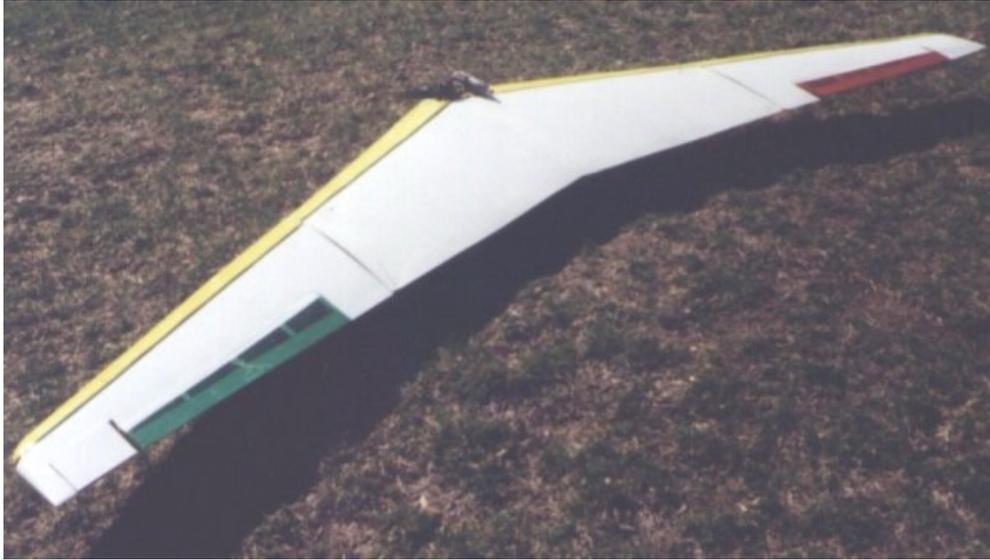


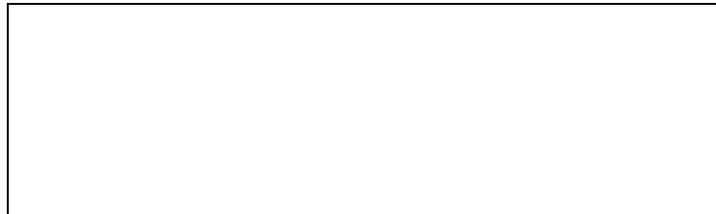
T.W.I.T.T. NEWSLETTER



Klingberg Wing x 2 : Built from Klingberg plans blown up twice. This is my most noticed plane. It has flown at two AMA open houses and in five states. OS 61 SF, mechanical retracts, five channels [elevons(2), throttle(1), retracts(1), nose steering(1), split-opening drag rudders(2)]. See Page 9 for more information on the Klingberg Wing.
Source: http://www.chrisgood.com/rcplanes/index.html#all_planes

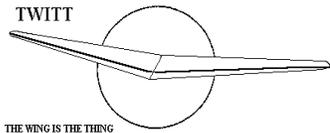
T.W.I.T.T.

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., 0410 means this is your last issue unless renewed.

Next TWITT meeting: Saturday, November 20, 2004, 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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- Secretary: Phillip Burgers** (619) 279-7901
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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

As you see from the program announcement, we won't be able to hear Dave Raspet's presentation until January 2005. The up side is that he may have some new material to show us on the work his father did involving the flight tests on the Horten IV. This will be an excellent way to get the 2005-year started.

In this issue I have included some of the material from the recent Sailplane Homebuilders Association Sailplane Builder magazine. The pieces I chose I thought were generic enough to be of interest to everyone and applicable to any type of aircraft building. They are sort of brief, since they were written in a recap form rather than try to be a thorough treatment of each subject. We are hoping that video and audio material will be available in the months ahead that will allow for more detailed transcriptions.

The last part of this issue includes pieces from the Nurflugel bulletin board list, and much of it has to do with the Klingberg wing kit. If any of you have experience with this design, either in the original or twisted versions, we would like to hear from you so other modelers in the group can learn. Perhaps someone else has a set of plans they would like to sell or give away so another member can use them to build the wing.

