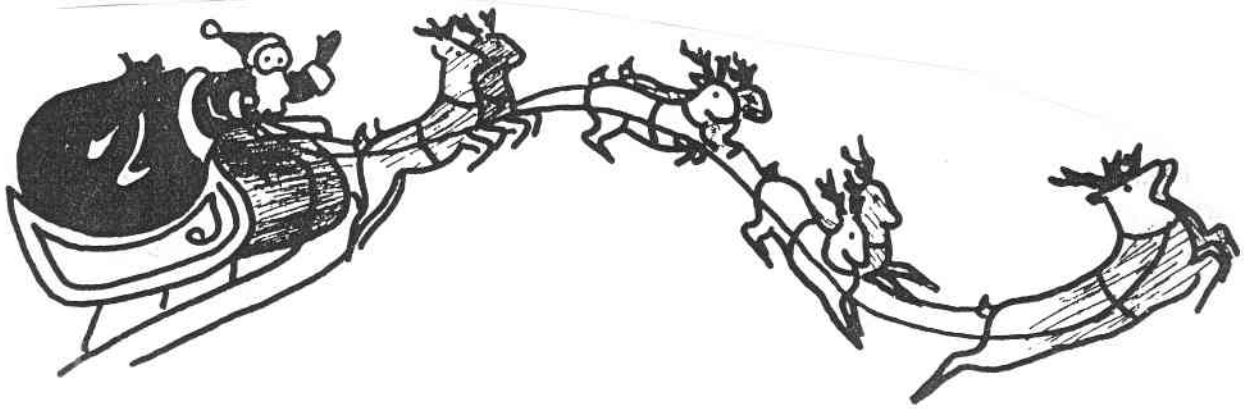
No. 114 DECEMBER 1995

T.W.I.T.T. NEWSLETTER

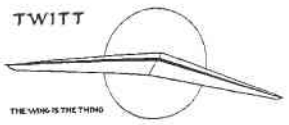


Merry Christmas and a Happy New Year

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

The number to the right of your name indicates the last issue of your current subscription, e.g., **9512** means this is your last issue unless renewed.

Next TWITT meeting: Saturday, January 20, 1996, beginning at 1330 hrs at hanger A-4, Gillespie Field, El Cajon, CA (first hanger row on Joe Crosson Drive - East side of Gillespie).



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

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

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Meetings are held on the third Saturday of every other month (beginning with January), at 1:30 PM, at Hanger A-4, Gillespie Field, El Cajon, California (first row of hangers on the south end of Joe Crosson Drive, east side of Gillespie).

TABLE OF CONTENTS

President's Corner	1
This Month's Program	2
Meeting Minutes	2
Letters to the Editor	4
Available Plans/Reference Material	6
Flying Wing Sales	8

PRESIDENT'S CORNER

No, it's not your imagination, the newsletter is about a week late this month. I had to make a business trip the week it was due for preparation, so everything got put back a week. It did allow for a few more letters to come it, so not all was lost, and fortunately there is no meeting this month.

The entry of the TWITT Library into the computer is now back on track. The software problem has been resolved and Craig and Nancy have it back and are resuming the data entry. We do not have a projected completion date, but will keep you informed.

For those of you interested in computer design airfoils, we still have several of the booklets Phil Barnes produced for his September presentation. These are accompanied by a VHS video of his talk all for the reasonable price of just $10 postage paid in the U.S. (Add $5 US for airmail to overseas destinations.)

As were getting ready to go to press, Bob informed me that Alex Strojnik, one of the early TWITT members, had passed away at his home in Arizona. This is a great loss to the home building movement and the aviation community in general. Alex contributed his talents through books, lectures and developing simple homebuilt plans. Bruce Carmichael will be preparing an obituary for Sailplane Builder which we will pass along when it is available.

Bob wanted me to remind you that back issues of the TWITT Newsletter would make an excellent Christmas present for yourself. All you have to do is leave a note around (cleverly listing those issues you would really like to have to complete your library) for your significant other to find. Make sure a copy of the newsletter is handy with the mailing address and costs to make the ordering as easy as possible. As late as it is, you may not get them on Christmas day, but just think of what you would have to look forward to on New Year's Day instead of watching football games (for those of you who "aren't" sports nuts.

