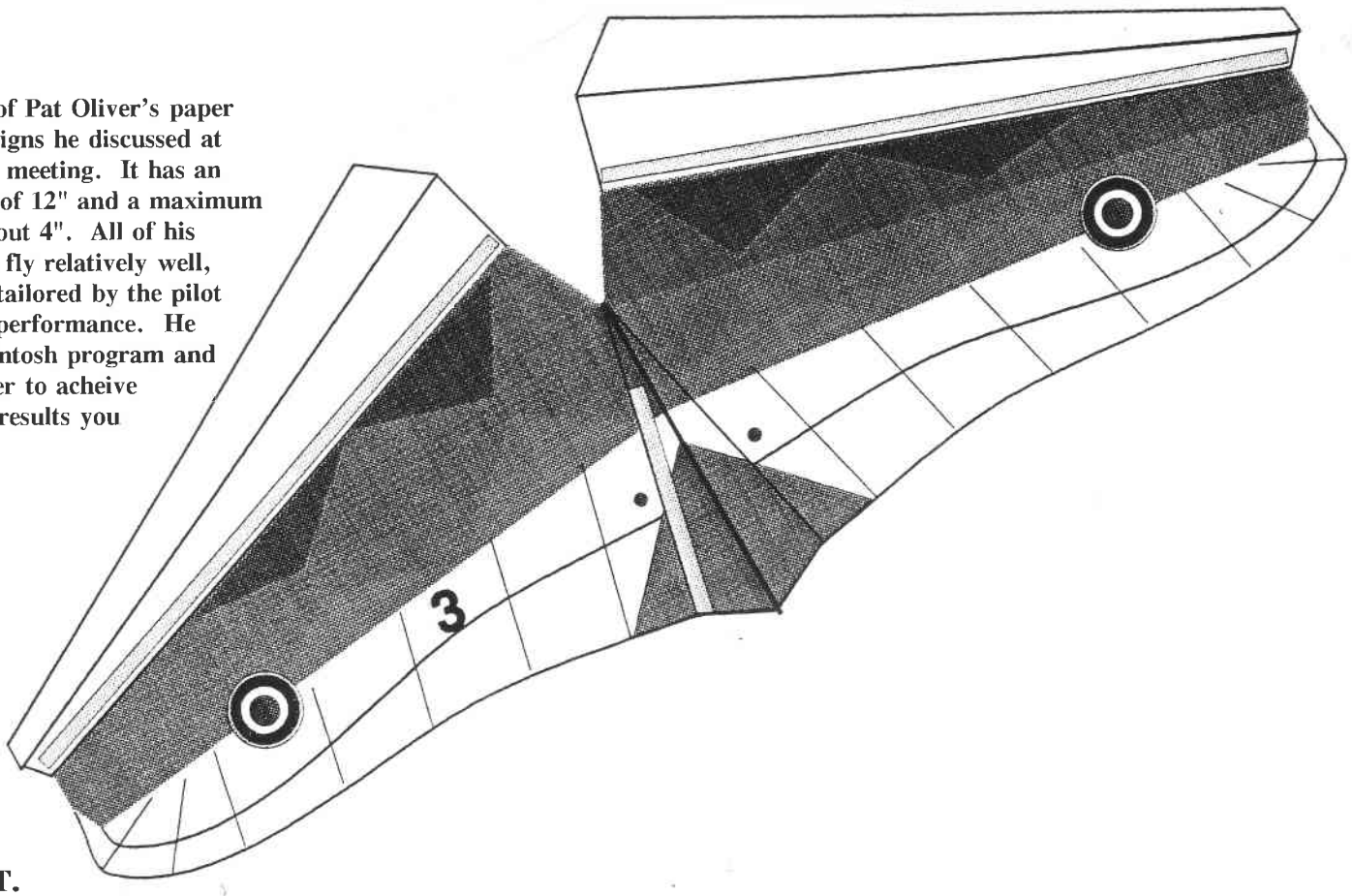
No. 104 FEBRUARY 1995

T.W.I.T.T. NEWSLETTER

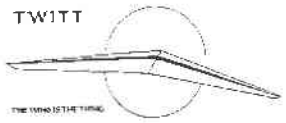


This is one of Pat Oliver's paper airplane designs he discussed at the January meeting. It has an actual span of 12" and a maximum chord of about 4". All of his model types fly relatively well, and can be tailored by the pilot to improve performance. He uses a MacIntosh program and inkjet printer to acheive the printed results you see here.

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., **9502** means this is your last issue unless renewed.