As I write this I am watching the documentary on Burt Rutan's SpaceShip One project to put a civilian into space and win the \$10 million prize if they can repeat it within the time limit. The craft is pretty much a flying wing that can be tilted up into a feathering position for the re-entry phase. So, when is one of our modeling members going to build a scale version and get it flying off a local slope, feather mechanism and all?



**NOVEMBER 20, 2004
PROGRAM**

There is good and bad news about upcoming programs. On the bad side, Dave Raspet had to cancel for November, but on the good side he has agreed to give his talk in January 2005. Apparently, the External Research Advisory Committee at Mississippi State University that Dave sits on decided to schedule their meeting for the same time as our meeting, and this is where Dave was supposed to get a hold of some new archival information we think he was going to share with us.

I am still working on some type of program for November so we close out the year on a positive note and everyone have a chance to get together once last time in 2004.

**SEPTEMBER 18, 2004
MEETING RECAP**

We did have a few people gather at the hanger for a short round of "hanger flying", a cold drink and a walk up and down the row looking into other hangers. Bob Chase gave us a recap of his first flight in his new motorglider that was shown on last month's cover. He was going to try and get us a written version before publication, but since it didn't arrive in time I will give you the highlights.

Bob took delivery of the Soaring Gull 2000 at Tehachapi over the Labor Day weekend. He had made arrangements to house the plane at Perris Valley Airport down in Riverside county and the only way to get it there was fly it. Since the manufacturer had already left, Bob had no choice but to make the ferry flight himself.

Bob had flown some dual at the manufacturers site so wasn't a complete stranger to the aircraft. He took off from Tehachapi, which is about 4,000 ASL, gained enough altitude while circling over the field to clear the mountains to the southeast, and headed out over the Mojave Desert for Cajon Pass. He was familiar with the route across the valley where he had to avoid the Edwards AFB restricted area, then past the famed El Mirage Dry Lake, and into the entrance to the pass.

Once in the pass he began letting down to an altitude that would allow for clearing the March AFB

control zone and make an approach to Perris Valley. As he got lower he started experiencing an increase in the cylinder head temperature at low power settings, so put off doing a couple of touch-n-goes at an auxiliary field used by ultralights for practice.

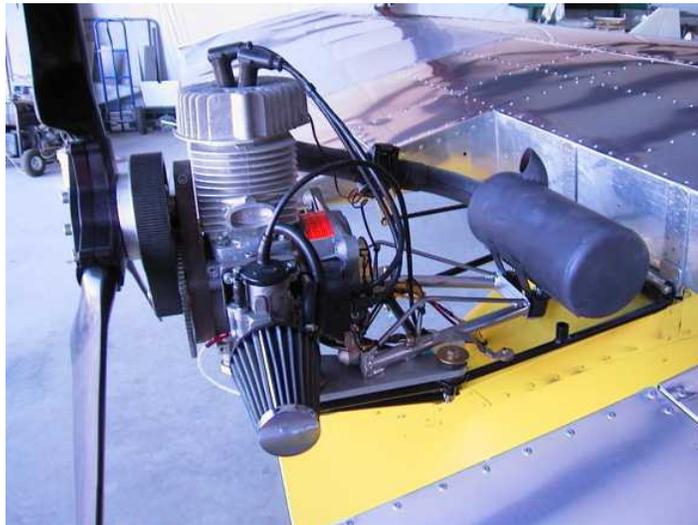


The landing at Perris Valley would be his first in his new airplane and it didn't go quite as well as he had planned. Even though he was using full flaps it floated way to far down the runway and he had to go around, all the time watching the higher than normal cylinder head temperature to make sure it didn't get out of control. The second try was more successful, but on rollout when he put on the wheel brakes one of the steel cables broke causing the plane to veer off the runway slightly. Fortunately, he was going pretty slow by that time so no harm was done.