Have a Merry Christmas and Happy New Year.

Andy

JANUARY 20, 1996 PROGRAM

As of publication date we have not firmed up a program for January. The last two programs are going to be hard to follow, but we will do what we can to put together a good one for you.

MINUTES OF THE NOVEMBER 18, 1995 MEETING

Andy opened the meeting with the usual housekeeping items, which included thanking **Chris and Connie Tuffli** for the apple and pumpkin pies with whipping cream for the day's treats. They were delicious and in keeping with the Thanksgiving holidays.

After everyone introduced themselves (we had 25 members and guests present), Bob Fronius took the floor to make a couple of announcements. In keeping with the day's program Bob reminded us that many years ago one of our members, Tasso Proppe, had tried to develop an ultralight that could be completely handled by one person, however, time overcame the project. He then went on to briefly cover that the plans for a west coast monument to soaring will be dedicated by the National Soaring Museum in April 1996 at the Point Loma site which was established last year.

Bob also gave us a little history lesson covering the time before the Wright Brothers when a man named Herring was flying a manned CO_2 powered hang glider. According to Bob he later went on to help the Wright's with their aircraft.

Bruce Carmichael told the group that Alex Strojnik had passed away. He was working on his fourth book and had about 400 pages completed which apparently only part of what he wanted to say. Bruce thought that Alex's son would be finishing the book sometime in the future.

Before beginning the program, Andy thanked Chuck Rhodes (our speaker), **Floyd Fronius** and **Pat Oliver** for bringing in and assembling the aircraft that were on display outside the hanger. Floyd brought the Fledgling and Apex, while Chuck brought his Mitchell Wing and Icarus V hang glider.

Andy then introduced **Chuck Rhodes** who would be giving us a historical and future look at the sport of hang gliding.

Chuck began be telling us little about his background and how he got started in the sport. He is Navy Medical Service Corp Officer specializing in environmental health and is the Executive Officer of medical unit that is responsible for setting up field medical units.

As a snow skier he found a great thrill and exhilaration in jumping through the air. This progressed to the point of acrobatic jumping and the thought of getting into sky diving. However, his brother intervened one day by asking him to come hang gliding. His first experience with an old style Rogallo going down a training hill in 50' airborne leaps convinced him that this was the real way to get into the air.

ABOVE (left to right): Randy Bergum, Mark Motley & son, Floyd Fronius, Chuck Rhodes (the day's speaker) and Bob Chase standing in front of the APEX rigid wing hang glider. The leading edge is a composite structure D-tube with dacron cloth and ribs forming the airfoil. Photo by Andy Kecskes.

He was so hooked he borrowed all the money he could, bought four different hang gliders and opened his won flight school, the original Adventure Sports in Flagstaff, Arizona. In 1974 he took a trip to Sylmar, CA and came across Taras Kiceniuk and his Icarus V. He watched as Taras took off, in his rigid wing hang glider, out climbed everyone and stayed up longer. At this point Chuck knew this was the type of glider for him. He has been hooked on rigid wings ever since.

