

T.W.I.T.T. NEWSLETTER



This is the Nighthawk 1 (Phase 1) landing in Florida. It has bird like controls with wing twisting. Although difficult to see in this picture, there is a Soarmaster engine and propeller pushing it along (you can just barely see the long shaft extension sticking out past the aft end of the birdlike tail surface. For more information on this fascinating machine see page 6 inside. (Photo courtesy of Jim Theis.

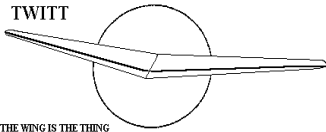
T.W.I.T.T.

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., 9908 means this is your last issue unless renewed.

Next TWITT meeting: Saturday, September 18, 1999, 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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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).

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PRESIDENT'S CORNER

When it rains it pours. This month I have enough material for almost two newsletters and it is all very good. Therefore, I went ahead and split the July meeting minutes into two parts so other information that has come in over the past several weeks could be included this month. Keep those cards and letters coming, since they will all find their way into the newsletter at some point in time.

I want to apologize to those of you who have been looking for new information on the website, since there hasn't been any for quite a while. I have been very busy earning a living and working on a 2 1/2 day professional organization conference here in San Diego. However, the conference is now history (over 200 attended) and I will be able to get back to work on the website in the next several days. I have some new links to add that are very exciting and I will be adding a section on the Nighthawk shown on the cover this month.

Speaking of links, make sure you keep an eye on the Marske pages so you can stay informed on when the next construction workshop will be held. Even if you aren't building a Pioneer, I am sure the techniques would be useful for any project.

Don't forget to read the material on the SHA Western Workshop being held over the Labor Day holiday. There are always a few flying wing types there, especially within in the ranks of the hangglider group. See you there.

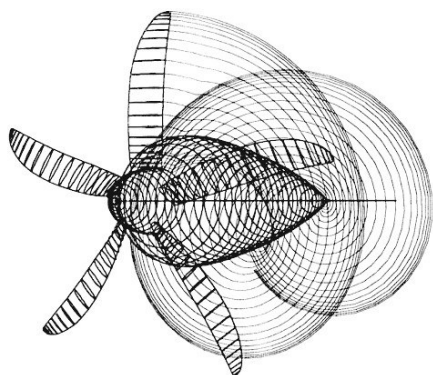
As you can see from the program announcement, we will have a very interesting presentation by Phil Barnes next month. Right now we have Robert Hoey lined up for November for one of his informative talks on bird flight and how it relates to flying wings. I have heard many good things about Robert's talks, so I am looking forward to this one. Are you listening out there Phillip??



SEPTEMBER 18, 1999
PROGRAM

We have a good program for you next month. At our September meeting, **Phil Barnes** will draw from his recently published SAE paper on propeller geometry and aerodynamics. The presentation will include the significance of the various propeller performance characteristics, show the effects of the number of blades, review the work of the classical aerodynamicists, and show contemporary, math-modeled propeller and wake geometries. We will have further details of the presentation in the September newsletter.

Make sure to mark your calendars now for the date, because I think this is going to be the definitive program on propeller design. Someone make sure to bring Gene Larrabee along to keep Phil on his toes.



MINUTES OF THE
JULY 17, 1999
MEETING

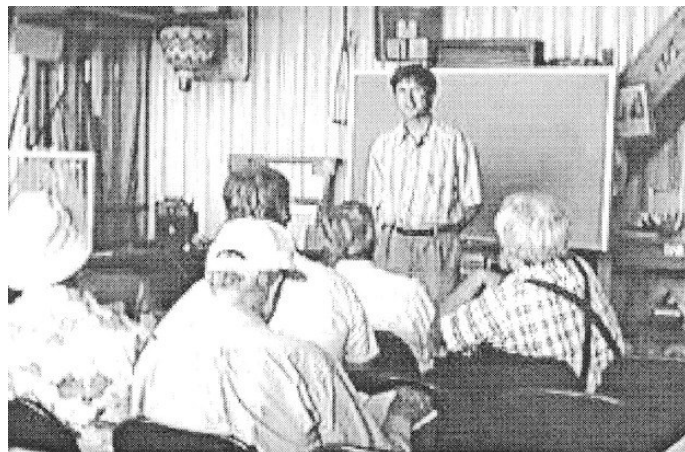
The meeting got started a little later than usual due to the heavy traffic on I-5 slowing down that arrival of our speaker, Taras Kiceniuk. All was not lost though, as everyone present had a good time hanger flying and having a cool drink to stave off the heat.

