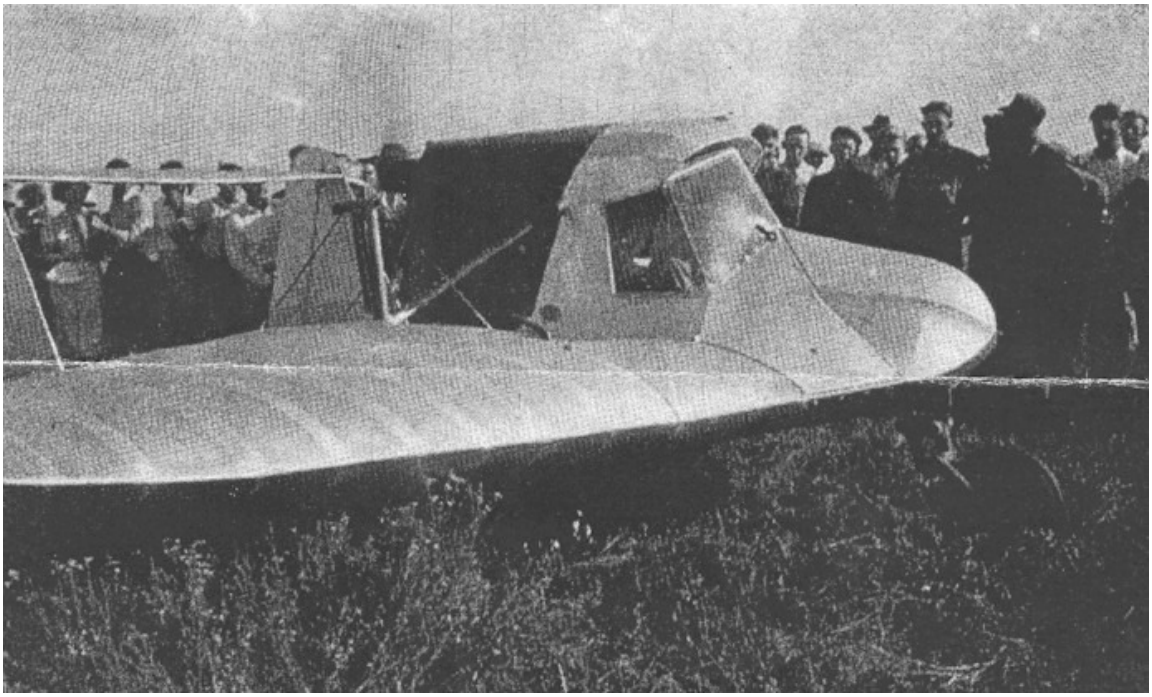
No. 288 JUNE 2010

T.W.I.T.T. NEWSLETTER

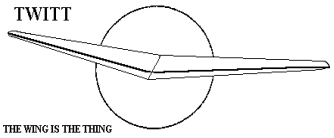


This airplane was designed and built by Dale Walter. He called it Jeep after a part of the Popeye comics of that ear. It was roadable with folding wings. It also was a flying wing type of aircraft with a cutout for a person to stand while swinging the propeller. It was powered by a 90 horsepower Cirrus engine. (Provided by Larry Nicolson)

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., **1006** means this is your last issue unless renewed.

Next TWITT meeting: Saturday, July 17, 2010, 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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The **T.W.I.T.T.** office is located at:
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Wt/#Issues	FRG	AUSTRALIA	AFRICA
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48oz/48	40.00	42.00	30.00
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Meetings are held on the third Saturday of every other month (beginning with January), at 1:30 PM, at Hanger A-4, Gillespie Field, El Cajon, California (first row of hangers on the south end of Joe Crosson Drive (#1720), east side of Gillespie or Skid Row for those flying in).

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PRESIDENT'S CORNER

I hope everyone enjoys this issue, although there is a sad note with the announcement of Rudy Opitz's passing in early May (see page 5).

The big thing to absorb from this issue is that I have changed the user ID and password to the members only section of the web site. I do this periodically as we lose some members so they no longer will have access to the newsletters. I have updated this masthead in the left column with the new codes so you will always have them handy. They are case sensitive so make sure to enter them as shown:

USER ID: 20issue10
PASSWORD: twittmbr

The next meet isn't scheduled until July, but I don't have any program (as usual) so you don't need to make plans for that Saturday unless you would just like to come by the hanger, visit with us and check out what is going on along Skid Row. I am making progress on the 1-26 so there might actually be something to see by the time beside a bare framed fuselage.

With the weather getting better I hope some of you are getting back to work on your projects or you are out flying you new models. If so, please take a few minutes to drop us a line and photo of what you are doing so we can share it with the other members.

Andy

LETTERS TO THE EDITOR

May 3, 2010

(ed. – Here is my response to the letter from Mike Smock and a follow-up from Geoff Steele.)

I apologize for taking so long to get back to you, but I had to give it some thought. I will take your questions in order.

