No. 248 FEBRUARY 2007

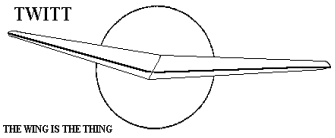
T.W.I.T.T. NEWSLETTER

One of Chris Doughty's many models that are flying wing configurations. For more pictures see page 6 inside.

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., **0702** means this is your last issue unless renewed.

Next TWITT meeting: Saturday, March 17, 2007, beginning at 1:30 pm at hanger A-4, Gillespie Field, El Cajon, CA (first hanger row on Joe Crosson Drive - Southeast side of Gillespie).



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

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

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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).

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PRESIDENT'S CORNER

As you will see from the January meeting recap we have lost another member of the TWITT family. This time it was someone very close to all of us here in San Diego when June Wiberg was admitted to the hospital on January 11th after displaying some symptoms of weakness and later passed way from heart failure. The suddenness of this was a shock since she seemed to be in good health when I visited with Bob and her just the previous Saturday.

It is an understatement to say that she will be missed. June was a mainstay for TWITT since the very beginning by performing a variety of functions that those of us who worked a regular job could not always get to. Without her we wouldn't have had some of the great programs in those early years since she spent hours on the phone calling people an making the arrangements. Did you enjoy all those great anniversary cakes? Although she didn't make them, she knew the right bakeries to get them from and always ordered just the right amount.

June was a fixture at the hanger along with Bob. During the 1980s and most of the 1990s, they were at the hanger six days a week taking care of business with June providing assistance to many of the hanger residents up and down "skid row". She was the common point between everyone and acted sort of like a clearinghouse by passing messages around and helping with organizing various functions within the hanger community.

June was also a very active participant in the Sailplane Homebuilders Association (now the Experimental Soaring Association). Her spirit of volunteerism was so special that the ESA has an award named after her, "The June Wiberg Spirit of Volunteerism Award". She was also a volunteer with the Vintage Sailplane Association, so you can see she meant a great deal to a great number of people.

Andy

JANUARY 20, 2007
MEETING RECAP

There was no official program for January, however, we had a large gathering as we turned the meeting into a memorial service for June Wiberg. June passed away on January 11th while in the hospital due to some health issues. It was all very sudden for most of us and especially for Bob Fronius since she had been his constant companion for nearly thirty years.

June had been an integral part of TWITT since its inception in 1986. Her vast network of contacts throughout the aviation community helped put many of our programs together over the years. She was the operations center by answering the hanger phone and providing callers with all the information they needed about meetings and joining TWITT. She made sure there were always coffee, donuts and soft drinks available for the members when at the meetings. Bob, Gavin and June would have a monthly Wednesday night session putting the labels and stamps on each of the newsletters for mailing the next day.

June, 80, was born in Pennsylvania, but eventually found her way to Grand Prairie, Texas where she met and married Wally Wiberg. They ran a glider port for a number of years and Wally competed in various national contests. They moved to San Diego where Wally worked for several of the aircraft companies located here at the time. He owned the Lil Dogie sailplane that Paul MacCready successfully flew in the Nationals and was latter purchased by Bob who used it for local sport flying in southern California.

There were about 40 people from TWITT, Gillespie and other friends and family attending the memorial. Many spoke about her giving heart and how she helped so many of them over the years. One attendee, Dusty, a golden retriever would have touched her heart since she loved dogs and always had a bag of treats for them.

As everyone commented during the memorial recollections and in general conversation, June will be sorely missed by all of us.

I have included a some pictures of June and those that attended the memorial. It was actually hard to find pictures of just June in the albums that were readily available in the time we had to put everything together. She was such a part of everyone's life's as can be seen by the number of people who came to say a final good-bye.

Above: June at a celebration. She loved her sweets.
Below: With Bob at what appeared to be a vintage sailplane rally.

Even Dusty seemed to realize the nature of our meeting.

Above: Bob being offered condolences by Bruce Carmichael and Ed Labahn while being observed by Bob's granddaughter.

Above: Flyod Fronius, Pat Oliver and, Bruce and Margie Carmichael sharing stories of June just before Doug Fronius **(below)** led the memorial with some of June's history and asking for others to relate some of their favorite stories about June.