Taras finally arrived and Andy called the meeting to order. The plan for the day would be to get completely through Taras's presentation and then break for birthday cake and ice cream.

In case some of the group had not heard yet, Andy announced that Bill Ivans, well known in the national and international soaring community, was killed in a glider accident on July 13th at Minden, NV. He was flying his Nimbus 4DM, along with passenger Donald Engen, head of the Smithsonian Institution's National Air and Space Museum. There is no definitive explanation from the NTSB at this time, but they do know the outboard wing tip panels departed the glider, the wings disintegrated and the fuselage dove into the ground. Just before these events the glider was observed recovering from high-speed spiral,

and other pilots noted there were very turbulent conditions in the area at the time. *(ed. - Bill was a long-time family friend and I had crewed for him several times many years ago. My family and I are saddened at his loss and extend our sympathies to Bill's family.)*

Andy then showed the group two books we had recently received. The first was Serge Krauss' compilation of A.R. Weyl's patent statements which included a number of items the TWITT library does not contain. We would like to thank Serge for donating this copy to the library. For those interested in historical things, Serge is also trying to put together the works of G.F. Meyers, so if anyone has information they would like to contribute, please contact him. Specifically, he wants to know whether Myers actually built and/or flew an annular quadruplane sometime during the period of 1904-1911. He has found some poor quality pictures that would seem to indicate this was the case, but needs more positive proof.



ABOVE: Taras beginning his introduction of dynamic soaring to the group.

The second was a beautifully prepared, hard-bound book authored by Alain Pelletier, that is unfortunately all in French. It is titled "Les Ailes Volantes..." (The Flying Wing - World History of Flying Wings and Tailless Aircraft) and published by E-T-A-I, ISBN 2-7268-8444-X and had 190 pages. It contains some historic flying wings we don't ever recall seeing before, and member Dominique Veillard has offered to translate some of the more interesting ones for us to put in future newsletters. Serge also has a copy and indicated he would be digging into his French-English dictionary to translate some of the material himself.

Andy asked Pat Oliver to explain how the sculpture of an Icarus II hangglider came about. Pat said he had designed and built it in 1977 when he was a young hangglider pilot. It is made out of copper sheet, brazing rod and a wire framed pilot filled with sodder. He has it mounted on a piece of driftwood on a board with a very nice plastic cover that really sets it off. He had brought it with him today to have Taras (its designer) autograph it.

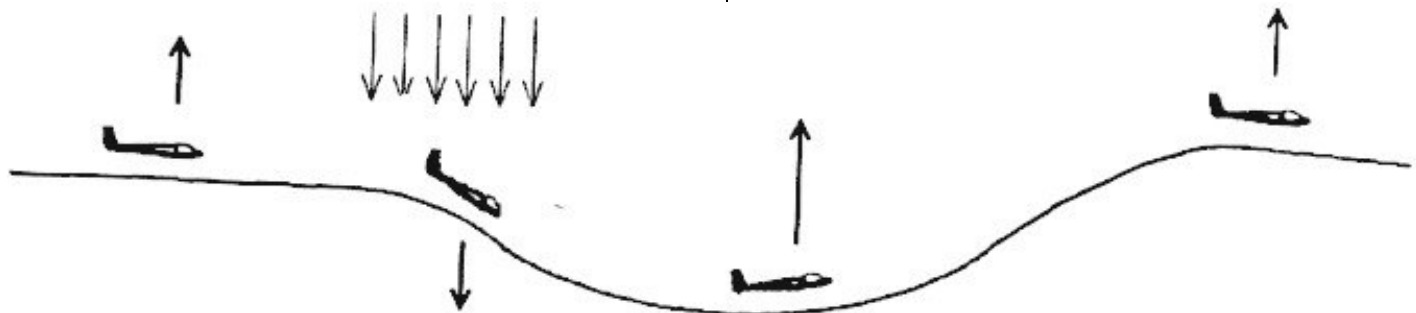
Since no one from the audience had anything further to offer the group, Andy introduced Taras Kiceniuk who would

tell us about his theories on dynamic soaring through areas of sinking air and along shearlines.