1. I would think the H III would be a good subject for a model. Some of the subsequent sailplanes have more complex structures and I think airfoils that make them work. I know the IV with its long slender wings, although nice, would create some structural issues, in my opinion.

2. I have never seen any plans for the Horten designs, but I think there are some out there somewhere. My suggestion for a place to start would be the Deustches Museum Flugwerft Oberschleissheim in the Munich area (I believe) where they have been doing Horten restorations. The Deutsche Technikmuseum in Berlin has also been doing some restorations, depending on which is closer to where you will be.

3. While I would love to take on such a project I already have a Schweizer 1-26 full size restoration underway so can't do it. I have placed your message in our newsletter that will go in the mail later this week since we have a number of modelers who might be in a position to do the build and documentation. I have asked them to contact you directly.

4. I can't think of any content we have that would fit into the types of presentations you have. We do have one member who has been doing various types of bird models and has contacts with others around the world who are also experimenting with these designs. He will see the message in the newsletter and if interested will contact you direct.

In case you hadn't notice this area of our web site, you might want to look at what we have to get an idea of what the museums have been doing.
http://www.twitt.org/subindex.htm#horten

Andy

May 4, 2010

Glad the circle closed here. Thanks for responding to Mike. He has a very nice website and the quality of his kits appears to be superb (though quite pricey...). I'm sure he will benefit from the connection with TWITT.

BTW, I haven't joined TWITT yet, so it might be a good idea to do that. Can you send info? Does the newsletter come electronically, or via paper and snail?

Hope you are well. Al Bowers and I are in pretty constant contact and I see that he's occasionally sneaking down there to hang out with you guys.

Geoff
<gstee1_4him@hotmail.com>

(ed. – I thought I would take this opportunity to remind everyone that I can provide you with a CD-RW disk with all the back issues. This means you wouldn't need to download them from the web site if you want your own copies. The cost is $5 for mailing in the US and $6 for overseas. You can then simply add new ones as they are published. The disk has enough room for another 25 years of newsletters before it is full.)

May 7, 2010

Hi Andy:

You are right. The information on the back of the book (LA BANCARELLA AERONAUTICA) is where the interested readers can purchase the book. As far as I know they ship all over the world.

They also should be contacted by anyone interested in printing an English version of the book. While I am not interested in publishing an English version in Italy, I am prepared to supply an English version to anyone who volunteers to undertake this task.

While mentioning *"TUTTALA HORTEN"* to the readers of TWITT, could you kindly mention my article *"PRACTICAL HORTEN"* published on the April 2010 issue of the magazine on-line *"RC Soaring Digest"*, published by the Kuhlman's. The issue can be downloaded freely from rcsoaringdigest.com.

Keep going with your excellent work.

Ciao

Ferdi Gale'
via Marconi 10 Citofono 13-B
28831 Baveno VB
0323-922089
<ferdigale@alice.it>

(ed. – Ferdi's book, "TUTUALA HORTEN" [Horten Tailless], is currently only published in Italian but you can find a link to the publisher on the TWITT web site or click on the link in the letter.

If there is anyone out there that orders it and then finds they would be interested in working on getting an English version published, contact Ferdi directly.)

May 14, 2010

Some of your members may be interested to know that Chuck Tucker, the man who flew the YB-49 through all the AAF's stall tests and even recovered it from a spin, died a few weeks ago.

Chuck's amazing career is partly documented in an interview he gave me for my book 'GM,DS! The Billion Dollar Blunder in choosing America's first dedicated nuclear weapon delivery system'.

He had been a Flying Tiger with four kills in China, an AAF test pilot and Op Officer of the US's first jet fighter squadron (Lancaster, CA 1945) where be became a personal long-time friend of Neil Armstrong and then a Northrop test pilot, and on the side he bought and flew in all the 1946-1949 Cleveland National Air Races in his own two Bell P-63 King Cobras, modified with advice from Kelly Johnson.

He survived a low level 500-mph disintegration of a Northrop XP-89, and a 35,000-ft. spin while unconscious in a F-104, being chased down and advised on recovery by Deke Slayton. He was modest, humble, straight-talking, and loved airplanes.

Chuck's beautiful wife Marcella died a few years before, and his is survived by his two sons, in California.

His stories about flying the great Northrop Wings related in my interview were awesome. He loved the airplane.

Terrence O'Neill
Carlyle, IL

(ed. – There is link to ordering Terry's book on our web site in the Add To Your Library section.)

May 17, 2010

In the Mar/Feb Newsletter, Hadley McIntyre, had some questions about reflexed airfoils and the one I am using on my LARA Mk 5 design. I am sending this letter to you snail mail because my cranky old computer will only transmit e-mail in the Reply mode. I have not found a computer expert who can convince it to do otherwise. So any one who wants info about my project can e-mail me (lpdesignlab@ecentral.com) or call 303-280-3271.