Above: June getting ready to close the Lil Dogie canopy for a flight by husband Wally at what looks like could be Elsinore, CA during a national contest. Wally had come up with putting a wet towel over his head to help protect him from the heat and sun while flying over the desert areas.

LETTERS TO THE EDITOR

(ed. – These first few letters were received from some of our members who couldn't make it to the memorial service, but wished to offer their condolences to Bob and TWITT. It shows what an effect she had on peoples lives and TWITT.)

Nancy and I will not be able to make the memorial due to a prior commitment on the 20th which unfortunately we can't break. Please send our condolences. Both my wife Nancy and I have many fond memories of June. She was truly one of the motivating spirits of TWITT and a great lady. We will miss her and will most assuredly remember her in our prayers.

Bill and Nancy Otto

This is very sad news. For the first time since I moved here in '98 I wish I could just hop a 'plane and be with the rest of you when you say goodbye to her.

There was certainly never any doubt of her support for TWITT. At least at the time I knew her, she got very annoyed whenever anyone suggested that there might be more important matters to attend to!

Happy landings!
Regards to all,

Marc de Piolenc
Iligan City, Philippines

I will not be able to attend the memorial for June on the 20th. but please pass along my condolences to Bob and Doug. I do not have a direct address for either of them.

Al Backstrom

My respectful condolences to all of June's friends and relatives. I always enjoyed her company at the Homebuilders conventions at Tehachapi. She was a mainstay of our soaring organization.

Don Santee

Very sorry to here about June. Please pass my condolences on to Bob and Doug. So sorry, but to far away to attend any service.

Thomas Bircher

The news about June is most tragic, and so unexpected. Please pass on my deepest sympathies to Bob. This must be terribly distressing for him. My condolences to all at TWITT. I can't imagine going to a meeting without her being there. She did so much to welcome me and George on each of our visits. A very special person, indeed.

Stefanie Brochocki

I am sorry to hear that June Wiberg has passed on. A good friend and associate will be missed and thank you (June) for all of your good works with all of your friends and the fine work that you have done for the TWITT association.

I'm sure she will be in a better place.

Richard Avalon

January 12, 2007

Belgian Flying Wing

This will blow your mind if you haven't seen it yet.

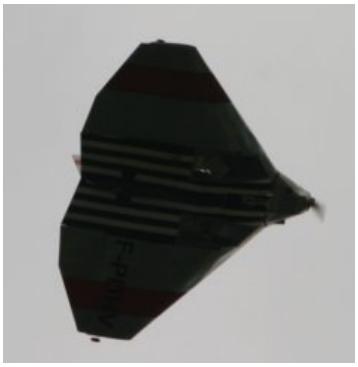
Go to :

http://www.jsb-engines.be/index_E.html

and click on "1.6l DD1c"

Bruce McCaskey
<bruce_mccaskey@yahoo.com>
Lochbuie, CO 80603

(ed. – Although the website is about engines, the application in this case was for a flying wing designed by Bart Verhees. Here are a couple of pictures from the website.)



January 14, 2007

Thank you for your patience with my slow renewal progress and your reminders with the highlighted newsletter renewal code field.

Here's a small item which is probably not worth any hand wringing, but I am in the office and don't have any of my TWITT newsletters with me.

I was wanting the mailing address for renewals and couldn't remember the member ID and password to access a copy from the website. However I took a chance with the SAMPLE copy anybody can see, and it has the ID and password we're STILL using !!!

So fortunately for that SNAFU, here's a twenty for the cause.

Larry Witherspoon
<larry.d.witherspoon@boeing.com>

(ed. – Thanks for the renewal. I usually give everyone a month or two to get it in before removing them from the mailing list. Sometimes it takes not getting one to remind people that haven't renewed.

Having the user ID and password somewhere on the website is one of those things related to not having anyone else proof the pages before they are published. I was trying to bring things more up to date for any new people discovering the site and didn't realize what I had done. It hasn't been fixed yet, but I may just decide to change the use ID and password as an easier approach.