Taras started by telling us that the concept of dynamic soaring has been around for a long time, but that it has not really been explored to the extent he has tried to at this point. Ed Lockhart asked Taras to define dynamic soaring, to which he replied that instead of using the continuing up currents of air you use the mass of the glider to interact with different airmasses to generate energy. He related this to the albatross soaring over the water for hours and days on end (this goes back to the video Bruce Carmichael showed us at the last meeting). He did mention that some types of dynamic soaring would be difficult for human pilots due to the proximity with the ground and the need to make rapid changes in attitude to produce the resultant energies. The birds can get away with it, especially over the water where changes in conditions are more predictable than over land.

the sink hole we “bounce” off the surrounding stationary air by pulling back of the stick and zooming upwards (at more than one gee). Obviously this can only work if the “sink hole” is fairly small, because we can spend just a short period of time in negative gee before building up excessive speed. (So there is a catch after all!) But the situation is not so farfetched as all that; often there is strong sink on the edges of thermals where we can get a bit of downwards push and get right back into the lift. The downward push can come from a bank angle of greater than 90 degrees rather than negative gee and “bouncing” back off upward moving air is much more energizing than bouncing off still air. This is a dramatic and practical example of dynamic soaring. The bad news is that dynamic soaring can result in a rough ride and vigorous maneuvering, as its name would lead one to believe.

Let’s take a look at sailplane energetics. An understanding of vectors and vector math can be very



ABOVE: This is a schematic of the maneuver Taras has been explaining about getting energy out of the sink pockets. He noted if you encounter another sink pocket during the upward movement it is a good place to repeat the cycle.

Taras used an analogy to kites and sail boats to help explain the basics of dynamic soaring since they involve objects moving in different directions in relation to the movement of the air around them. For a kite, it is attached to the ground by a string and a force is generated as the air moves over it. Basically, anytime there are two things moving with respect to each other there is potential to get some energy out of the relationship. It is just a question of connecting the two things together in such a way that you use the inertia of one object to extract the energy from the other part. Another quick example was a ping pong ball bouncing between two paddles. If the paddles are used normally they are moving towards the ball when it hits transferring energy to it. This is similar to a glider “bouncing” off of a shear line or an area of sink.

(ed. - At this point, Taras introduced the group to his latest series of papers on the subject. So I have taken the liberty of using them to continue with the minutes since they explain Taras’ concepts better than I could translate the verbal presentation.)

How can a sailplane use a bounce to soar? Assuming we are flying fairly fast in an approximately wings level attitude and it an area of strong sink, we can push the stick forward and go into negative gee so that the **downward** moving air push us **downward**. Then as we come out of

helpful when working in this area, but we’ll try to keep things from getting too “hairy”.

The rate that energy is gained or lost can be called power; it can be positive or negative. When the glider is getting more energy let’s call that positive power and when it’s losing energy let’s call it negative power or loss.

In vector math terms, the power going into the glider is the “dot” product of the velocity vector and the force vector. A dot product is a measure of how much two vectors point in the same direction, if they point in opposite directions the dot product is negative. If the vectors are perpendicular the dot product is zero.

Now back to soaring. To get the most power from the atmosphere we want the air to push our glider in the same direction that the glider is moving as much as possible. The way that we normally do this is by spending as much time as we can in upward moving air, where the air is pushing the wing upward and the glider is moving upward. The faster we are moving upward the greater the power of energy transfer. The upward force of the air on the wing averages out to be the weight of the glider.

We can also look at the challenge of getting energy in another way. The conservation of energy law tells us that instead of concentrating on how much energy the glider is getting, we can look at how much energy the atmosphere is losing. The two are equal (when we consider the glider’s drag losses) and the second way of looking at the situation can be more instructive and conducive to understanding dynamic soaring.

How do we make the atmosphere loose energy? By pushing on the air in a direction opposite to its motion! But first let's clarify our terminology, the energy we are talking about is large-scale kinetic energy due to air motion, which is the kind of energy a sailplane can use. Heat energy and micro-turbulence are of little use (that's where the sailplane loses energy via drag).