I've enclosed a page of 3 reflexed airfoils plus the stations of the GA- 30OU-212- 75 that I am using on the Mk5. I chose Harry Riblett's GA-30OU -212 airfoil to reflex because: 1. His method of development of the airfoil's nose curves was more elegant than merely plunking a round tube on the airfoil's leading edge; 2. The GA-30 already had a shallow camber so reflexing it a bit would not be a radical change and; 3. The center section of the LARA wing also acts as the fuselage. The aft 40% of the GA-30 is somewhat thicker than the other two airfoils so maybe I could make a stronger but lighter aft structure that could handle the loads generated by the "T" tail with out a bunch of extra bracing.

Jim Marske's little book "Experiment in Flying Wing Sailplanes" is an excellent primer about selecting and optimizing reflexed airfoils. He describes 2 reflexed airfoils that had performance "Plateaus". They performed well at a narrow range of airspeeds but performance deteriorated greatly at either side of that speed plateau.

Jim used the NACA 23112-75 on his Pioneer series with excellent results. Since I will be strapped into 14-foot chord wing, I want a much less abrupt stall than the 23000 series produces.

Jim's book also has good info about using models to test aerodynamics. He built models with spans from 11" to 8 feet.

Speaking of scale models leads me to strongly recommend Stan Hall's "Dynamic Modeling" articles in the 1987 July and August issues of "Sport Aviation".

They have been my basic guide while designing and making my own RC models. I believe that a major part of the informational success I have had from my models resulted from the info contained in Stan's articles.

The reflexed airfoil that I have cobbled up SEEMS to satisfy my performance criteria. I include the word 'seems' because after experiencing several model's performances I believe models smaller than 50% of the final configuration are more "indicators" than "provers". There is a valid reason that manufacturers such as Northrop, Messerschmitt, Chance-Vought et al went to the trouble and expense of constructing man carrying test planes to prove their theories enough for them to spend time and money to manufacture their designs. I assume that I will not know if my airfoil selection is right until I strap my butt into my full size machine and charge up into the blue. I hope this stuff answers some questions.

Jim Loyd

(ed. – I have forwarded this to Hadley for his consideration. You will find the coordinates table on page 11. My thinks to Jim for taking the time to send this in.)

May 19, 2010

I am enjoying my browse through the newsletters and found an interesting project near the end of November 1987 issue. The 3-view on graph paper page 7 illustrated by what appears to be Gerald Butler, Box 635, Santee, CA 92071.

I checked the roster of Jan. 2003 and didn't see him there. Can you please see if this address matches the supposed name and if he is still a member? I wanted to talk to that designer about center section lift of the Horten style wing, and engine, prop assembly. Please see if this member can be contacted.

Thanks again,

Stephen Sawyer
Lincoln, Calif.
<s-sawyer@sbcglobal.net>

(ed. – I checked back into some of our historical information and couldn't find where Butler was ever a member of TWITT. I also couldn't find anything in the local directories that would provide a lead to contacting him. If anyone out there knows of Gerald Butler and how to get a hold of him, please let Stephen know.)

May 21, 2010

Aloha: Pardon my belated response. I previously flew an Icarus V hang glider (built by Larry Mauro) but crashed it back in 1976 when I clipped a tree coming into a tight landing spot; I got out of the hospital three months later. I also flew and still have an Easy Riser that we may convert to electric power; we flew it with various two strokes, both direct drive and reduced. I have a 1952 Cessna 170B that I use for inter-island flights and movie work ("The Rundown" and "You, Me & Dupree") and a small open cockpit flying boat similar to an Osprey 1.

I have followed electric flight since 1973 when Larry Mauro (Ultralight Flying Machines) started working with electric power that resulted in the Solar Riser that is now in the EAA museum. More later, I'm taking my grandkids surfing today.

David Bettencourt
airlaw@pixi.com

(ed. David is a new member and was relying to my usual request on how new members learned about TWITT and a little bit about their aviation interests.)

May 19, 2010

(ed. – This came in from Larry Nicholson as a response he sent to Harold Walter, along with the cover picture. I have tried to track down where you can get the Airplane Beans book that was published in 2005 and is 182 pages with some illustrations. You can try both Amazon or Google Books to see if they have any for sale, probably at around $40. ISBN: 0976938804, 9780976938804)

Hi Harold (Walter):

Thanks for the *Kansas Wing OX5 News*. It is very interesting, as is your book. You have had a storybook aeronautical engineer's life, and have much incredible knowledge.

Would you send a copy of Airplane Beans to the

editor of the *TWITT Newsletter*, Andy Kecskes, PO Box 20430, El Cajon CA 92021? (The Wing Is The Thing). Enclosed is another check for it. Andy also edits the *Sailplane Builder*.

I am not online, but TWITT and *Sailplane Builder* are. I am sending you a copy of their newsletters.