After thinking about the overheating problem, it was determined that the jetting was out of sync with the mean altitude the plane would be flying. The manufacturer's shop was at about 2,000' where the

initial adjustments were made. He was now flying it at about 500' so the engine was getting too lean and thus heating up to the red line limit at the lower power settings when enough fuel wasn't acting as a coolant.



Regardless of the minor problems on his first flight, Bob is very satisfied with his new ride and will be getting use to it flying around the Perris Valley area for a while. Since this is a motorglider, he will be able to do a little soaring since there are some good lift areas within quick motoring distance of the airport.

I have included a couple more pictures I took of the Soaring Gull 2000 while it was in Les King's hanger at Tehachapi. I know it isn't a flying wing or other type of tailless aircraft, but it is what had gotten Bob back in the air again, and besides, no one had anything else to offer at the meeting.

(ed. – While I am thinking about it, don't forget that the hanger where we have the meeting has been designated as a historic museum area, therefore, if you have an antique airplane and are looking for tax exemption display opportunities, a TWITT meeting is one of them. So fly in for the next meeting and we will fill out your paperwork. Just ask the tower to direct you to the Skid Row hangers on the southeast side of the field.)



LETTERS TO THE EDITOR

September 9, 2004

Hello folks at TWITT,

Mitchell Wing

I am building a Mitchell wing B10 and wanted to make contact with the European builders. Would you have an email address or a postal address please?

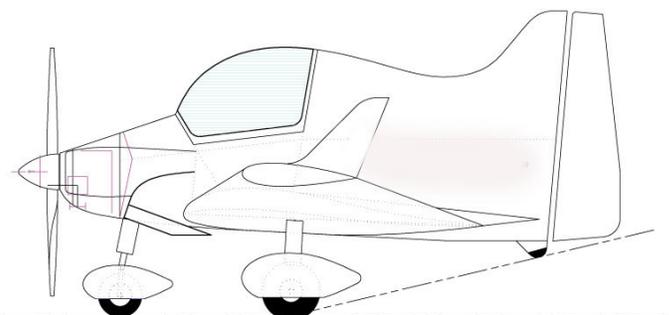
Thanks

Robin Germon
rjg@paradise.net.nz

(ed. – I put Rob in touch with Richard Avalon, who had completed a trip to Europe talking with Mitchell builders, although most had built the U-2 vs. the B-10. We got the following back from Rob.)

Thanks for the contact. I appreciate that. You may be interested that we are in the process of a complete re-draw and development of the Jacquemin Fauvel AV-60. The construction plans are being completely re-drawn on CAD and the whole aircraft is being updated to new material spec still an all-wood construction. A full review of the airframe weight is also in progress. The complete plans set will be available towards the end of this year. Should be a very nice stable and well-mannered aircraft. I also have the original 16 m.m. color footage of the prototype test flight way back in the 60's.

Rob



September 9, 2004

Plans For Al Backstrom's Plank?

I've been looking for some to use as a reference...does anyone have them?

Joe K. McKay
 Team Lead, Scout/Attack Flight Controls
 U.S. Army Aviation and Missile Command
 AMRDEC, AED, Aeromechanics Division
 (256) 705-9633
 joe.mckay@rdec.redstone.army.mil

(ed. – I sent Joe Al Backstrom's e-mail address to see if he could get what he needed directly from the designer and I haven't heard anything back to indicate the connection wasn't made. I find it interesting that something from a plank design is finding its way into a modern application.)

September 24, 2004

Hi Andy,

Morgan here, just wanted to drop a line and find out what I need to do to renew my membership with TWITT and SHA. Hope you are still involved with both. Been really busy here and if I don't ask about this I won't get around to it.

Missing the newsletters badly. Hope to start building a hanger soon and then to modify my Monerai for self-launch. Failing that, I can always build something. Want to do a flying wing. Did lots of testing PTLSD (prior to leaving San Diego).

I have a grass strip I carved out of a hillside and a ravine. Also have a shallow (60 foot drop) ridgeline that I could soar or launch from. Lots of work to do on this place and am working 60-80 hours a week on my new job. Say hi to June and the rest of the family (hope they remember me). I do miss the meetings at the hanger in El Cajon.