As a reminder, you don't need to go to the members' only section to find our mailing address. Just click on the About TWITT link on the home page and scroll to towards the bottom and you will find all the contact information. Now that June is no longer at the apartment I will need to remove the daytime phone number since Bob doesn't hear the phone ring and has trouble hearing a regular receiver.)

January 15, 2007

Bob, et al

Member close to 20 years now and can't wait for the newsletter every month. You and Andy have been doing one heck of a job keeping our group together.

Thanks a million.

Fred Blanton
Fred.Blanton@prodigy.net
Vacaville, CA

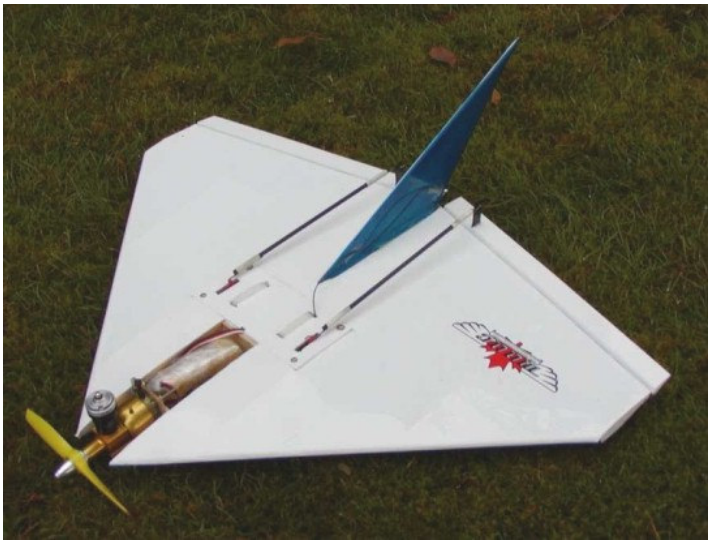
(ed. – Thanks for the comments and your renewal. Bob's health of late has sort of removed him from the day-to-day functioning of TWITT, but he still has input when it comes to the big decisions. For the most part Gavin Slater and myself are handling the routine activities, which fortunately haven't been extremely time consuming lately.)

January 18, 2007

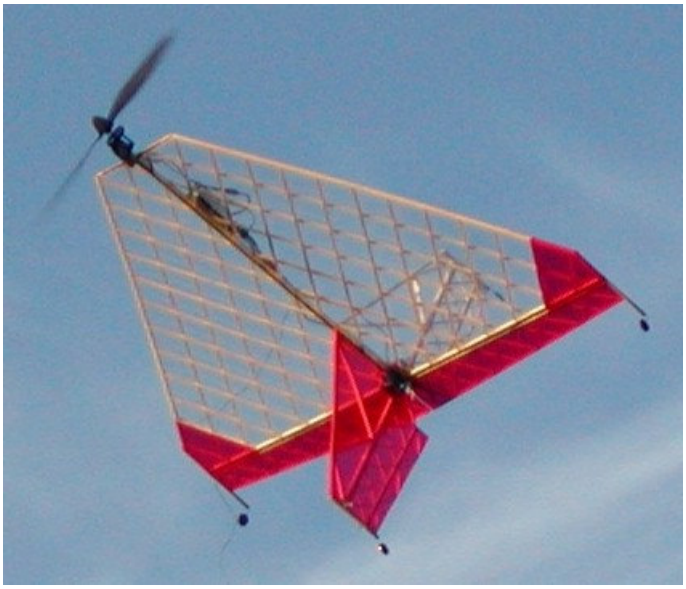
I am very sorry I have not replied to thank you for your research into locating this book. Seeing the letter published in the last newsletter jogged my memory. I will keep an eye out for a used copy from

the sources you listed. Some of them are certainly out of my price range!

I have been RC modeling for quite a few years now, and have become a flying wing enthusiast without even being conscious of it! One day I started looking at the models I have made over the last couple years and counted no less than 8 flying wings! These models range from electric park flyers, to combat models, to VTOL planes. Many of these models I designed, and a flying wing layout was chosen simply because it seemed like the best choice for each intended purpose.