Once again, to make the atmosphere loose energy we push the air **opposite to its direction of motion**. As the atmosphere loses energy the sailplane gains it! In what direction can a sailplane push on air? Well - in any direction. The wing of a sailplane is designed to push on air in a direction perpendicular to the wing surface and towards the landing gear. The wing can also push in the "negative gee" direction (away from the landing gear), but the airfoil is less efficient when used that way. By banking and maneuvering the glider we can orient the wing to push air in any direction: up, down or sideways.

To make use of the energy in upward moving air we can use the downward force of gravity to push on the air. To push on air that is moving in other directions we can make use of the glider's inertia. Inertia is the property of mass that causes a body at rest to remain at rest and a body in motion to remain in motion. When a massive body's motion (velocity) changes a push (force/impulse) is exchanged between the body and its surroundings. When a body's inertia carries an impulse over a distance it is in the form of momentum.



ABOVE: This is our birthday cake with a likeness of the Blended Wing Body (BWB) we covered recently. Too bad it is not in color, since it was really pretty and filled with lots of yummy fillings.

In the case of a glider there are three kinds of forces in action; gravitational forces which act between the glider and the earth; aerodynamic forces which act between the glider and the surrounding air, and; inertial forces which appear when the glider changes speed or direction. The aerodynamic and inertial forces are the ones we play around with when dynamic soaring. By pulling back on the stick we can increase the aerodynamic force; by pushing forward we can reduce or reverse the force. By banking the

glider we can tilt the aerodynamic force sideways. As we maneuver, the inertial forces vary in magnitude and direction so as to remain opposite to the glider's acceleration. The total (vector) sum of the three types of forces is always equal to zero. This is to say they continually cancel each other out.

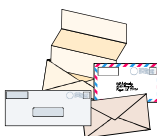
By using the glider's inertia we can push on air in any direction at least for a short length of time. This time equates to about 4 seconds when applied in a sideways direction. But if we wanted to use the inertia to push upward on downward moving air we would be limited to 2 seconds because then both the aerodynamic force on the wing and gravity would be accelerating the glider downward.

How much energy (or power) is available from moving air and how efficiently can a wing extract the power? To answer this question we first must clarify what we mean by "moving". Motion is relative; and in order to get energy we must be able to access both parts that are moving relative to each other.

Remember earlier we talked about the kite with a string attached to the ground, well gravity sort of provides the downward pull that enables us to get energy from upward moving air. Inertia and momentum can provide a sort of temporary dynamic string that allows us to get energy from the relative motion of air masses in any direction, so long as the distances involved are not too great. The distances depend on how clean the sailplane is, with a high performance ship using its inertia to carry momentum over longer distances than a draggy ship.

The distance that a particular ship can effectively carry momentum before the drag losses eat up any potential dynamic soaring gains defines an area of operation, which can be specified in terms of distance or in terms of a time interval. If one is circling, distance may prove most significant; when flying in a more or less straight line, time may prove to be a better parameter. The (possibly weighted) average motion of the air inside the dynamic soaring operations area defines a **local inertial reference frame**.

(ed. - This is a good breaking point to allow for some room in the newsletter for pictures and diagrams that everyone seems to like so much. The minutes will continue to their conclusion in next month's newsletter, so stay tuned.)



LETTERS TO THE EDITOR

7/15/99

TWITT:

I have just received the July issue of the newsletter and I was interested to see on page 3 the photo of the French aircraft with the text coming from Alfred Worsfold. The aircraft is the S.E. 2100 for which the information I have are as follow :

Designed during W.W.II by Mr. Pierre Satre. Twin-seated with rear engine Renault 4 Pei - 140HP. The test pilot was Mr. Pierre Nadot (test pilot of the S.N.C.A.S.E.) and it made its first flight the 04-Oct-45 in Toulouse. For your information, Mr. Pierre Nadot was also the main test pilot for the SE-210 "Caravelle" (passenger aircraft with twin rear jet engines) and Mr. Pierre Satre was one of its designer. The aircraft was still existing in 1952 but I have no information on what happens with this aircraft after.