I don't miss the crazy traffic or the crowds. Rush hour here is when the cows line up at the milking parlor waiting to be juiced. Okay, the hurricane wasn't too cool but it took a turn five hours out and missed us by a hundred miles. Boarding up the house and taking down the antenna wasn't fun.... when I get the time I may put it back up and take the boards off the windows, but then, I'm not home much, out working at someone else's farm.

Have great beautiful peaceful smog free stars at night, green grass growin' cows and goats a munchin', chickens in the yard and deer in the field each wonderful day.

Morgan (can't stand country music) Detton
 kilolani1@netscape.net

(ed. – Morgan moved to Arkansas or Louisiana, can't remember which, some time ago, but it sounds like he has finally gotten settled in. The grass strip just outside the door with his own hanger sounds like a great combination.)

September 30, 2004

Andy:

Thought you would enjoy this. We are currently building a better, stronger version and I'll have pics for you in the near future.

Best,

Gary Fogel
 gfogel@natural-selection.com

+++++

FOR IMMEDIATE RELEASE

September 30, 2004

Futuristic Radio-Controlled Model Sailplane Headed to National Air and Space Museum's Steven F. Udvar-Hazy Center

San Diego, CA - A 1/5 scale model replica of a futuristic flying wing sailplane built and flown in 2001 by local modelers has been donated to the Smithsonian Institution's National Air and Space Museum for display at the new Steven F. Udvar-Hazy Center in Chantilly, VA. The "Altostratus I" was a conceptual sailplane design by Dr. John McMasters, a Technical Fellow of the Boeing Company and was the main character of an article in Soaring magazine in February, 1981. This fictional Altostratus I was equipped with many technological advancements including computer assisted pilot control. The original design for the Altostratus I flying wing had a 25 meter wingspan and an aspect ratio of 25:1.

In the year 2001, a team of radio-controlled model sailplane enthusiasts decided to recreate this fictional aircraft and demonstrate its true potential for

flight in the year it was originally intended to soar. The aircraft was constructed by Cirino A. Silva and Christopher Silva of Ontario, CA out of foam, fiberglass, and carbon fiber...materials that are common to the hobby industry. An off-the-shelf computer flight simulator was used to determine various expected flight parameters and to provide initial flight testing and evaluation of this unique design. The 5 meter (16.4 foot) wingspan radio-controlled flying wing was test flown July 6, 2001 by Dr. Gary B. Fogel of San Diego, CA at a location near Tehachapi, CA. The first soaring flight lasted roughly 20 minutes resulting in a successful landing. Subsequent tests with strengthened wings showed improved flight performance.



This project not only demonstrated the flying capability of the original Altostratus I design but illustrated the ease by which computer simulation and modern aircraft construction materials can be used by the average hobbyist to quickly prototype and evaluate novel aircraft designs without large expense or undue risk to test pilots. Christopher Silva is currently a Mechanical Engineer for the Lawrence Livermore National Laboratories in Livermore, CA and Dr. Gary B. Fogel is currently Vice President of Natural Selection, Inc. in La Jolla, CA.

For additional information on this aircraft please contact:

Dr. Gary B. Fogel at (858) 455-6449
or visit www.geocities.com/altostratussailplane

(ed. – By the time we published, Gary hadn't had a chance to get any pictures of the new model to us, but I did take a couple of shots off their website of the original one with a new paint job. It is white with a blue stripe down the middle of the wing. I also included one of the original pictures showing the launch as a comparison.)



September 20, 2004

TWITT:

I keep reading and admiring the effort involved in publishing the TWITT Newsletter. Please accept my subscription for another year.

Keith Hauke
Maine City, MI

(ed. – Thank you for the nice comment on the newsletter and your confidence in TWITT by renewing for another year. We seem to now have a core group of about 95 flying wing enthusiasts, with the prospect of a few new members coming onboard from some foreign locations.

If there are things you would like to see in the newsletter, please let me know and I will try to find out more information and include it. If you have something to pass along, please make sure to e-mail or snail mail it to me so I can share it with the rest of the members.)