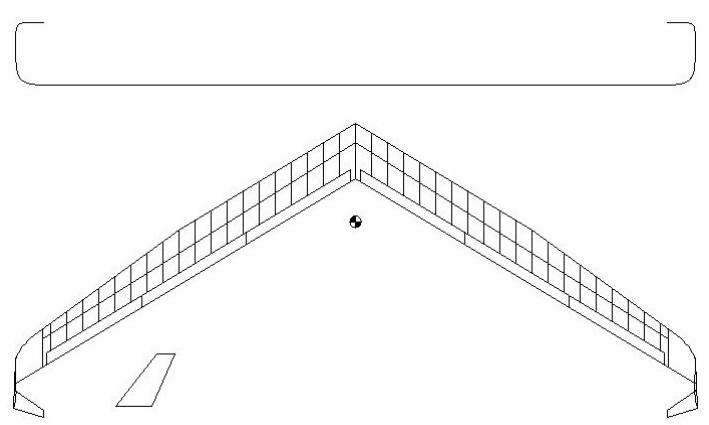
I have now finally invested in a computer radio, and a more advanced electric flying wing sailplane on the building board. It will use a 6 flap control system, which should be a fun challenge. It will be interesting to see how this model turns out.



Cheers

Chris Doughty
<chris.doughty1@gmail.com>

(ed. – I sent a quick e-mail to Chris asking for pictures which I have included below. What I didn't ask for was a little more information on each of them and then I forgot to request it again when he sent the pictures. So Chris when you have a couple of minutes send me a little information I can publish next month. Thanks.)



January 15, 2007

Your photos, coverage, articles, etc., about Jet Man is wonderful. Bell labs tried but gave up. This has been the best news in many years. I hope that many others will continue in this form of flying. This is better than hang gliding or power gliding.

The article clearly says 4 engines but only two show.

I want to know more.

Eugene Turner

(ed. – Glad you enjoyed the article. These are the types of things that come in from the member or I find from information on the Nurflugel bulletin board.

I can't answer the question on the number of engines, since I just cut and pasted the article from the web site, but it is clear there are only two engines under the inboard wing sections. Anyone know more?)

January 30, 2007

I have attached a photomontage of my Ellipse II airframe. I include no text regarding the design this

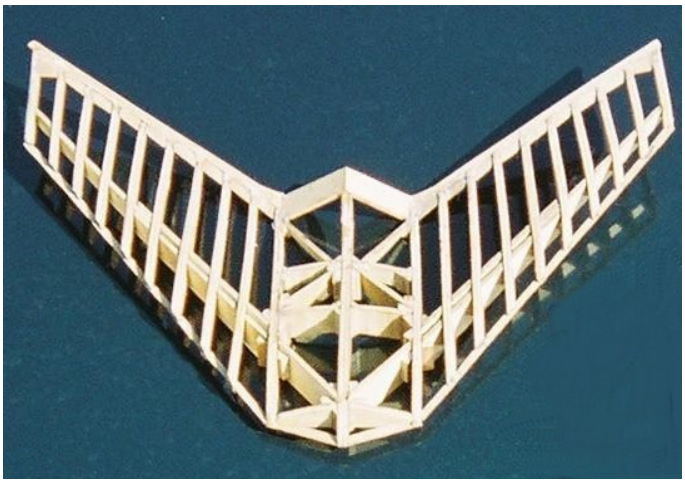
time. I believe I about said it all in the January '06 number of the TWITT Newsletter.

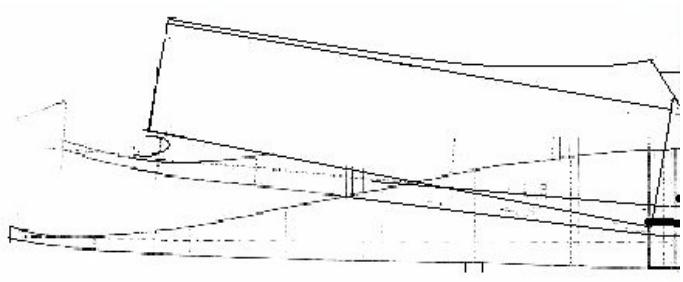
I will be taking some flight shots of the version of this airframe, constructed of manila folder for the airframe and covered by typing paper, as soon as the weather warms up. Right now it is so cold nationwide that the Bears are in Florida.

