanie Brochocki, whom I had known via e-mail and telephone for a couple of years. My second trip was intended for getting better acquainted with Bob and other members but that meeting turned out to be on the day that the vintage sailplane regatta got rained out so there were about 30 extra people in the hangar, all intently listening to Paul MacCready try to talk over the rain that was beating against the steel roof. The next day was clear so we drove out to Torrey Pines and spent the day watching the regatta. All in all a nice visit. I'm sorry I won't have another chance to see them.

Love your friends while you have them

Norm Masters

February 17, 2007

Dear Friends of Bob Fronius:

Please know that you have my condolences regarding the death of our fellow enthusiast and good friend. His presence at our conventions in Tehachapi were always appreciated and contributed much to our organization's success.

We will miss him.

Sincerely yours,

Don Santee

Andy please pass my condolences to Doug and Floyd. Bob was one of the first persons I met in the soaring world. That was in late 1945. He was always an interesting character and a great pleasure to have known him.

Al Backstrom

I am sorry to hear of Bob Fronius' passing.

In every one of our communications Bob was always positive and helpful. It was always a pleasure to work with him. He will be missed by many.

Richard Avalon

February 25, 2007

What drew me to Bob was his description of his Minnesota Balloon jumps of the mid 1930's Did I miss something??? *(ed. – I don't think so, but there was only so much that they could include in the obit.)*

Bob Recks

February 18, 2007

June Wiberg and Obituary in Hangar Soaring

The editor of "Hangar Soaring", the official quarterly newsletter of the American Woman Soaring Pilots Association WSPA (WWW.womansoaring.org), Frauke Elber, asked me for a contribution honoring June Wiberg. As I don't know enough about her, I ask you for kind help, please, either writing an obituary yourself or providing me with the information necessary, that I could do it

myself. As English is not my first language, I would have troubles with the right wording, probably, but I would try it.

Kind regards,

Peter F. Selinger
<peter.f.selinger@jocki.org>

(ed. – I have provided Frauke with the material I published in last month's newsletter along with a couple of pictures. I will also try to find more information about her in the next month to add to article that should come out in May.

I think this is just great to recognize June's many years in the aviation community even though she was not a pilot. She did a great deal for many people over the years and deserves the recognition.

Thank you Peter for initiating this article.)

February 11, 2007

Bert Verhees' Delta Wing

I exchanged e-mails with Mr. Verhees and he intends to sell plans when they are ready.

http://verheesengineering.com/gb/bouw.html#projecten

Bruce McCaskey
<bruce_mccaskey@yahoo.com>

(ed. – Thanks for the updated information. Hopefully, people will take advantage of the plans and we will see more flying wings in the air in the years to come.)

February 15, 2007

Back Issues

I would like to order some/all back issues of your newsletter. Do you have an index or some kind of list of the newsletters and their contents? Can they be ordered as PDFs instead of paper documents? Thanks for your help, and look forward to hearing your response.

Eric Stewart
<je_stewart@hotmail.com>

(ed. – I offered the following information that I though might be of interest to everyone who might want to obtain back issues beyond what's on the web site.

"To answer your question on electronic copies, we have 5-years of PDF formatted newsletters in the members only section of the web site. It would cost you more than a membership subscription to obtain that number of hardcopy issues, so it would seem easier for to just become a member to gain access to these issues.

To go back all the way to July 1986 can be done but will take a little time since we are out of some issues and would need to get them reproduced to meet the order. I do have Word formatted issues going back to about mid-1997 that are burned on a CD that could be copied, but I don't have a price for that at the present time since it is a new development.

So you can see there a several options. The CD based issues need to be reviewed for formatting and don't include the cover pages or some of the photos since that was a period when I was doing some electronic and some manual formatting for the printers.

After thinking all of this over, please get back to me with which way you would like to proceed and I will see how long and what the cost factor would be for your choice.

Sorry for the convoluted response but we haven't had a request for back issues in such a long time we hadn't been really planning ahead for it.")