September 13, 2004

TWITT:

Please find my check to cover the Kasper bibliography package.

You think this flying saucer may be something; you should see the drawing of the power plant. I have all (most all) the information on it. I don't know, would you class this a flying wing?

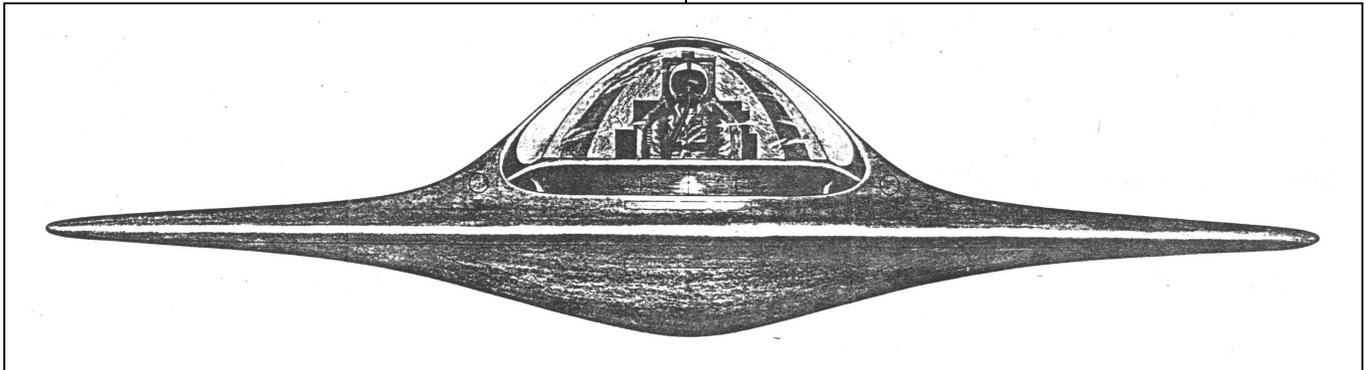
John D. Patten
Jackson, LA

(ed. – Thanks for sending along the illustration. From this view it would appear to be a flying wing with a look similar to that of the PUL-10 from the front. I imagine the top view would be a lot different if it is truly shaped like a saucer.

I wasn't aware that we had the technology to even conceive of who to construct a power plant for such a craft, so it would be interesting to see the basic drawings of it just to determine how far out we might be from actually achieving this type of flight.)

result is dramatically decreased mission time to the outer planets. A very sharp leading edge is required so new improved materials will be required. Once again, AI who helps out in so many ways has opened up our thinking. Similarities of this scheme with some aspects of our search for dynamic soaring were noted by Osoba and Kiceniuk.

The technique is called Aero Gravity Assist (AGA) and involves the use of spacecraft similar in appear to the waverider (Hyper-X) demonstrator



2004 SHA WESTERN WORKSHOP HIGHLIGHTS

(ed. – The majority of the information below was provided by Bruce Carmichael in a recap of the workshop sessions from the Labor day event. I have added a few comments here and there based on what I observed/heard from the speakers, and included some of the pictures I took during the event.)

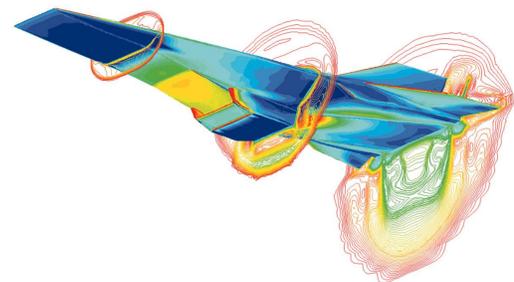
AL BOWERS- Al is chief of aerodynamics at the NASA Dryden Flight Research Lab at Edwards. He gave a beautifully illustrated talk on a plan for space travel that entails circling the inner high speed planets with lift directed inward which results in gaining very large increases in



velocity. Shock induced positive pressure on the vehicle underside plus pulling 4 G's is involved. The

launched earlier this year in a NASA test flight over the Mojave Desert. It only reached about Mach 7, but when the technique is used in a planetary mode, the speeds will be approaching Mach 43 once leaving the last slingshot plant.