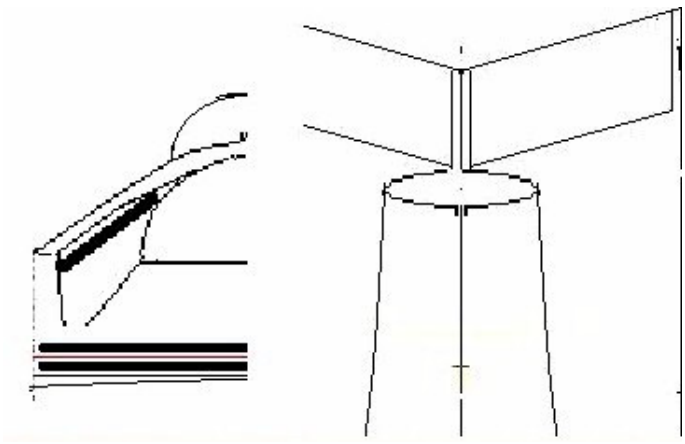
Regards,

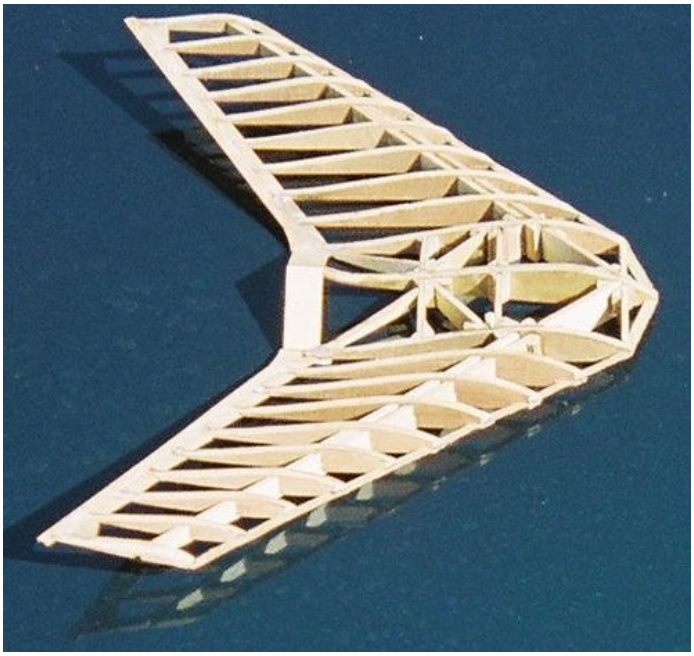
Hank Whittle

(ed. – I have taken Hank's montage apart to make it easier to include in the newsletter. We look forward to seeing more of this in the future. Good luck with the flight testing.)









Mitchell U-2 Bulletin Board Threads

Alternative Motors/ Power Plants

Posted by: mitchelvictorywing@yahoo.com

Just thought I'd give an update for those interested in alternative power plants. Plettenberg has a 15kw motor in the works. Please keep in mind that Pletenberg underrates their motors. One of these motors should be able to fly the U2. And it is my understanding that Schulze is developing a more powerful sped controller to match.

Another alternative I've found (although heavier) is the Etek. The older Etek is a brushed motor but the new one is brushless. They look to be able to handle up to 20kw and sustain 10kw but I'm not certain at this time. I just bought a brushless Etek and I'm going to try matching it up with the speed controller from a Honda insight. At present, the only cheap alternative for a speed controller has been the Sevcon millipak pmac which is only 48v and 200a. But the Insight speed controller can handle 144v. A little overkill considering my target is 96v. This power plant is going into a 3wheeler, a bit easier to monitor and safer if something goes wrong.

Lastly, I've noticed the price of Lithium Polymer batteries going down. Also their ability to discharge and recharge at a higher rate is getting much better. So there may be an electric U2 in the future after all.

Posted by: andydcoles@verizon.net

Interesting about the Plettenberg motor.