Thanks for your quick reply. OK, I guess I will join TWITT and use the membership privileges to look through the last five years of the PDF'd newsletters. If I think I still need more after that, then I will let you know. You can now add Japan to your list of international members.

Thanks again,

Eric

February 18, 2007

PBS program

Great 30-minute show tonight on "Raptor Force" using the birds & gliders to reveal flight techniques for future aircraft.

Video would be great for a future meeting. If you do find it, I'll be there to see it again & ask Doug (Fronius) some questions.

On my first aviation job of towing & teaching gliders I never perceived all the things those stealth researchers divulged. (What they didn't divulge would probably knock our socks off.)

Bob Recks
<r.recks@juno.com>

(ed. – I had written back to Bob indicating I would watch the TV guide to see when it came on again and they try to tape it. So if anyone out there happened to tape it, please let me know so we can arrange for a copy that could be used at a meeting. Otherwise, I will see what can be done through PBS.)

February 21, 2007

Nickel Book

Here is a little information on the photographs I sent you last month. The one on the cover was an electric ducted fan model of my own design. It used a GWS EDF40 fan unit with a brushless motor. It is an all-wood design with all control linkages internal to cut drag.

The delta wing model with the Cox 049 was not designed by me, but built from plans from www.ulmer-rc.com . It is called the "Blink", probably because if you blink you miss it! Really fast model, and fun to fly.

The last photograph is of a VTOL tail sitter model of my own design. It uses the GWS IPS-F motor and gearbox, again with a brushless motor, and a 14" prop. Vertical take-offs are no problem, but vertical landings were more of a challenge.

The drawing is of my new 6 flap model under construction. I have included a progress picture with this email. It will have a wooden airframe with carbon capped ribs for better rigidity. I am using the RS004A airfoil with -4.5 degrees of twist across the wing.

Chris Doughty
<chris.doughty1@gmail.com>

(ed. – Thanks for the information on each of the models. I have included the photo in the next column.)

March 1, 2007

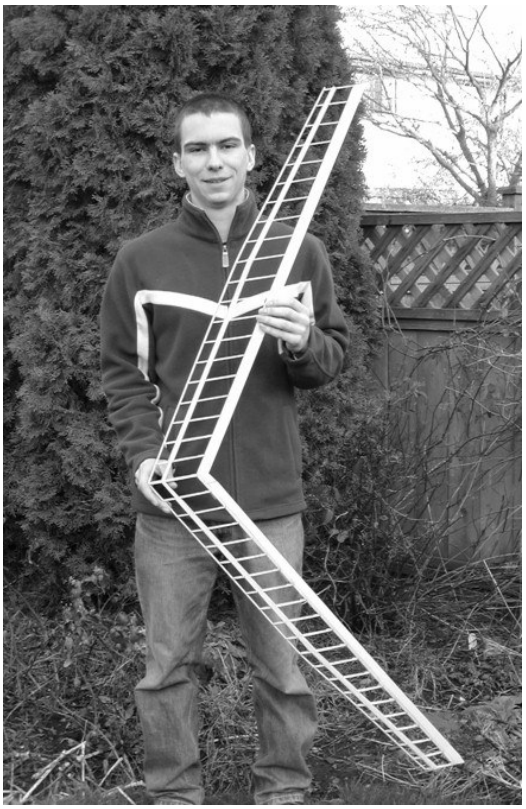
Structure Volume Calculation

Hello- I've got a question for this forum. Several means of investigating the volume displaced by the complex structures we consider here at TWITT have been used by me in order to determine displacement. I've sliced and diced the structures to their constituent geometric components in order to get a volume determination; immersing solids in liquid in order to determine displacement has been considered. What methodology or thoughts on the subject do you have?

Regards,

Henry E. Whittle
<gulfrose@juno.com>

(ed. – If anyone has an answer for Henry, please make sure you include TWITT as an addressee on your e-mail so we can pass it along to everyone.)