| | |
|-----------------|--|
| Wingspan : | 9.89 m |
| Length : | 4.92 m |
| Wing area : | 15.11 m ² => 53 Kg/m ² |
| Weight empty : | 518 Kg |
| Total weight : | 800 Kg |
| Max. speed : | 230 Km/h |
| Landing speed : | 90 Km/h |
| Range : | 500 Km |



I have 2 photos. The first photo is coming from the book Histoire de l'aéronautique Française - L'épopée 1940 - 1960 written by Mr. Jacques Noetinger (publisher : France-Empire - ISBN 2 7048 0205 X). (For your information, he is a specialist of the French aircraft, collaborated on various periodicals specializing on aircraft and was speaker in numerous aircraft meetings (La Ferté Allais & Le Bourget). He learned to fly before W.W.II, was involved in May-June 1940 in the French Air Force and, then, escaped in order to be able to join the Free French Army. He was trained in the U.S.A. on the P-47 but became an instructor when he wanted to fight. He stopped flying 2 years ago because of health problems.)

The second photo is coming from Aviation Magazine Nr. 55 (01-Aug-1952), page 23.

The photo included in the TWITT newsletter is interesting because it shows the aircraft with black (or dark) color line on the main body and, also, protection for the wheels.

I assume our French friends have some more extra pieces of information.

With best regards.

Eric du Trieu de Terdonck
Eric_du_Trieu_de_Terdonck@vesuvius.com



7/23/99

Thanks for your last e-mail. I just have some additional comments on the company which built this aircraft. The company S.E. was the old Lioré et Olivier company which was taken over by the French state between 1935 and 1939 (after the "Front populaire"). The name was changed to S.E. (Sud Est aviation) and now it is a part of the company Aérospatiale. This company built the huge seaplane S.E. 200 which was bombed on the Bodensee in 1944 and the famous jet passenger aircraft "Caravelle".

Did you received the advice for the Ho IV presentation at the Deutsche Museum on the 14-Aug-99 by Reinhold Stadler. If you didn't, I give you the e-mail he sent.

From: Reinhold_Stadler@mt.man.de

Hi friends,

I am back from holiday. Thanks for all the nice wishes to our new family-member. We really enjoy the new situation. I have now nearly no time to do anything during the day but lots of time at night...

But I was not really idle during these three weeks, you will see..... The Horten H IV W Nr. 26, which is being restored at the Deutsches Museum here will be finished in the next weeks. Before the airplane goes into the exhibition, it will be presented to the interested public on Saturday, August 14th. We start at 14:00 with three presentations: first a presentation on Horten design principles by me (sorry , but I am really the first to speak); then a presentation on the Horten airplanes by Edward Uden from the Horten-Archive and; followed by a presentation on the specific H IV, its history and restoration by Peter Hanickel (who rebuilt the center section)

After this is a chance to go to the restoration shop and see the airplane itself (aaaah, that's Horten-hardware!!) We have open end for all the discussions we want to do...

So, everybody interested is welcome! We have sent out invitations for the people around here, but you are never complete. So, even if you have not received anything, you are welcome!

From what I can tell, the museum people have done a rather good job with restoring the H IV. The rebuilt center

7/2/99

section is an accurate replica and Peter found a lot of details, which were forgotten during the years.

In the exhibition, the airplane will be hung from the roof. So, for everybody interested to see the interior, that's a definite chance now! And a chance to meet interesting people (e.g. Mr. Nickel wants to come and see the H IV again...)

Greetings,

Reinhold

(ed. - Thank you for all the information that wasn't included on the back of the postcard. I knew someone out there would come up with more information, as usual.

In have included the announcement on the Horten display, but it will be too late for most European members to see and still make the event. But it does keep everyone up to speed on how the restoration process is moving along. Russ Lee from the Air & Space Museum has told us about this project over time, but I don't think we realized one aircraft was so close to being finished.

If you or Reinhold have a chance to take any pictures, I would appreciate either or you e-mailing me several for the newsletter.)

7/18/99

TWITT:

I am an aeromodeller in Sydney, Australia (check our site at www.wrds.8m.com) and fly mainly scale. Having just completed a rather nice model of the Ford Flivver (well it came 2nd in our club contest last month) I am looking for information for a project (hmmm let's be a bit more realistic) a dream at present but it could become a project!