If Joe Flynn's Parallel Path Technology becomes commercialized, this would be really useful for the U2. Would just need a small lead-acid battery to start (just like gas engines now), rather than a wing load of batteries which discharge fast.

That's if it's ever allowed to see the light of day. I can't see the oil companies being too delighted about trying to sell gas against a 347% efficient electric motor. It could drive a parallel path generator too, and thus keep itself and a prop running!

Posted by: billj@hevanet.com

I think you misunderstood 347% efficient to mean it made more power than it consumed, which is not the case. That would make it a perpetual motion machine, which is impossible. It was stated that a target output efficiency of 87.5% (of input power) is reasonable at high speeds and (I hope I understood this correctly) a much flatter torque curve throughout the RPM range. This would make for a very powerful electric motor but you would still need power to put INTO the system to make it go. A well designed commercial electric motor installation is usually 90% efficient.

The Wiki article that describes this idea contains an unfortunate mishandling of engineering and thermodynamic terms that can lead to a great deal of misunderstanding. I do not know if this was intentional or just poor writing on the author's part but either way, it puts Joe Flynn's idea in a poor light.

Posted by: RaymondLanda@hotmail.com

You are right and although it may not surprise you, the Plettenberg motor is about 89% efficient. And the 15kw motor should only weigh about 6 to 7 lbs!

With the Schulze speed controller weighing less then 1 lbs. Also the Plettenberg is direct drive so there is no added weight from a re-drive. Just bolt on a 36"-40" prop. I'm guessing its 15kw sustained but capable of 20kw for a short duration.

But don't rule out the possibility of the perpetual motion machine just yet!

Well almost, the bearings will eventually give out.

Posted by: Ken Voth

My B-10 plans arrived today. I've been busy looking at them. They are a little simpler than the U-2 plans. There's only one bow to make in the spar and the airfoil is plain 23015 without any reflex. What Now?

Do I need a Serial number do I just start building? I have some aircraft spruce on hand that I can start ripping for rib material.

I'll need some 1 mm. ply soon for gussets and some epoxy to start building ribs. I'll have to check if I have a piece of spruce big enough to rip for spar flanges. I may have to glue some strips together for spar caps. We have a local salvage place that sometimes has some aluminum. Otherwise there is a place in Kansas City that carries quite a bit of aluminum. Shipping is so high from the west coast or Aircraft Spruce. I have a 25 h.p. Kohler engine but I think it's too heavy. Is a 15 h.p. Hirth enough power. I'm so concerned that I go over the ultralight weight limit. Enough for now.

Posted by: mitchellwing@earthlink.net

Glad to hear that you have started construction of your B-10. I would suggest that you go with a 250cc size motor with around 23 to 28 hp. You will be much happier with the performance.

Don't worry too much about being overweight, the wing should weight about 85 pounds, so you have quite a bit to play with. Just don't add a lot of extra things and weight everything carefully and often.

You also might check with Wicks Aircraft Supply, they are located in Illinois and their prices seem to be reasonable, however, I have not dealt with them yet to say for sure.

Good luck and have a happy holiday season, and if you can't find what you want, give me a holler.

Posted by: dennismingear@yahoo.com

Aircraft Spruce still carries a spruce kit for the B-10. Here's a link, you'll need to call them to see what the "kit" includes, Richard may know too. Link:

http://www.aircraftspruce.com/catalog/wppages/sprucekits.php

Mitchell Wing/U2 Center of Gravity

I am still confused to a point as to what exactly is the CG LIMITS of the U2. Richard says the, I guess, window is 3" fwd of spar to 1" aft of spar. Am I correct? This post was #2613 dated Nov 25 Hitbull, which I understand his statements about Wt & Bal much better than the Wt of the nose wheel with pilot aboard and ready to fly should weigh x. He says in post #2609 dated 23 Nov. The CG is 1" aft & ideal is .5" aft of

spar. My question is. All aircraft have a CG LIMIT window. What is it for the U2 Mitchell Wing? I need a measurement from somewhere/ reference datum or from the spar to what the WINDOW is.