The sparkplug of TWITT was an old friend, Bob Fronius, who has now passed away. He had LK gliders a generation before the one I restored and flew that burned up in the San Diego Aerospace Museum years ago. Bob worked at Convair and Rohr, the Ryans, T. Claude and Jerry, among others, and was the ultimate airplane enthusiast. So are his sons, Doug and Floyd.

Dale Walter's Jeep looks like a fun little airplane; have you ever thought of updating it?

Members of both TWITT and the Experimental Soaring Association would be very interested in your book. Also detailed articles on your horizontal tail design for the Convair Charger, the airplane's end, and about your 'Walterons', the fixes on the Starship, etc.

Modelers would interested in your 'too easy to fly' U/C model elevator design. It could be a real boon to a new generation of U/C modelers.

If circumstances were right, hopefully you could give a presentation at one or more of the two organization's meetings.

Keep 'ern flying,

Larry Nicholson

RUDY OPITZ
1910 - 2010

Posted by: "Bill & Bunny Kuhlman" bsquared@themacisp.net b2_tailless

From Rob de Bie, Netherlands, via the Me-163 Yahoo group: I just read that Rudy Opitz passed away on the first of the month, age 99.

Posted by: "Bowers, Albion H. (DFRC-PA)" Albion.H.Bowers@nasa.gov

Apologies to all, I should have passed the news on about Rudy. I heard about a week ago. He was 99, and the last couple of years had Alzheimer's pretty bad.

Rudy was a great gentleman, and he had lived an amazing life. From a youth flying gliders, to being one of the seven pilots that flew the assault on the Belgian

Fort Eben Emael, to being the test pilot for the Me-163 Komet, to coming within one race of being the US National Champion flying the Horten IV. Farewell Rud Opitz...

(ed. – Rudy and Al at the 2001 Flying Wing Symposium held at Harris Hill. Pictures by Geoff Steele as published on Nurflugel.com)

Posted by: "Peter F. Selinger" Peter.F.Selinger@jocki.org

Dear Al,

In regard of Rudy Opitz' passing away I want to correct you a little bit. As far as I know it, Rudy didn't suffer by Alzheimer but by very severe arthritis (that caused strong pains when moving his fingers), and also severe troubles with his ears and eyes. Even at the beginning of this year he followed with great attention all happening around him in aviation, especially when people tell wrong stories about himself and his life. And always he tried to correct those stories even and especially when they would have given him additional
(not true) merits, humble and honest as he ever was.

Posted by: "Marc" piolenc@archivale.com fmdepiolenc

Sad to hear, though I had assumed that "Pitz" had died long ago. He was one of the glider "greats" whom I missed meeting by a few hours. He attended a

sailplane conference in San Diego years ago - he and Hanna Reitsch, both friends of Bob Fronius and June Wiberg. They were going to introduce me, but I was too busy cataloguing the Ho XVc materials and forgot to go down to the convention center. Dope...

What a fascinating life he had. Are there any biographies?

Obituary

Paul Rudolf (Rudy) Opitz, age 99 of Stratford, entered into rest on Saturday, May 1, 2010 at St. Vincent Hospital, Bridgeport. He was the beloved husband of Hanna Boljahn Opitz for 61 years. He was born on August 9, 1910 in the town of Landeshut, in Silesia Germany.

He started his love for flying by joining a local flying club and teaching himself how to fly in a homebuilt glider. After receiving formal instruction in 1932, he entered and placed in several gliding competitions. Between 1941 and 1945, he acted as chief military test pilot for the Me-163A and Me-163B rocket powered interceptor aircraft. He made the first powered flight of the Me-163B, the only rocket powered interceptor aircraft ever to achieve operational status. The Me-163 Komet was a tailless rocket powered interceptor and was the fastest aircraft to see combat in World World II, achieving a top speed of well over 600 MPH in level flight.

Rudy Opitz enters a Komet Me 163B at Bad Zwischenahn while being assisted by senior Messerschmitt mechanic Schöffler. His flight suit, boots, underwear and gloves are made of a non-organic, nylon-like material. Clothing made of organic material like cotton would burst into flames on contact with T-Stoff. The pilot was protected by 13mm armor behind his head and shoulders, and 8mm armor behind his back. A 90mm armor glass screen gave frontal protection with a 15mm armor nose cone. The constant speed propeller in front drove a generator for electric power. Source:
http://homepage.ntlworld.com/andrew.walker6/komet/flight/flight1.htm

At the end of World War II, he was recruited by the U.S. Government, ultimately coming to the U.S. to work at Wright Paterson Air Force base as a part of operation Paperclip, the U.S. government operation that brought Dr. Wernher von Braun, Dr. Anselm Franz, and other noted German Scientists to the U.S.A.

He became a U.S. Citizen in 1955 and in1956, he left Wright Patterson to be a test pilot at the newly formed turbine division of Lycoming Co. in Stratford, which was formed by fellow paperclip scientist Dr. Franz. At Lycoming, he worked as Chief of Flight Test Operations supporting the development of gas turbine engines for helicopters and aircraft until his retirement.