I found some drawings in the UK magazine, Aeromodeller for a Stabiloplan tailless aircraft designed and flown by Filip Mihail in Romania in the early 30's. The plan is for a small free flight model, I want to look at something around 72" span (approx 1/5) and radio controlled. Do you know of this plane? I particularly need things like airfoil sections, structural info and, of course, color scheme. If you can tell me anything or point me in the right direction I'd appreciate it.

Regards

Mike Minty
mikros@smartchat.net.au

PS I can now go back and study your site, it looks very interesting.

(ed. - If anyone has information on this aircraft, please let Mike know through his e-mail address and include us with a copy. If you don't have that capability just send the information to me at the post office box and I will make sure it gets to Mike.)

TWITT:

Nighthawk I (Phase I): Bird like lateral control and wings capable of twisting through +/- 25 deg under pilot command in flight; propulsion pusher prop (Soarmaster).

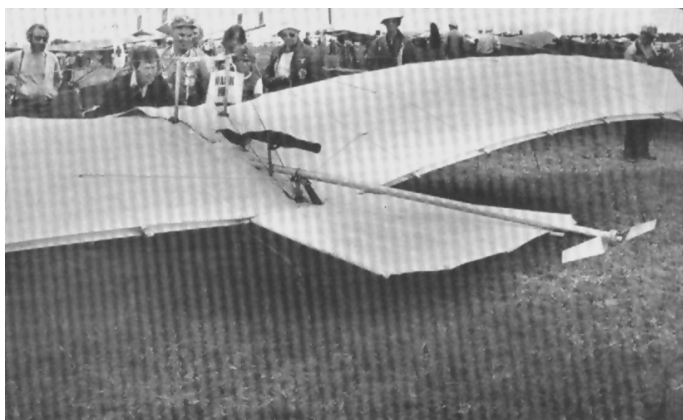
There are over one hundred pictures including details of assembly and various shots of aircraft structure. There is also much 8mm and about 10 minutes of 16mm film footage of the aircraft as it progressed from ground runs to *first flight* to a well behaved proto-bird. The 35mm prints and slides, and super 8mm were taken by my wife Linda, who also helped with testing, documentation and building. The photograph shows the Phase I Nighthawk project as we debugged the birdlike lateral control system during 1979.

Nighthawk II (Phase II): Replace the Pusher Prop with Flapping Wings; refine wing design to including sweep and span reduction during upstroke, and several other modifications including carbon spar...



ABOVE: Jim Theis in the flying position. (Source: Sport Aviation, October 1979.)

During the intervening 20 years, a foundation theory of flapping wing propulsion was developed and a research effort completed to develop a light, efficient, simple flapping wing drive concept. At least a dozen of the scores of concepts conceived to flap the 42 foot span wings of the Nighthawk II were reduced to numbers and drawings. Only one made it completely through the process successfully. Some of the concepts took a year to analyze in and around making a living as VP and chief design engineer of small turbines for Air Turbine Technology, Inc. (Company was sold in 1989 and my brother, Charley and I started up a wheelchair development company and moved our families from S. Florida to SE Minnesota).



ABOVE: This shows the propeller extension shaft and engine location. The tail section moves left and right in conjunction with the wing warping and, up and down for pitch control. The engine is an 8 hp Chrysler West Bend and the aircraft has been flown at Oshkosh. (Source: Sport Aviation, October 1979.)

Three years ago, July '96, we licensed our wheelchair technology and I became a full time flapping wing aircraft designer. Linda has sponsored the design effort (which is how my wife became my boss...). Like the Prop driven Nighthawk I, the Nighthawk II will be an ultralight (<254 lbs, stall, max speed within parameters of FAR part 103...), and I will once again become a test pilot.

As fate would have it, we are truly on a time line that parallels the Wright Brothers a hundred years displaced. I expect us to go through similar learning curve and through at least one complete design revision as we move forward to successful first flight with flapping wing propulsion (hopefully before Dec. 17, 2003).