I know you cannot have a CG, empty or full of fuel, remain the same through flight, unless you are a genius. I do also know you had better not exceed the window, for your on safety. This is my concern. I have used some arms and some calculated weights for my craft, and for the #'s I have, I will need to have a nose wheel wt og 100# to have a CG of 53", which is in the middle of the window that Richard gives. These wts are calculated as max. wt. Thanks to anyone that can help.

First ,let me make a statement. I do not make any profit helping others tuning their wing. I just wish that if people finished their project they would fly safely. Hundreds of hours are spent building this bird. I also do not recommend people NOT to build if they believe in the hype of 20/1 glide/ratio, which I think would not exceed 15/1 in a perfect plane like Wolfgang (if he would remove his 3 bladed big prop). Maximum glide I got from mine with a foldable prop was 13/1 and 350 feet of sink rate. However people that are almost at completion deserve the help. And the machine well tuned flies very good without any bad behavior.

My calculations come from experimenting the machine for more than 700 hrs by now. Last time I flew was 3 weeks ago...I found playing with the CG that the cg envelope I said will result in an enjoyable flying machine and that the Cg at .5 inch in the back of the spar is a good compromise between performance and stall behavior. It has a good climb rate for the old Koenig and also have a tendency to pitch down at stall speed, which is good for a touring flyer like me. If you put the cg right in the middle of the spar, it will be flyable but with a strong tendency to pitch down. So you will need some "up" elevons (trailing edge up in ref to the ground) which will cause more drag and your take-off will be longer, bigger stall speed and lower climb rate not to mention the big trims you will add to get the stick neutral in forces. I certainly would not try cg forward of spar...You will need excessive speed to take-off and it will take you by surprise...It happened to a guy in this site few years ago. Start if you want the cg right in the middle of the spar, measure the elevons opening right at the first rib (inboard) in comparison of the main wing rib # 7 and tune from there...Read Tasso Proppe article in my file. It is very useful for understanding wing behavior and elevons. My reference point to fine tune is ,when I fly at 50 mph level, my elevons are running about 5 degrees trailing edge up...So if you add something (light) ,it is easy to fine tune again without the 3 scales stuff. For sure if you high speed and take off and to maintain level, the elevons are more than 10 degrees up or less than 0 degrees (they should deflect at least minus 5 to plus 25). Put it down immediately and shift things around...unless you are a test pilot (not my case). This summer ,I tried to put on an open cockpit and I would need 10 mph extra to take off and the elevons were 15 degrees up. I did not even bother to make a whole circuit. I put it down after a hop just to realize that somehow my cabin is providing lift and the open cockpit canopy was destroying that lift...too bad for those 90 degrees hot days. For sure, the cg will change somehow in flight cause of the gas. If you put a gas tank sitting right at the spar, the cg shift will be very small. I have 2 wings tanks of 3 gallons each and they are attached at the back of the spar and it is fine. Chewing some gas just makes the plane more stall resistant. Adding some weight far away from the spar is not dramatic as long as you redo your cg calculations. As an example, I last summer I put on a foldable prop and the hub assembly was 4 pounds heavier and the cg shift was slightly more than 1/8 of an inch...I did weight and balance on the machine to prove my calculations. Maybe some people here want to push the bird out of the flight envelope. I do not recommend it at all. But it would be nice to have reports on the subject if they are still around.

I am sorry I haven't responded to your response/ help about the CG before now; have been watching epoxy cure Haa. I do thank you for the info on CG and do value your help. You are the only one that will admit the flying experience on the wing. Yes, I will proceed with caution. I have bounced a bunch of # around in the CG area, and am working with estimate wts. at the present, but trust me, will make sure all is good before going airborne. I would like to know what the empty wt. of your plane and what HP engine you have. And if you have any info as to where one could find a canopy, other than Todd's pass it on. I am nearing the point where I need some dimensions so I can build up around that area.

Nurflugel Bulletin Board Threads

Posted by: <al.bowers@dfrc.nasa.gov>

Some folks were talking about "drag"erons and spiral instability. Sweptback flying wings don't have spiral instability (anyone who's flown a Zagi or thermalled a flexwing hang glider could tell you this). Its only planks or relatively unswept wings that have the "falling into the turn" spiral instability issues (though it might be possible to build a very low sweep flying

wing that had spiral instability, anhedral will also make this worse).
And why create drag when birds don't. Maybe they know something we don't?