The technique uses the atmosphere to increase bending angle and delta V resulting in high interplanetary velocities and shorter mission durations to distant targets. An example would be a round trip mission to our Sun using Venus and Mars AGAs. A launch would occur in June 2007, do an AGA around Venus in August 2007, an AGA around Mars in November 2007, and reach the Sun in April 2008. That's 92 million miles (direct) in less than a year, but really covering a lot more distance to enable the AGA maneuvers around the inner planets. (ed. - If you are into dynamic soaring start perfecting your techniques so you can pilot one of these missions.)



ABOVE: Computational fluid dynamic image of the Hyer-X vehicle at Mach 7 with the engine running. Tailless vehicles could be space's future.

MIKE ALLEN - Al Bowers had clued us on to Mike Allen (below) who also works at NASA Dryden. This young man also worked at Dryden between college semesters before joining full time. Mike is doing analytical studies on the problem of extending autonomous vehicle duration through use of atmospheric convection. He has a great deal more measured data on thermal size, height, strength and duration than this writer had for his 1954 study on optimizing sailplane design. Mike's most recent data comes from a western desert site and probably represents maximum conditions but he also has data from other studies. Gary Osoba was able to refer him to additional sources. The result of his matching the performance of a modest size electric prop driven RPV to his atmosphere is a 2 to 10 increase in duration. Once again SHA workshop appears at the cutting edge of soaring technology.



LES KING – Les described latest changes in his low cost glider trainer. He displayed a leading edge sample with thin plywood skin butted to a leading edge plastic nose cap over foam ribs.

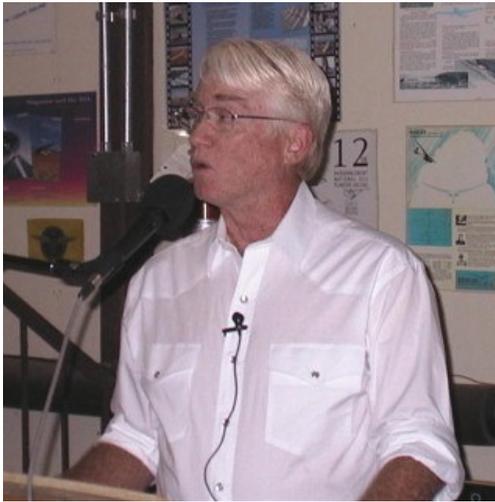


He discussed the pros and cons of various sandwich core materials. The 1#/cu.ft. Styrofoam is too compressible. The blue 2#/cu.ft. foam is much better. Water base epoxy is compatible with styrene foam. He also showed the plug made from the light white foam and the fiberglass nose he pulled from it for his training glider.



LOWER LEFT: A plastic nose cone that was shaped over simple foam. You do need a releasing agent between the foam and glass, or you can use something like Saran Wrap, since you really don't care what the inside looks like. **ABOVE:** These are examples of plastic formed ribs, with the center being a set glued together at a angle. The set at the upper left corner of the picture is the leading edge sample with the ribs in a more normal configuration.

BILL LISCOMB – The banquet speaker, gave a remarkable illustrated history of the hang glider movement pointing out the contributions of Rogallo, Miller, Dickinson, Bennet and many others. Scenes from the first Lilienthal Meet were met with many chuckles from the audience. His tale of Joe Faust dealing with the police is a classic. Our own Irv Culver had once remarked that Joe Faust was so far out there he couldn't get back. Shots of Taras Kiceniuk transferring from the Batso to a soaring foot launch sailplane in one year caught the respect of the crowd. For those of us around from the start this presentation was outstanding. So good to see the many personalities of those days. What a magnificent ending to a superlative workshop. *(ed. – This is for those of you who are into hang gliding and ultralights, since many of the early craft were tailless wings, as are some of the current higher performance gliders.)*



ABOVE: Bill Liscomb during his presentation on Rogallo wings.