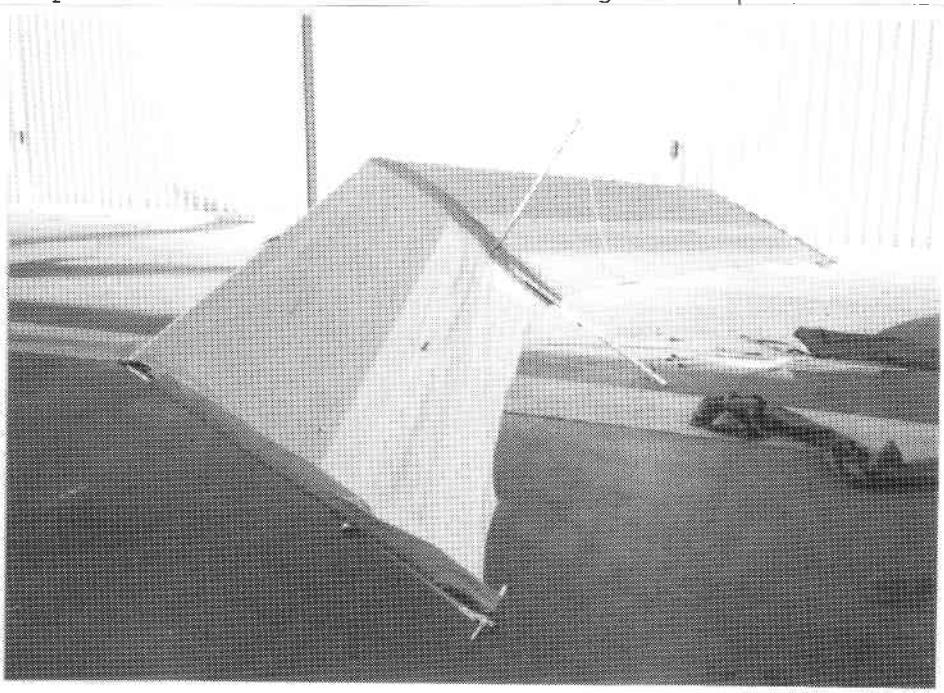
With that we closed the hanger doors and fired up the slide projector to start the historical overview of rigid wing hang gliders. Chuck first thanked Randy Bergum for lending he some the pictures we would be seeing during the presentation.

He started with the standard Rogallo which help get a lot of the younger pilots into the sport in the early years. He moved on to the Green Machine which was typical of some of the early rigid wing types that were ground skimmers and kind of low and slow, but they

would get you into the air although they didn't have much performance.

Chuck proceeded through a series of slides that showed some of the early designs and the variations that were included to try and increase performance. Since he had not flown many of those shown, he could only speculate about the effectiveness of things like end-plates and winglets.

The Icarus V then came along as a true rigid wing that could soar and thermal. It is all aluminum construction, with a real light weight J.C. Penny 100% polyester sheet lining, heat shrunk and doped for the covering, with an all-up weight of about 65-70 lbs. It was very easy to fly and had a swing seat hung below the center of gravity and twist grips that actuated the tip rudders. (ed. - Watch out here come the computers again.) Kiceniuk used a computer for the high lift, low pitching moment airfoil that incorporates 20° of sweep and 7° of aerodynamic twist in a 5' chord, 150 sq.ft. area wing. It was advertised at a 10:1 glide ratio, which Chuck thinks is somewhat low compared to state of the art flex wings.



ABOVE: Floyd Fronius' Fledgling flying wing hang glider without the tip rudders installed. This is an all cloth design with ribs to maintain the airfoil shape. Photo by Andy Kecskes.

Bob Chase said that Taras had told him the Icarus V was stressed for 12 G's, and Chuck said that he had flown it in some very rough air and never had any structural problems. He also went on to say that it is very stable and has a tendency to right itself.

Chuck felt one of the reasons the Icarus V didn't gain more popularity was due to its size when trying the transport it and the longer setup time. This led to many pilots going back to flex wings which could be compacted for transport and were somewhat less cumbersome to assemble at the flying site.

Then there were the more traditional styles, namely those of Volmer Jensen with his VJ-23 & 24. These had standard 3-axis controls along with weight shift for pitch control, but were light enough to be foot launchable.

Chuck went through a series of slides that showed a number of different models of rigid wing hang gliders that appeared over the years. He didn't have much comment about most since he had not had a chance to fly them.

He finally came to the Mitchell Wing which he feels is one of the best hang gliders ever built. This wing was the result of a desire by Dr. Howard Long of San Francisco to develop a higher performance hang glider in the mid-1970's. He contracted with Don Mitchell to come up with an aircraft, and the Mitchell Wing was born. The early model didn't have the wing-tip rudders so turning control was achieved through the use of spoilers.

Some of the early models had trouble during the launch sequence because of the spoiler's effectiveness, which led George Worthington to having Don Mitchell add the tip rudders that are now standard on the Mitchell Wing.

One of the things that Chuck likes about the Mitchell is that the control systems provide a certain amount of redundancy since it has the rudders and elevons. He noted that the rudder connection had failed one time on a pilot, but he was able to fly the aircraft safely with just a little more slipping during turning maneuvers.