Posted by: urossi@bigpond.com

A question, if I may. Do swept forward flying wings have spiral instability?

Posted by: al.bowers@dfrc.nasa.gov

I can't think of a situation where swept forward wings do not have spiral instability, but that doesn't mean they don't. There may be a special case I am overlooking. But in general, they do.

This should not be taken as an indictment against swept forward wings. Many aircraft have unstable spiral modes (e.g. the Cessna 150/152). The mode is slow enough that a pilot easily (and many times unknowingly) stabilizes the motion. This is also true of unstable phuoid modes (very common in aircraft).

Posted by: bildan@comcast.net

Writing solely about sailplanes which have large wingspans and fly very slowly - I think they all have spiral instability.

In a slow speed turn, the outer wingtip is flying faster than the inner wingtip by a significant amount - ~15 knots in the case of my Nimbus. This means the inner tip will have less lift and more drag (due to the higher AOA) and so result in the glider trying to tighten up the turn. Glider pilots know this as "overbanking" but it is spiral instability. Shorter spans and higher airspeeds reduce the effect.

Glider pilots are taught to apply a small amount of "top aileron" against the direction of turn to just hold off the overbanking tendency. The resulting adverse yaw shifts the lift and drag toward the inside wing just enough to cancel the natural overbanking resulting in a stable turn that requires little or no rudder input.

Pilots will sometimes report that a particular glider has spiral stability when in fact it just has friction in the aileron control circuit that prevents the ailerons from blowing back to neutral when the stick is released.

That said, all of Jim Marske's designs (even the P1A which had no ailerons) exhibited excellent stability about all axies. It was possible, even in turbulence, to release the controls and open a map to read.

Posted by: al.bowers@dfrc.nasa.gov

I agree Bill. I think nearly all our modern sailplanes have spiral instability. But it was remarked by all the pilots that none of the Horten sailplanes had spirally unstable modes. Though I think it may be possible to design/build a swept wing sailplane that was spirally unstable.

Posted by: bildan@comcast.net

The subject of flying wings leads naturally into the discussion of stability and control issues. however, there are other, more practical areas which receive less attention than they should.

Sailplanes are defined by extremely high aspect ratios, which implies a narrow root chord (or a very large span). Humans, on the other hand, come in a fairly narrow range of sizes, which, in any event, is outside the control of the sailplane designer.

The human pilot will represent a significant fraction of the all up weight. The requisite thin, high aspect ratio wing means the pilot cannot be housed inside the wing but must have a fuselage or "pod" for the cockpit.

A sailplane designer must provide a comfortable cockpit with at least acceptable visibility. In modern designs this is nearly supine. Having done this, he must then somehow get the center of lift and the CG into the proper relationship.

The Hortens placed the pilot in a prone position (Actually kneeling like a motorcycle racer.)for CG and visibility reasons. This is probably acceptable for a young and agile pilot - less so for paunchy old timers. Even so, the visibility wasn't all that great.

Jim Marske chose forward sweep not so much to move the wingtips forward as to move the root aft to make room for the pilot in a conventional cockpit. Even so, it would be desirable to move the pilot still further forward to get eyes ahead of the wing leading edge for better downward visibility. Of course, this shifts the CG and requires still more forward sweep to get the CL in the right place.

I have suggested that a strongly forward swept inboard wing balanced by a swept back outer wing would open up the constraints. This "cranked" planform would be very bird-like. It would also allow a very conventional cockpit with the visibility pilots have come to expect.

It would allow a shoulder wing for less drag in the wing root/fuselage juncture. (A low/mid wing allows the pilot to lean back over the wing spar carry through structure but limits downward visibility and may introduce flow separation problems in the root area.)

Finally, it would place the elevator hinge line far enough aft for good pitch stability and control without the need for a large root chord and thereby obtain a high aspect ratio without an excessively great span.

I don't have a good handle on the stability and control issues this planform would introduce but Nature seems to like it.

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