He also served as an FAA pilot examiner for glider private, commercial, and flight-instructor ratings for over three decades. He loved flying sailplanes and volunteered his time providing thousands of hours of flight instruction as an instructor with Nutmeg Soaring Association, a glider-flying club.

He was a guest speaker at the National Air and Space Museum and at the USAF Museum on numerous occasions. He periodically was asked to speak at local civic organizations and local chapters of the Experimental Aircraft Association and appeared on the television documentary series Wings of the Luftwaffe. He was a member of the Soaring Society of Dayton, Nutmeg Soaring Association, Soaring Society of America, Quite Birdman Hartford Hangar, International Order of Characters and The Society of Experimental Test Pilots. He was awarded the New England Soaring Council Flight Instructor in 1982, Honorary Fellow Society of Experimental Test Pilots in 1984, Aero Club of New England Connecticut State Award 2007. He was named to the National Soaring Hall of Fame at Elmira, N.Y. in 1994 and FAA Instructor of the Year.

New England. Survivors, in addition to his wife, Hanna, include his two sons, Martin Opitz, and

Michael Opitz and his wife, Nancy; along with his cherished grandson, Michael Anthony Opitz. He is also survived by several nieces and nephews in Germany. He was predeceased by three brothers and one sister. A memorial service will be held on June 3, 2010 at 10:30 a.m. in Union Cemetery, 23 Temple Court, Stratford. The Riverview Funeral Home, 390 River Rd., Shelton, are entrusted with the arrangements. In lieu of flowers, donations can be made in his memory to Macular Degeneration Foundation, Inc., P.O. Box 531313, Henderson, NV 89053 or Nutmeg Soaring Association (ref: youth scholarship fund / Rudy Opitz), P.O. Box 1179, Middlebury, CT 06762. To send condolences to the family, please visit www.riverviewfh.com. Source: www.legacy.com/obituaries/ctpost/obituary.aspx?n=paul-rudolf-opitz&pid=142633817

More History on Rudy

Born in Germany in 1910, Opitz learned to fly gliders as a teenager, and by the mid-1930s was working as a glider instructor at the Wasserkuppe flying school. After the outbreak of World War II, Opitz was drafted into the Luftwaffe as a glider instructor. He was later assigned as a test pilot to Alexander Lippisch and began working as a test pilot on Lippisch's tailless

Rudy in the cockpit of an early 163 at Peenemünde. Rudy was instrumental in the success of the DFS 230 assault glider attack on the fortress of Eben Email, May 10, 1940, for which he earned the Iron Cross, first class. He later became the chief test pilot for the entire Me 163 program.

glider designs. In 1941 he was assigned to Project X, the Luftwaffe's top-secret program to develop the Messerschmitt Me-163 Komet, the world's first rocket interceptor, which still holds the distinction of being the only rocket-powered airplane to enter combat**.** As Chief Military Test Pilot on Project X, Opitz made numerous flights in Me-163a and Me-163b interceptors. Although he did not fly any official combat missions in the 163, he did become Commander of the Me-163 equipped Second Group of JG400 towards the end of the war.

Nurflugel Bulletin Board Threads

(ed. – As I have noted in prior issues, this group hasn't had much activity lately. This is the only real thread other than information on Rudy Opitz's passing earlier in the month. I couldn't find any good still pictures of this aircraft so you will have to use some of the links to see them. I did have some difficulties with downloading a couple of them, and it appears others were having the same problem, so don't get frustrated.)

Some may enjoy this, 3 minutes long.

http://www.youtube.com/watch?v=C6CvycZux0E&feature=player_embedded

Bob Sisson

Back in the 1960's, several of us dreamed up something like this but with a larger span, higher aspect ratio and thinner wing. Think of an inflatable Marske Monarch weighing less than 30 pounds. It never got built.

We hoped to make the spars out of Kevlar reinforced mylar tubes filled with high pressure air. The airfoil would be inflated to a lower pressure. Fabric ribs would hold the airfoil shape. It would have been a glider without an engine and be foot launched.

The pilot would hang in a parachute harness below the wing with rope lift members attached to the harness at the hip and to the wing at about mid-span.

Pitch control would be by weight shifting. Turns would be by spoilers activated by pull ropes like a steerable parachute.

We hoped for an L/D of about 20 and a stall speed below 15 Kts.

BILDAN@COMCAST.NET

It would have been a glider without an engine and be foot launched. The original Woopy Jump has similar specs to those you describe, but a low AR -- it is a hang glider for skiers and turned with wing warping. I believe pitch control was by weight shifting. The website is only in French.
http://jump.woopyjump.com/

Rick Page

I take it the high-pressure spar would have provided adequate torsional stiffness?