Next TWITT meeting: Saturday, March 18, 1995, 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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El Cajon, CA 92021

(619) 596-2518 (10am-5:30pm, PST)
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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

Well, surfing the Internet is obviously not as simple as I thought. If some of you have been trying to use the address I put in last month's newsletter, you probably have found it doesn't work quite right. I left out my Prodigy suffix letter, so the right address is: **NBKP63A@prodigy.com**. I know this one works, since I have received at least one Internet message so far.

In order to step into the "Internet Age" I had to upgrade my computer system, so now I have lots of disk space (420mb), extra RAM (4mb), and a higher speed processor (66hz), and will be gradually switching over to a Windows environment as time goes by. It is already making the manipulation of the newsletter production go much easier (wish I had done it months ago).

As of publication date we hadn't received any feedback on Barney Vincellette's proposed design. Either he is right on track and no one has any comments one way or the other, or you all are just as busy as the rest of us and can't get you ideas down on paper. (Hey, Internet them.)

That brings up one last point on the Internet. From what I can determine, I have the capability to accept graphics files, so if you have something already drawn in the computer and the capability to download it into your messaging program, you can send it along with the text. **However**, if it is an extremely large file (over 50,000 bytes) please send it surface mail since it could start driving my monthly bill higher than I want for the time being.

Just a reminder about renewals. The number in the upper right corner of your mailing label shows the year and month (e.g., 9502) your subscription runs out. If you are due it is usually circled in red as an additional visual aid. We do give you a little grace period, but it would help with bookkeeping if they came in when due. Thanks for your consideration with this.

Andy

MARCH 18, 1995 PROGRAM

The tentative program for next month will be **Brian Evans** who will be talking to us about composites and the repairing of older sailplanes. This should be an interesting topic since everyone has to repair their airplane at one time or another.

MINUTES OF THE JANUARY 21, 1995 MEETING

Andy opened the meeting in a more informal format for the day since there was a small audience.

He then announced that Budd Love's wife had passed away on Monday and there was a memorial service today in La Jolla. TWITT did send flowers to the service along with our condolences.

Andy thanked Chris and Connie Tuffli for the two packages of cookies for our enjoyment.

He then apologized for the leaving the "A" suffix off his Internet address, and that he would be correcting it in the next newsletter. One of the ideas for using the Internet was to make it easier for all members, especially foreign ones, to communicate with us in a more convenient manner. Hopefully our European members would find it more cost effective to send an electronic message versus putting money into postage.

Chris was then asked to tell us what he knew about the recent crash of a Bede 10 jet sport plane. He commented that it occurred at an aircraft plant in Nevada on the fourth flight of the day. The #2 aircraft had about 29 hours on it and for some unknown reason it came apart in the air killing the pilot. The plant is apparently constructing about 10 aircraft, but then was to begin preparing kits rather than finished planes. This program may now be on hold, but more will probably be published on it by the trade magazines in the months ahead.

Andy showed some video footage from the 1993 SHA Western Workshop which included Brian Robbins and Eric Beckman walking around the SWIFT. This was only part of the material available on VHS that was prepared by Randy Bergum, one of our TWITT members.

Bruce Carmichael introduced his guest, Howie Burr, who is one of the people instrumental in putting on the annual SHA Western Workshop. They had just left an initial meeting of the Ultralight Soaring Association, and it appeared it was off to a promising start. I am sure we will be hearing more from this group in the future since they have an interest in tailless, self-launch aircraft.

Andy then introduced Pat Oliver, our main speaker for the day, who would be telling us about his current project of designing paper flying wings and a student training program.

Pat began by telling the group about how he got into making paper airplanes while a sixth grade student in a Catholic school. Rather than rap him on the wrist with a ruler, the instructor made him build 100 paper airplanes (they were delta wings), throw them out a window, and then go out and pick them all up.

Last year, after acquiring a MacIntosh computer to help with his current studies leading to a degree in biology and a teaching certificate, he got started designing paper airplanes again *(ed. - apparently he is like most students who would rather do most anything besides study).* This got him to thinking about using this as a means of teaching kids about the scientific method while having some fun at the same time. They would also be learning about various flight characteristics using different styles of aircraft.

The program would be designed to lead them through a series of designs, conducting a complete set of controlled experiments that would help them answer questions about flight, mathematics and scientific testing methods.