About this same time the Easy Riser came out which gave the Icarus V competition since it had similar performance, was easy to built and easy to build.

In the early 1980's, Chuck found an ad in the paper where George Worthington was selling his personal Mitchell Wing. George wanted to make sure the right person bought the airplane and Chuck had the right background of flying experience so became the proud owner of the Mitchell Wing he had on display at the meeting.

Over the years Chuck has made many modifications to the pilot accommodations to make it more comfortable to fly for long periods. He has replaced the original front landing wheels with a set of rear wheels on a spring axle arrangement and installed a single nose wheel.

One of the projects Chuck showed was the Cherry Wing which was being built by Henry Cherry in Georgia. It was a Horten style wing which would be flown in the prone position. However, the project was never finished and Chuck could never make contact with Henry to find out what happened.

Chuck came back to the Mitchell Wing that

was built by Randy Bergum (a TWITT member and in the audience today). Randy tried a number of different things during the construction to improve Don's design, reduce the weight and make it more damage resistent during landings and transport. After Randy finished it, Chuck had a chance to fly it once and felt that addition of wing tip extensions and 3° of aerodynamic twist in the outboard panels significantly improved the L/D over his original wing.

Chuck wrapped up his presentation expressing his opinion on the future of rigid wing hang gliders. He feels that they are on the come back as evidenced by the SWIFT with its 25:1 glide ratio from a foot launch. With the advent of new technologies and composite materials, and the ability to tow behind vehicles and airplanes rigid wings will continue to grow in popularity because of their higher performance capabilities. He also thinks that these types of ultralight aircraft will help restore the pure joy of the flying experience.

ABOVE: Chuck Rhodes Mitchell Wing formerly owned by George Worthington. Note the modified pilot's cage with the single nose wheel and dual rear wheels which make landings much easier in no wind conditions. Photo by Andy Kecskes.

After thanking Chuck for his excellent coverage of rigid wings, Andy conducted the day's raffle. **Mark Motley** won the door prize of a Buomoiliad plant donated by Bob Fronius and June Wiberg, along with a surge protection extension cord raffle prize (but he still hasn't won the Lottery). **Dominique Veillard** won a bottle of liquid car wash, and **Randy Bergum** walked away with a pair of cans of Gunk for washing off greasy things.

The meeting was then adjourned to outside where everyone could walk around the Fledgling, Apex, Icarus V and Mitchell Wing and ask all the questions they could think of. Chuck and Floyd remained to answer these questions until almost the last member left. For that we thank them both for their assistance in making this an interesting program for everyone.

LETTERS TO THE EDITOR

12/2/95

TWITT:

My YV-49 is in a new home as I continue work on it. The control systems should be complete in a week or less, (today I am borrowing a nicopress to install the control cables) and the fuel system is getting the hoses clamped on this weekend. The brakes are all done but I will put in fluid after I safety wire the drag rudder turnbuckles. The nosewheel steering work and wires to most of the lights are in place.

The instrument panel goes on next week.

In two weeks I get the engine mount and my bubble canopy, both of which should keep me busy till Christmas.

I have also applied superfill to the exterior and I hope to finish the sanding in about a month. The inspection panels go on in a couple of weeks, as soon as I trace the paper templates and cut and drill.

It will be ready to paint before spring.

I have sent photographs and specifications to Rudolf Storck for his book and I hope to be flying by summer.

Sincerely yours,

Barney Vincelette

(ed. - We have printed your pictures on the following page. It is good to see that you are continuing to progress at a rapid pace on your project. The resemblence to the original YB-49 is very obvious in the pictures, especially with the vertical fins. The bubble canopy will really add the final touch to the look alike picture. We will look forward to seeing the pictures of it flying next summer.)

ABOVE & BELOW: Barny Vincelette's YV-49 which originated from a Gilbert Davis design.

10/19/95

TWITT:

Here's my renewal. You're pushing my learning envelope, The current issue is almost beyond me because I don't know computereze. But keep it up.

Yours,

Keith Hauke

(ed. - First of all, thanks for the renewal. Secondly, I think the heavy computer stuff is probably over for the time being, although there is a little more from Phil Barnes in this issue.