March 5, 2007

Vintage Gliders Australia

Hello:

I have developed a web site for Vintage Gliders Australia (www.vintageglidersaustralia.org.au) I would be grateful if you could place a link to it on your site, I have placed a link to your site on this.

Regards,

Anne Elliott
<annell@hwy.com.au>

(ed. – Although not a flying wing site, it looks like it has some interesting material so I will add a link on our site. I will also pass the link along to both the VSA and

ESA webmasters so they can also add it to their web sites.)

Nurflugel Bulletin Board Threads:

February 21, 2007

Plank Airbrakes

Question is, how to slow down enough for a Safe Slope landing with say a 3-meter Plank.

Normal Scale Air brakes as used on other 1/4 or 1/3 scale models, are they effective on a Plank? If they are, are there any weird tricks as far as placement like on, near, behind or in front of CG , or does it matter?

I have been out searching a bit but nothing so far.

Dan Field
<danfield@roadrunner.com>

I built one of Al's EPB-1a as a kid. I had a 4' model with timer actuated controls (couldn't afford RC back in '60) and tried some control aspects before going to full size. He used spoiler plates on tip rudders, but having dispensed with those, I tried lower wing plate spoilers (ala Schweizer) attached to the spar, and they seemed to work without pitch change. Finally went to split rudder, actuated in the full size by depressing both pedals. Used spring detent centering device, and small magnets in TE to keep it closed.

Bob Storck
<bstorck@sprynet.com>

Spoilers and airbrakes don't "slow thing down" as they increase drag, but do nothing to increase max lift. They will bring L/D down to make pattern work easier though.

That said, planks should not be adversely affected by spoiler location. But fer cryin' out loud don't put them in front of other control surfaces! You'd be surprised by those who make this basic mistake (X-47A). A swept wing is a different story, as putting spoilers just aft (that is outboard for aft sweep and inboard for forward sweep) of the MAC will give a reasonable control response.

Note: the above placement in the case of sweep will give a slight nose-down moment when the spoilers are closed.

Al Bowers
<al.bowers@dfrc.nasa.gov>

I am going to differ a tiny bit here and write as a glider flight instructor instead of an engineer.

Whether spoilers/airbrakes (for practical purposes, the terms are interchangeable) act to increase decent rate or reduce airspeed depends on the intent of the pilot. In fact they can do either or both.

If the pilot increases pitch as the spoiler are deployed, the glide path will remain the same while the airspeed bleeds off due to the drag of the spoilers - acting in this case as airbrakes. On the other hand, if the pitch is held constant, the rate of decent will increase.

Spoilers/airbrakes are just devices to add drag which the pilot can use as desired.

As for chordwise placement, I'd suggest on the center of lift.

Most sailplanes will exhibit some trim changes as spoilers are deployed. The vertical placement also matters. High wing gliders exhibit pitch-up on spoiler deployment while low wing glider will pitch down. These pitch changes are unpleasant and come at landing when precise flying is required.

Finally, sufficient drag is needed to allow a fairly steep dive at reasonable airspeeds. Current European certification standards require enough drag to allow a 45 degree dive below maneuvering speed.

Some older gliders had enough drag to allow a vertical dive with the airspeed stabilized below redline - called "terminal velocity limiting dive brakes". This capability is useful for escaping powerful updrafts in clouds but can be tricky in normal landings.

Bill Daniels
<BILDAN@COMCAST.NET>

Thanks for all the input. After posting I did find a few samples on the Net. I saw the split Rudder as well as Top & Bottom like the Phoenix, Spoiler Doors (not sure I like those) and even an idea from a Salto conventional where at a short Flap Location but Hinges in the middle so when deployed it's up and down, has some possibilities.

Not being an Engineer either, I like Bill's approach as a logical way to go about it. Size was going to be the next question but I would assume an equal size used on current conventional Scale models should do the trick. Wing Thickness may be a problem, we will see. May have to resort to the Spoiler Doors and try to get em as vertical as possible.