Marc Piolenc

The spars are what gave us the idea. We were working with inflatable structures for another application. A 6" diameter tube inflated to 100 PSI is very rigid. The Kevlar reinforced Mylar is light, air tight and very strong - it could take up to 250 PSI. We would have used two or three spars in the wing.

BILDAN@COMCAST.NET

In case you haven't presented this: Richard Miller gives a lot of information about Taylor McDaniels flexible wing gliders in his book "Without visible means of support" at pages 37 to 42.

Peter Selinger

As far as the latest inflatable aircraft discussed in this thread, it looks like the airfoils are quite a bit thicker and the aspect ratios lower, which would help the torsional stiffness, as would a few well-placed battens and spars. However, I have trouble believing an
aerodynamic "blunt object" like that could achieve an L/D anywhere near 20:1. Bill, I assume the one you were working on was perhaps a little slimmer in those regards than the plane in the video, but then you have to worry about the stiffness issues again. I know what it's like trying to keep a bicycle tire inflated to 80-90 PSI, and trying to maintain 100 PSI in several flight-critical wing spars would be a significant safety-of-flight issue. You mentioned "two or three wing spars", I'd vote for at least three.

Don Stackhouse

People whose experience with inflatables is limited to tires and party balloons always look suspiciously on inflatable structures.

Designing high strength inflatable structures is a science - there's a learning curve to be climbed. Leaks are always brought up as a possible problem but they can be dealt with good material selection and design. Full time pressure monitoring helps too.

We found we could sit on the 6" diameter, 100 PSI tubes placed on sawhorses 15 feet apart. These were very light, stiff and strong structures.

Conventional structures fail catastrophically when overloaded Inflatable structures just flex and then return to their original shape with no permanent damage. I think you could safely design to a lower ultimate load factor with inflatables. Monitoring the strength of conventional structures is a problem. With inflatables, you just check the pressure gauges.

If the structure get stronger with greater gas pressure, atmospheric pressure changes at altitude aren't a problem as long as the internal pressures are large compared to the ambient pressure.

Would you rather have a metal tube and wire hang glider hit you on the head or an inflatable structure. Wouldn't it be nice to just deflate your glider and roll it up like an air mattress?

The real problem is the same as with fabric covered wood or aluminum structures - it's very hard to achieve an exact airfoil shape.

BILDAN@COMCAST.NET

Mitchell U-2 Bulletin Board Threads

I spoke with the current U2 plans seller and she suggested I get with you folks. So here I am.

I am an old guy who dabbled with powered hang gliders thirty years ago and I have always thought the Mitchell wing was a beautiful and interesting aircraft. I am building a Sonex but its first flight is years away and since I am less than 60 days from retirement I want to investigate buying or building a U2 to fly while I build the Sonex

Of course I have checked the 'net and looked at many pictures and read as much as I can find about the

aircraft. There do not appear to be many U2s out there so I am concerned about purchasing the parts I feel I am incapable of producing, like the pod and canopy. I am not a welder but I know the steel is available and I can always find someone with the skill for that. The 277 is no longer produced but they are available in the used market and there are suitable substitutes as well.

Are the folks on this forum now the suppliers of the parts? What can I anticipate for build time? Total cost? Any builder/owners in the central Georgia area? What is going on with the Mitchell LSA? Anything else I need to ask/know?

Brian Schoonmaker
<brianschoonmaker@yahoo.com>

Alex from Australia here,,,I bought a U2 about 20 years ago and half finished it ,,,then my life took a change [divorce etc etc., etc.] stored it at a friends place,,,,went and had a look at it the other week and have decided to cut the main spar in half and add a filler bit in there to take a two seater pod?????,,,,any comments from others who think I'm nuts will be well received,,,,also any comments on safely going about this project will be also welcome,,,,I've looked at paramotor engines [mostly single cylinders = big vibrations] so I'm looking at cutting the gearbox and bits off a Yamaha [or similar] 2 cylinder 2 stroke RD250 RD350 to give me 30HP to 39HP and weight around about 55LBS,,,,it all looks good in me mind and should work I've contacted a guy in Thailand who makes and supplies paramotor parts and he is getting back to me about buying the starter motor and ring-gear, also the re-drive cogs and bits from him,,,,,I just hope his prices are ok????

Alex Patrick [the 73 years young Auzzie],,,,
<a.pat@bigpond.com>

I think 20 years must be a record Alex. And now you are considering an extra twenty to widen it for two. Actually I believe it is a great idea and I have wondered for years why no one had yet done it. Good luck with that. Built per plans how long do you believe it would that a person (without your complicated life) to build it - assuming purchase of the pod, canopy and welded parts?

There are plenty of power plants available in that HP range so finding one, at least here in the states, would be pretty simple.

Nice hearing from, you. Please keep me posted on your progress.