Having read the same article in Sport Aviation as Jim Marske, I likewise planned to use Graphlite pultrusion carbon rods in the construction of various components. Jim is now a factory rep for AVIA SPORT's rod, which is superior to the Graphlite product. If you have Jim's e-mail address, please forward this note to him. He may be interested in helping with our project, or at least in being in the communications loop.

We have the domain name Orinithopter.com; my son Charlie is putting together the site. The whole story of this project will be accessible from there. We will build and test the Nighthawk II real time on the web, limited only by resources to present the material.

The work has been documented since its beginning in January of 1974 in twenty bound log books (National brand 5x5 quad) and seven bound sketch books (200 pages each). Since the days of Super-Calc (Osborn I and II >CPM) and more particularly Lotus, the analytical work is done using spreadsheets. There are many, many spreadsheets documenting the evolution of thought about the physics of flapping wings. The formal drawings are mostly AutoCad.dwg files, but I have recently transitioned to Bentley Systems 2/3D cad. Before I broke my back I used typical pen/ink drafting.

Since '89 we have had to work on a shoe string budget For several years my family lived in the shop while we built up the wheelchair technology to a marketable level. During that time I did a sole source turbo-alternator design for the Naval Weapons Power System group at China Lake, which was the source of about all the cash we had to live on till we licensed the wheelchair technology in '94. In '94 we had our first real theoretical break-through, then in November of '96 the "final?" and most important piece of the puzzle of flapping wing propulsion (to date) was discovered... by mid '97 we had the first spreadsheet that could produce a flap rate, using our flapping system and wings, about as low as a similar sized Great Blue Heron. Finally, this year, a solution was conceived to produce a drive to implement the flight mechanics dictated by the discoveries and confirmed by the spreadsheets; ...the drive is our "Wilbur Wright Bicycle Inner Tube Box... discovery" and as a result we can finally go forward with drive system hardware. We will begin building this year and testing this winter (there's only so much time we can spend making less than 150 lbs of parts... we have a sponsor that will manufacture one of the critical drive components to spec...).

For us, it is indeed true that The Wing is The Thing: for propulsion!

Our aim, Andy is to make a first step towards low power, highly maneuverable, flapping wing Local Flight..., Bird Like Flight.

Jim Theis
FLIGHTWING@worldnet.att.net

(ed. - Thanks for the very good description of your project and the picture that you sent in your original message.

I have supplemented it with several I scanned from Sport Aviation, October 1979, EAA, Inc., Hales Corner, WI, pp38-40.

I hope you will keep us up to date on the program as you progress through Phase II.)

7/15/99

TWITT:

Received the newsletter yesterday, very nice. Noticed the letter from Bob Hoey about his r/c birds. He is a fellow EAA Chap 49 member and recently gave his presentation on his birds to us, as well as bringing in his raven, seagull and turkey buzzard. His use of the tip feathers is very interesting and seems very effective on his birds.

Pleased to see the mention of the SHA events at Tehachapi this fall, as I'll be up there for the fun.

I'll see if I can locate Bernie Gross, would like to see his Pioneer.

Off on business and vacation for the next two weeks, will get to take in Oshkosh for one day while in Wisconsin for the Pietenpol gathering. I receive e-mail on the road, so you can still reach me.

Hope to see you in San Diego for the September meeting.

Mike List
michael.list@lmco.com

(ed. - The plan right now is for Bob Hoey to give one of his presentations at the November meeting. Boy is it nice to know that we have programs for the last two meetings this year.

I gave Mike Bernie's name and address since they both live in the Mojave desert and Mike would probably appreciate looking at Bernie's Pioneer II sailplane.

Our own Bob Chase will also be at Oshkosh this year and has taken some newsletters along for handout to those he finds who are flying wing buffs. We wish him luck in his quest for others who can join our group.)

7/12/99

TWITT:

During the past few months and following a weekend in Marion, Ohio with Jim Marske of Marske Flying Wings, I have put together a video of those two days discussing many of the discussion issues that this group has talked about. I would like to make this available to all. I sent a copy to Mr. Bowers and am including a portion of his response to me. I have also included a review by Serge Krauss, since he has also had a chance to see the video.

I would like to continue to produce more detail programs on other types of Flying Wings and other designers. I would very much like to hear from any of you about your ideas and thoughts.