Every thing I could find on Crow style Flaps that pilots had tried was not working well at all for a Plank. I had a HLG Swept Wing that it did work very well, but that's another story.

Now to find a Fast design that Turns hard with good energy coming out, aka pylon racing. I have been

looking at F3B models but there seems to be less experimenting with Wings in F3B which tells me this may be not such a good idea or more would be used. The F3B guys of course need to have excellent Thermal qualities as well where for good slope lift it's important but as much.

Dan Field

The most effective airbrakes I ever used on a modern full-size glider were the rotating trailing edge flap type fitted to gliders like the Glasflugel Mosquito. For those that have not seen them, they consisted of a normal trailing edge flap used for thermalling and another, forward-facing flap of about equal size, and on the same hinges, that could be locked to the trailing flap so that it rotated with it. As the trailing portion went down so the forward portion came up. I could dive this aircraft vertically with full brake and the airspeed would not go beyond 85 knots. You were literally hanging on the airbrake hinges! There was a small pitch change due to their operation but nothing dramatic and they were progressive in effect. And there was sufficient elevator authority to round out properly too.

The only other aircraft that I flew that you could do that to was the Slingsby Skylark 4. That had DFS-type paddle brakes above and below the wing.

In both cases, this was because the makers had designed it that way.

Would this work with a plank?

I just wonder if anyone has tried the forward and backward trailing edge flap on a plank? If the brakes are confined to the middle part of the wing and the outer controls are elevons I would have thought you could arrange the opening angles above and below the trailing edge to produce a neutral result in pitch that would maintain trim over a reasonable range of approach speeds.

Hang on a minute there! Since planks need plenty of reflex in their sections how about raising the trailing edge a little first then deploying the forward part of the flap below the wing?

Chris Bryant
<chris@palenquin.demon.co.uk>

Chris has a good point. My Nimbus 2C has such dive brakes. With the brakes closed, the L/D is just less than 50:1 but with them open it's less than 1:1. That's a lot of action for 15 cm of brake handle movement.

However, I'm not sure this dive brake design would work well on a flying wing. Likely it would disrupt pitch stability and control.

Planks DO NOT require 'plenty of reflex'. Take a close look at the Marske P1A in the photo section. The upper surface from the thickest point to the trailing edge is essentially flat.

Bill Daniels

>Every thing I could find on Crow style Flaps that pilots had tried was not working well at all for a Plank.

It's not that it won't work, but that it must be well-designed. Today's models are so light, with so much excess power, that there is a tendency to slap almost anything conceivable on the plane and it still flies. A plank is less forgiving of such carelessness.

The trailing edge is simultaneously a camber-changing device and elevator. So if you raise the trailing edge to decrease lift and increase drag, you pitch up as well. A perfectly coupled aileron/flap crow setup should be able to handle both and still maintain directional control. It would take a lot of work to get it right.

Bill: An airfoil with a flat upper surface has a lot of inverse camber -- otherwise called reflex. The Marske P1A clearly has reflex and forward sweep.

Rick Page
rick-page@shaw.ca

Yes, the P1A does had reflex but far less than, for example, than the Fauvel designs. From flight testing of the P1A, I would judge that it still had far too much reflex.

Excessive static stability can be a huge problem for flying wings since it overpowers the available damping and leads to pitch oscillations. Static pitch stability just needs to be slightly positive. That doesn't require much reflex at all.

Bill Daniels

February 12, 2007

I managed to find a wealth of material that I think would be resourceful to a lot of people in this group.