Brian Schoonmaker

If you do a search you will find some threads on power plant options. One of the cheapest are snowmobile engines like Kawasaki 440A. It's a better option then cutting an RD 350 or RD 400, which is not intended for long hours of operation. Here's another option:

http://www.hobbyking.com/hobbyking/store/uh_viewItem.asp?idProduct=7503&Product_Name=DLE-111_111cc_Gas_Engine_11.2HP/7500RPM

Two of these will fly your U2. Four will really move it nicely, still weigh less then what you have in mind and these motors were made to fly! Just something to think about. Don't limit yourself. You have lots of options! And in time, more options come out, they cost less and are more reliable.

Ray Landa
<RaymondLanda@hotmail.com>

An engine for the U-2 is not my concern. There are many options available out there.

My concern, should I build, is availability of a pod and canopy since I have ZERO knowledge of how to make/mold them. Anyone know of suppliers for these?

That engine, by the way is very nice - perfect for a Lazair. If they doubled up on the displacement they could expand into the ultralight market if they wanted.

Brian Schoonmaker

Maybe You could find some engines on http://www.kohlerengines.com or some Briggs & Stratton. I found on YouTube nice video "homebuilt hero" with it.

Jiri
<blue.kid@atlas.cz>

This should be a good engine for the U2: http://www.compactradialengines.com/mz34.html
Or the Biboxter might be even better;
http://www.cosmo-

infinity.de/paramotor/front_content.php?idcat=40

Calle Hyllander
<carl.hyllander@bredband.net>

For the pod, use Rutan's moldless composite techniques. Simple and easy to learn. For the canopy, try Todd's Canopies or some other supplier if you have to have compound curves, or, if you're willing to settle for something a bit less aesthetic, use thin Lexan bent to fit the frame.

As you said there are several engine options depending on HP and $$$. The Paramotor crowd has lots of nice little engines as do the ultralight trikes.

Rick Girard
<jindoguy@gmail.com>

Thanks Rick. I actually spent quite a bit of time on Todd's site last night and based on all the canopies he showed he is certainly capable of producing one for the U2 if provided the dimensions or the actual pod.

Guess I will have to spend some time researching Burt's moldless technique. Do you have any websites that are particularly helpful? I guess another option would be to square it up a little and make everything symetrical and use plywood for skins but that still leave that pesky nose with the compound curves.

Thanks for the tips. You flying one or just interested?

Brian Schoonmaker

Aircraft Spruce has Burt Rutan's manual. <http://www.aircraftspruce.com/catalog/bvpages/moldless.php>@ less than $17 (US) it's a steal. I'm sure you can find a lot of info on the web, but this is the info from the master, himself. Once other projects are done, the trike and the Harley are sold and the new hangar is up I'll be buying plans from Carol and building a U2, too. Just too many irons in the fire right now.

Rick

Be advised that whatever you do about a pod and canopy, it's going to take a lot of work, thought, and invention. You first have to decide what to do about a seat. The plans don't tell you. Then you have to enclose a seated pilot inside, with room to do what he/she has to do. Your weight budget is extremely limited. Visibility is a factor.

Given the plans and a kit, a few successful builders have managed to get a satisfactory pod/canopy that is probably as light as you can get. I came up with an alternative with formers, sticks, and 1 mm ply that used a flat wrap canopy. It looked like the pictures of the "Victory Wing". Whatever you do, however, there will be a lot of adapting and invention. There is no "off the shelf" solution.

Dave Gingerich (been there, done that)
<dgingerich@cox.net>

Glad to see you are back at the project after so many years.

I'd be very careful about simply cutting the wing in half and widening it. The original was designed for something like a 9G ultimate load, which sounds like a lot, but you have to keep in mind that the original weighed less than 250 pounds. Also I'm pretty sure that the calculations took into account the fact that it is basically a flying wing, the wing weigh being a significant percentage of the whole weight and can be subtracted from the overall weight for calculations.