2004 SHA EASTERN WORKSHOP HIGHLIGHTS

(ed. – These highlights were prepared by David Hudnut with pictures by Al McCarty.)

We started the program at the picnic table with an informal discussion by Steve of shaping small parts with a router and the very handy Formica trimmer. From this, he went on into some detail on the layering of carbon rods and graphite tow in the modified spars of his Magic Dragon, and he repeated his mantra/ caution: there's no substitute for a load test when dealing with composite structures.



ABOVE: Steve, Leo, Jerry and Dave at the table looking at the test piece Steve covered in this discussion group.

Oleg Golovidov showed up as a workshop attendee, very much interested in Steve's (Arndt) Magic Dragon; this year he came back with a detailed analysis of a powered version, much modified, which he intends to build. In his study, Oleg has looked at a range of potential engines, starting with some rather pricey giant model power plants now used in large scale model airplanes and ranging up into engines for small airplanes and powered parachutes.

He's looking for 14-18 hp with a reduction system, or 20-25 hp direct drive, and his favorite at the moment is the Radne Raket 120ES-RD, which goes for about \$950. The engine will not be retractable, so he'll use a folding prop, which must be designed.

He'll be extending the span, area, and max Cl of the wing to overcome the additional drag of the engine and prop, and Mark Drela is providing new airfoils for the wing, which is multi-tapered. He projects a span of 14 meters, with a wing area of about 15 square meters and an empty weight of 110 kg. The hoped-for L/D is 24 or 25:1 at 35-40 mph and the minimum sink, 120 fpm.

We packed a lot of program into Saturday afternoon and evening, beginning with Steve's (Arndt) demo of his clever cam-lock rib building jig, which enables the builder to build several of the ribs in a tapered wing (as in the Carbon Dragon) from the usual single-sheet plan without moving the (offset) pivoting pins of the plywood circles (which hold the cap strips against the diagonals in each rib) every time he moves to a new rib on the drawing (below). Steve repeated his tried and true basic advice: build something every day, and set up three or four areas of construction in your shop in order to be able to shift to something else while the last thing dries or cures.



Tom Blevins (below) is a professional boat builder from Maine, and he knows a thing or two about glass composite fabrication. He began his presentation on vacuum bagging with a discussion of types of fabric available and the characteristics of various epoxies, and then we adjourned to the picnic area for a table-top demo of vacuum bagging with the very serious vacuum pump (on the table below) he uses (not your mother's old Bissell) in boat building, complete with system for extracting excess epoxy mixture from the air that is withdrawn from the bagged space as the vacuum is created. The rationale for bagging, as Tom points out, is to achieve the optimum saturation of the cloth in the lamination, without over wetting.



For a bleeder cloth (which goes over the wetted laminations for the part and any peel ply) Tom uses ordinary fiberglass insect screen. The excess epoxy bleeds out under the pressure of the bag, once the pump begins to exhaust the air and the weight of the atmosphere begins to clamp down, and is channeled back to the overflow container via the cavity created by inserting coiled plastic wire wrap in the bag leading away from the part being squeezed. Vacuum bagging is "clean and healthy," says Tom: but he ends up with spatters of epoxy on his Dockers, so I'm a little skeptical. It's clean and healthy if you're extremely careful, as he would suggest.

NURFLUGEL BULLETIN BOARD ITEMS

September 7, 2004

Subject: PUL-10, Horten, Nickel

I am conducting research on wing morphing for the control of swept wing tailless aircraft. A starting point in my research is the PUL-10. I am setting this aircraft as a state of the art tailless aircraft. I am using the PUL-10's aerodynamics and controls as a comparison point and then using the PUL-10's aerodynamics along with wing morphing and comparing it back to the original aircraft. The comparison will be done using theory, wind tunnel testing and an 8 ft UAV flight demonstrator. There are three pieces of information I am trying to find and I think this group is best possible source.

- 1) Accurate geometry information on the PUL-10's aerodynamics and controls. (Currently I am using photographs and the info. on nurflugel.com)
- 2) A source to get Reimar Hortens PhD dissertation
- 3) A source to get Karl Nickels PhD dissertation

Thank you for your help.