We hope that by introducing members to these types of things we will spark their interest in learning more about something new. With the cost of home computers and design software coming down every day, the possibilities of using them to finally get started on your dream project should always be a consideration.)

11/10/95

TWITT:

Thank you very much for your large express mail envelope with a lot of very interesting information I believe will be very good for planned publication. It was very helpful that you sent the information so fast and I will give back the cost of the express mail.

As I mentioned before, I am very interested in any new information about the NASA Waverider as shown in No. 113 newsletter.

Once more, thank you very much for your kind help and support.

With best regards,

Rudolf Storck

(ed. - We sent a lot of information to Rudolf while he was on vacation in Florida which significantly reduced the mailing fees, since he lives in Germany.

We will keep a lookout for more information about the Waverider and get it to him. If any of our member's should come across some, please let us know, or send us a copy, and we will get it to Rudolf.)

PHIL BARNES UPDATE

Three pages of additional material from Phil Barnes, especially the preliminary results of limited wind tunnel testing of his own airfoil.

Also included in the material are two new charts which were not published in the book of charts and graphs he presented at the September meeting. (All of this will be included in the January 1996 newsletter since I ran out of space this month with the updated membership roster.)

Phil also sent along several additions to the TWITT Library. They are:

"The Wing Flies Again", by Stuart F. Brown, Popular Science, November 1995, pp.73-75. Briefly covers the restoration of the Northrop N9M-B at the Planes of Fame air museum in Chino, California.

"Exploring Aerodynamics", Arizona Engineering, Spring 1995, pp. 9-11. A short article on the life and time of William Sears who was one of the Northrop engineers responsible for the flying wing program.

"Flying the Batplane at the 1995 Standard Class Nationals", by Karl Striedieck, Soaring, November 1995, pp. 38-39. An account of flying the Genesis at the standard class nationals with some of his impressions of the aircraft.

"A Vision of a Plane", by Andre Mouchard, The Orange County Register from Long Beach, publishing date unknown. An article on the McDonnel Douglas Blended-Wing Body, 800 passenger transport projected for sometime around 2005 or later.

(ed. - We would like to thank Phil for the updated information on his math characterization program and the articles.)

ABOVE: Bernie Gross' Deaf Hawk Marske Pioneer flying wing on display at the SHA Western Workshop in Tehachapi, CA over Labor Day weekend 1995. Photo by Andy Kecskes.

AVAILABLE PLANS & REFERENCE MATERIAL

Tailless Aircraft Bibliography

by Serge Krauss

4th Edition: An extensive collection of about 2600 tailless and over 750 related-interest listings. Over 15 pages of tailless design dates, listing works of over 250 creators of tailless aircraft, and the location of thousands of works and technical drawings for the Ho 229 (IX), Me 163, & Me 262.

Cost: $23 (Domestic)
$32 (European destinations)
$35 (Asia/Australia destinations)

Order from: Serge Krauss
3114 Edgehill Road
Cleveland Hts., OH 44118

Tailless Tale, by Dr. Ing. Ferdinando Gale'

Consists of 268 pages filled with line drawings, tables and a corresponding English text. It is directed towards modelers, but contains information suitable for amateur full size builders. Price is $38, postage and handling included (also applies to Canada and Mexico).

You might also want to purchase his new book **Structural Dimensioning of Radioguided Aeromodels**, priced at $18.00.

On The Wing...the book, by Bill and Bunny Kuhlman (B^2) is a compilation of their monthly column that appears in RCSD. Many of the areas have been expanded and it includes coding for several computer programs to determine twist and stability. Priced at US$28.00.

All these are available from B^2 Streamlines, P.O. Box 976, Olalla, WA 98359-0976, or (206) 857-7249 after 4pm Pacific Time. Orders shipped elsewhere will be sent surface mail unless an additional $10 is included to cover air mail postage. Washington residents must add 7.5% sales tax.

Personal Aircraft Drag Reduction, by Bruce Carmichael. This 207 page, soft cover, 8½ x 11" book starts with a chronological history of experimental verification of large theoretically predicted drag reductions on aircraft components having extensive laminar boundary layers. Practical problems which