ABOVE: Lloyd Watson's Pioneer repainted in Texas colors (you have to imagine them right now).

From Al Bowers

YES! I got the tape and watched it. The video is an excellent piece and should be sent in conjunction with Jim's book. The two compliment each other very well.

I can only encourage you to produce more of these videos. I agree with Mat Redsell, there is something to Jim Marske's ideas, but they don't seem to get the attention they deserve.

Again, I can only congratulate you on the excellent piece of work you've done for Jim Marske. It's an

excellent piece and should be very worthwhile for flying wing enthusiasts.

From Serge Krauss skrauss@earthlink.net

I was privileged to view part of the New Marske video at Marion last month and concur that it is a real gem - excellent. Lloyd has done fine work and a real service. Many thanks, Lloyd, for sending me a copy. I look forward to viewing it in its entirety when I return Sunday.

I hope Jim Marske will soon have time to complete a book on his Flying-wing researches and accomplishments to update his classic "Experiment in Flying-Wing Sailplanes". This could be one of the most important and useful books of all time on the subject of tailless flight; it would reflect a lifetime of acquired knowledge. I continue to offer encouragement in this area, but one cannot ask him to compromise progress on the Pioneer III, the first full-size tailless sailplane of its configuration to make use of current state-of-the-art in materials and aerodynamics. What I saw of it was quite beautiful and well wrought in detail. This exciting project is open-ended enough to allow development into both sport and competition planes. I hope Jim is able ultimately to write a technical history extending through development of the Pioneer III.

The Marske internet site continues to grow, with great construction photos (from Mike Hostage) and commentary, as well as many other features. The really fine work on this site by Mat Redsell mirrors his work with Marske in Marion. While I'm confident that most Nurflugel List members have visited this site, if you haven't recently, you're missing a good story unfolding. <http://continuo.com/videowebpage/index.htm>

Lloyd Watson
pilotltw@yahoo.com

(ed. - Lloyd also included a very nice press release for the video, but it was a little too long to get in this month because of the July meeting minutes. I will try to get it in next month so those of you who do not have internet access can see what it is all about and decide if you might want to purchase a copy. They sell for \$24.95 through the commercial enterprise that handles Marske products.

I have also included a nice shot of Lloyd's Pioneer II in this issue and will use it and others to update our website page on his project.)

1999 West Coast

**Sailplane Homebuilders Association Meeting
Jeff Byard Hanger - Mountain Valley Glider Port
Tehachapi, CA September 3-6, 1999**

Friday - September 3

6:30pm - Gary Osaba - Sigman Returns

7:30pm - Taras Kicenuik - Dynamic Soaring

Saturday - September 4

8:30am - Jay Morrison - Trike for Ultralight Sailplane

- 9:00am - Mike Sandlin - Bug 1 & 2 Ultralight Sailplanes
- 9:30am - Dan Armstrong - Windancer Progress
- 10:30am - Bruce Holz - Two Light Sailplane Designs
- 11:30am - George Appleby - Zia Self Launching Sailplane
- 1:30pm - Joe Alvarez - Hands on composite construction & tooling. Light, strong wing/tail elements

Sunday, September 5

- 8:30am - Mark West - Truck Mounted Ultralight Test Rig
- 9:30am - Paul MacCready - Soaring Addictions and Perspectives
- 10:30am - Danny Howell - Progress on Lighthawk
- 11:30am - Al Bowers - Horten Light Sailplane
- 1:30pm - Joe Alvarez - Hands on composite construction & tooling, Light, strong wing/tail elements
- 7:00pm - Banquet - Gary Osoba
When Slower is Faster, The Fun Factor Soars

Monday, Sept. 6 - 9:00am - Business Meeting

The annual SHA Workshop and Meeting over Labor Day Weekend is usually a great event as can be seen from the topics and speakers lined up for this year. It has been organized to leave the afternoon open so that those of you with sailplanes can also use the time to put in some good flights. Or you can attend the composite construction session that lasts throughout the afternoon period.

If you can't come for all the days, at least plan to come on the day with the speakers and topics that most interest you. For those of you who like to camp, there is a camp ground at the airport, or for the less hardy there are several motels in town.