Richard Guiler
 Aerospace Research Engineer
 West Virginia University
 rguiler@mix.wvu.edu

<http://w3.gwis.com/~mks/book.htm>
http://yarchive.net/mil/flying_wing.html
 and definitely e-mail Al Bowers with your questions. He is a gentleman and a very helpful one. This is his e-mail: bowers@orville.dfrc.nasa.gov

Cordially

Bruno

September 7, 2004

Hi All!

I have found a Klingberg wing among my model kits and am wondering if anyone on the list would be interested in purchasing it. I don't have any idea what it is worth and I don't want to bother with e-bay. So I am open to offers.

Klingberg wing is a 78" built up balsa & ply swept planform flying wing. Planform is same as Northrop.

Area 650 sq Inches. Weight 25 to 30 oz. 2ch R/C glider. Has D-tube leading edge with Monokote cover from D-tube to trailing edge. Kit has been out of production for quite a long time. Materials for power pod are included, as are jig for building the twist into the wing. You can contact me at opie38@juno.com

Jerry Nolan

September 7, 2004

Mike Allen did a Horten twist on a Klingberg some years ago. The web site is still up at:

<http://pr.erau.edu/~allenm/wing.html>

Best regards,

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

There are some pictures of Klingbergs on Chris Good's RC Page:

http://www.chrisgood.com/rcplanes/index.html#all_planes

Norman Masters
<nmasters@acsol.net>

Doug Holverson wrote:

This guy has some pretty amazing stuff!

What do you think about the UAV or the double sized Klingberg? The 2x Klingberg uses a tractor propeller, although Mr. Klingberg recommends against it.

Norm Masters wrote:

If you read the pages, Doug, you know as much as I do about the scaled up Klingberg. I've been keeping an eye on this site for several years hoping that he would write some more about the UAV but there hasn't been much added since before he got his master's degree. I guess the details were just between him and his professors. A flight report would have been nice though.

As for the tractor prop question: I think that the efficiency argument wins IF the moment arm is short and/or the power low but the stability argument wins if the arm is long and/or the power high. What I mean by that is that as long as the prop is fairly close to the

CG its affect on stability is pretty small (just like a fin) but if you're using a long extension shaft, or a lot of power, then the prop could have a significant affect on stability and therefore should be in back. Mr. Good says the 2x Klingberg performed well so I assume the negative control moments from the prop were tolerable.

September 7, 2004

Subject: Robbe VAMPIR

Hello Group:

Has anybody had first hand experience of the Robbe Vampir r/c flying wing, I've come across one for sale and would like to know if it's a potential dog or not.

Also anything to look out for as far as construction goes? Those canted down tips look a bit vulnerable to landing damage to me...

Any info would be much appreciated, thanks in Advance.

P. Westrup
<p_westrup@hotmail.com>

Apparently you guessed correctly: definitely a member of the unhandleable species. I would not touch it. It has been discontinued as a production kit and reports are as it is better to look for something... flying, instead.

Cheers

Bruno

**AVAILABLE PLANS &
REFERENCE MATERIAL**

**Coming Soon: Tailless Aircraft Bibliography
Edition 1-g**

Edition 1-f, which is sold out, contained over 5600 annotated tailless aircraft and related listings: reports, papers, books, articles, patents, etc. of 1867 - present, listed chronologically and supported by introductory material, 3 Appendices, and other helpful information. Historical overview. Information on sources, location and acquisition of material. Alphabetical listing of 370 creators of tailless and related aircraft, including dates and configurations. More. Only a limited number printed. Not cross referenced: 342 pages. It was spiral bound in plain black vinyl. By far the largest ever of its kind - a unique source of hardcore information.

But don't despair, Edition 1-g is in the works and will be bigger and better than ever. It will also include a very extensive listing of the relevant U.S. patents, which may be the most comprehensive one ever put together. A publication date has not been set yet, so check back here once in a while.

Prices: To Be Announced

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