1) "The development, design and construction of gliders and sailplanes" by Lippisch

http://ntrs.nasa.gov/search.jsp?R=892995&id=10&qs=Ntt%3Dglider%26Ntk%3Dall%26Ntx%3Dmode%2520matchall%26N%3D0%26Ns%3DHarvestDate%257c1

2) "Glider construction and design"

http://ntrs.nasa.gov/search.jsp?R=498523&id=8&qs=No%3D30%26Ntt%3Dglider%26Ntk%3Dall%26Ntx%3Dmode%2520matchall%26N%3D0%26Ns%3DHarvestDate%257c1

3) "Development of tailless and all-wing gliders and airplanes"

http://ntrs.nasa.gov/search.jsp?R=341109&id=7&qs=No%3D40%26Ntt%3Dglider%26Ntk%3Dall%26Ntx%3Dmode%2520matchall%26N%3D0%26Ns%3DHarvestDate%257c1

4) "Recent (1930 !!) tests of tailless airplanes" again by Lippisch

http://ntrs.nasa.gov/search.jsp?R=117445&id=10&qs=No%3D60%26Ntt%3Dglider%26Ntk%3Dall%26Ntx%3Dmode%2520matchall%26N%3D0%26Ns%3DHarvestDate%257c1

5) "The design of sailplanes for optimum thermal soaring performance"

http://ntrs.nasa.gov/search.jsp?R=275227&id=1&qs=No%3D50%26Ntt%3Dglider%26Ntk%3Dall%26Ntx%3Dmode%2520matchall%26N%3D0%26Ns%3DHarvestDate%257c1

6) Some docs on hang gliders:

http://ntrs.nasa.gov/search.jsp?No=80&Ntt=glider&Ntk=all&Ntx=mode%20matchall&N=0

For more check out http://ntrs.nasa.gov/search.jsp

Brunno
<brunno04017@yahoo.com>

(ed. – I know it would be difficult to type in all these links, but if you are interested, drop me an e-mail and I will cut and paste them so all you need to do is click.)

February 16, 2007

In Alain Pelletiers book "Les Ailes Volantes", I've found a photo of the Payen Pa.60 . Just some weeks ago, I came across another photo on Bruno Parmentiers site Aviafrance, but this is showing the Pa.61B.

The Pa.60 suffered from insufficient engine cooling and was modified, and this modification lead to the new designation. Photos of the Pa.60 clearly show a lateral cooling intake, but none can be seen on the Pa.61B. But ...all photos I found, show the left side of the Pa.60, but the right side of the 61B, so maybe there was just ONE intake at all on the left side ? can anybody give more informations?

AJ Baganz
<A_J.Baganz@t-online.de>

February 18, 2007

Am preparing a super easy throw-model for a school demonstration. I took the task on me to teach the oldest students of the most theoretical classes some technical stuff. It will be a bit of the stuff around the basics of flight. I want to let them make an easy to make throw-model-glider. I have a foam-hotwire at home I can use. Cut about1 1/2 feet long.

Can anybody help me with templates of such a easy to make glider. It has to be made in less than a hour. Some really quick stuff as I will have a class of about 30 persons. No stuff with sweep and so as it will make it possible that the wings will not have the same incidence when badly glued. I was thinking about a flying plank. Or ... it there something else that is easy to make?

Koen Van de Kerckhove
<nestofdragons@hotmail.com>

I don't know what you have available, but Jim Marske has done a "flying plank" demo at workshops that is a lot of fun. He takes the top of a styro-foam dozen egg carton, trimming it to the part that's flat, keeping the bump in the center (a handy place to grab when done). He takes a weight and tapes it to one edge, which becomes the front (I've found an eight penny finishing nail is about right). The carton cuts with scissors pretty well, without much danger. Flies fine!

Now, for youngsters, I've done workshops on all kinds of things from kites to Guillow hand launch gliders (you used to be able to buy them by the case pretty cheaply!) I'd do a Marske egg carton flying wing project, giving the kids two cartons to start with. I'd walk them through one as described, and then turn them loose and ask them to improve on it. They'd move the weight around, keep a bit of the turned LE and TE to change camber, and trim the ends to make fins. Plus had a lot of fun with colored magic markers.

Bottom line, no one really improved ... ALTHOUGH!!! One kid taped on three nails and by throwing it hard, it flew fast and straight ... a LONG way. I kinda explained it was more like a dart, and

avoided having to explain wing loading, penetration, etc. Whew!

Bob Storck
<bstorck@sprynet.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

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

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.