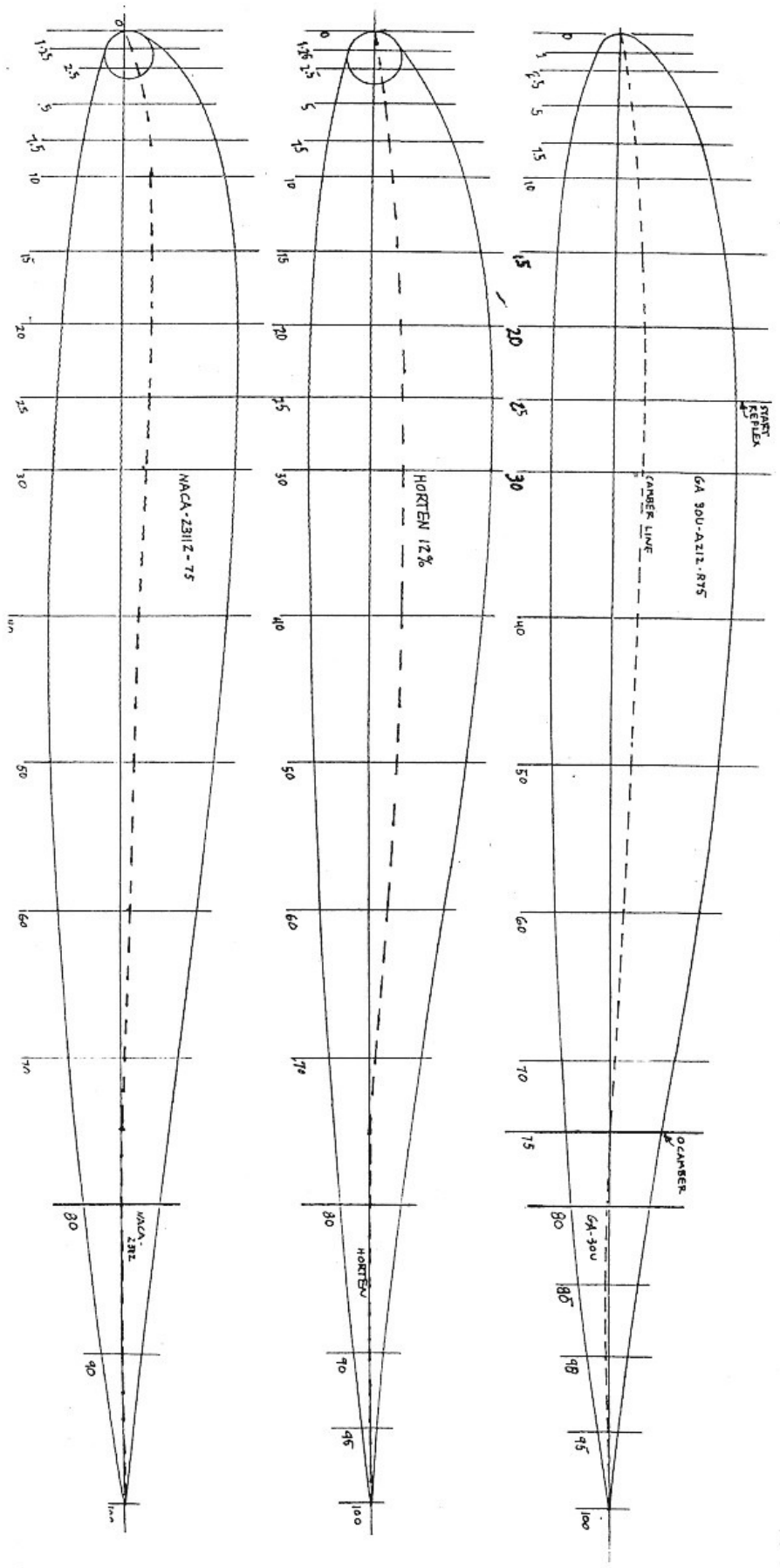
By adding more mass in the center of the wing you are changing this ratio significantly. Subtracting 200 pounds of wing weight from a single place designed for 450 pounds gross weight (arbitrary but close numbers) is a lot different than subtracting 225 pounds of wing weight from a 2 place with a gross weight of around 625 pounds.

While I believe the wing as designed - might - be able to handle the added weight with a reduction in limit load getting all of the loads passed through the rather small spar caps to the new center section may prove to be a real challenge.

As for the pod construction I'd suggest looking for a nearby EAA chapter and dropping by to talk to some of the other builders. Making a pod isn't really hard, you just need to decide on the construction method and then put in the time to do it.

I like glass, others like to work in wood and maybe even a tube and fabric nose like the old Schweizer SGU 2-22 sailplanes might work for you?

Leon Casper
<leoncasper@hotmail.com>



Left: 3 stable airfoils.
Below: Stations for airfoil used on 36" RC LARA Mk 5 free flight model. Model is quite stable and also very maneuverable in all flight conditions including inverted.

GA-3OU-A212-R75 STATIONS

STA	CMBR	UPPER	LOWER
0	0.000	0.000	0.000
.25	0.067	0.939	0.805
.50	0.132	1.354	1.090
.75	0.184	1.669	1.301
1.25	0.276	2.170	1.618
2.5	0.471	3.085	2.143
5.00	0.772	4.326	2.782
7.5	1.006	5.206	3.194
10	1.193	5.875	3.489
15	1.469	6.814	3.876
20	1.648	7.386	4.090
25	1.753	7.695	4.189
30	1.800	7.802	4.202
35	1.62	7.57	4.28
40	1.519	7.28	4.28
45	1.37	6.97	4.17
50	1.26	6.42	4.14
55	1.11	5.85	4.00
60	0.86	5.25	3.82
65	0.60	4.62	3.65
70	0.35	3.88	3.37
75	0.00	3.14	3.14
80	-.101	2.42	2.80
85	-.202	1.77	2.26
90	-.15	1.14	1.71
95	-.101	.628	.971
100	000	0000	0000