One series of wing designs would explore the affects of sweep on performance. They would use paper airplanes with the same basic wing area but with differing amounts of sweep and put them through controlled glide tests. The observations would be recorded and the results analyzed. This later part would be aided by a list of definitions of aeronautical terms that have been put into a less technical format. *(ed. - the terms he uses are shown on pages 3 & 4, but remember these are being geared for 4th through 9th graders so may not be exactly to you "technocrats" specifications.)*

(ed. - The following is taken from Pat's introduction paper and probably puts it better than I could do by trying to translate the meeting tape.)

Introduction and Philosophy:

There are many challenges that the next generation face in the technological world that has evolved in the last two centuries. Mathematics and scientific method and the ability to communicate about the nature of the universe around us revealed by these arts have played a major part in its development. The early exposure of students to the basic practices of science will benefit them scholastically in terms of observational skills, organization and critical evaluation of ideas. The hands on approach allows an interactive environment in which the student can observe real time phenomena, with some basic aerodynamic principles, guided by their teacher, think about, hypothesize, investigate and test their ideas. Hopefully, given this experience, the student can apply these skills to their own particular areas of interest. Remember, thinking, exploring and learning can be fun!

Learning Guide

Basic aerodynamics associated with FLYING WING paper aircraft.

Some essential terms:

Lift- Upward force generated by an airfoil as air moves around it (opposes gravity).

Drag- Force of resistance to forward motion of a body as it moves through the air (opposes thrust).

Weight- Downward force that opposes LIFT. (is a function of gravity.)

Thrust- Force that drives an airplane forward through the air. (opposes drag.), Powered airplanes use motors, gliders use gravity.

Air - A mixture of gasses that make up the atmosphere, We breath air, Planes use air to generate lift.

Bernoulli's Principle - Air moving over a curved surface accelerates (speeds up), generating lower dynamic pressure .

Dynamic pressure - Pressure generated by air as it acts upon an object such as an airfoil. Lift is a force caused by dynamic pressure. Feel the wind in your face when you ride your bicycle, that's dynamic pressure!

Airfoil - An object shaped to allow for smooth airflow as it moves through the air. A wing is an airfoil.

Angle of Attack- Angle that the airfoil encounters the air stream. As the angle of the airfoil increases, lift increases until the smooth airflow breaks up and the wing stalls.

Stall- Is what happens when the Angle of Attack increases to the point that smooth airflow is disrupted , drag increases and the airfoil stops generating lift.

Stability- The characteristic of an aircraft to resist changes of direction in the axis of flight.

Axis of Flight- *longitudinal* - pitch, up and down (nod head" yes")
yaw - turn (left and right, shake head "no").
roll - bank, Down and up to the (leftor right).

Balance Point (center of gravity) - Point that is slightly forward of the center of lift, where the glider balances in a level attitude.

Dynamic balance(Trim) - Condition under which the glider or airplane is in stable level flight. That is when: (Lift = weight and Thrust= Drag.)

Span - Length of wing from left tip to right tip.

Cord - Width of a wing from front to back.

Area - Calculation of the area contained within the outline of the wing or lifting surface.
eg. (rectangular wing) Span x Cord = Wing Area

Aspect Ratio - Relationship between Wing Span to Wing Cord (rectangular wings), Wing Span to Area (Swept wings).

Lift to Drag Ratio - Numerical relationship between the horizontal distance traveled (lift) compared to the vertical distance traveled (drag).

Area Loading- Is the weight of the aircraft divided by the area of the aircraft:

$$\frac{\text{Weight in grams}}{(\text{Area units})^2} = \text{Area Loading (wing loading)}$$

Stabilizing Factors:

Sweep -When veiwing the wing from above, the ange that is described by the leading edge of the wing.
eg.: strait wing = 90^o, back sweep is less than 90^o, forward sweep is greater than 90^o.

Twist (washout) - Is the diffreence(in degrees) between the angle of attack of the root of the wing and the angle of attack of the tip of the wing. eg. (If the root of the wing is level then the tip of the wing will angle up from front to back.) (**Avoid Wash in !)**

Dihedral- (Two angles) When veiwed from the front or rear, the center of the wings bend up to form a shallow V.

Polyhedral-(many angles) More tha one dihedral angle. (See dihedral.)

Anhedral- Central angle of wing angles down. (See dihedral.)

Gull-wing- Wing form that has dihedral at the center and an anhedral angle between the root and the tip. (Looks like a sea gull wing.)

Reflex- The part at the rear of an airfoil that bends up. (see Airfoil) Acts in resisting a pitching down of an airfoil or wing as it speeds up and also assistes in a stall recovery.

Elevator Tab- Control surface on the trailing edgeof the wing or tail used for pitch adjustments. (See Axis of Flight.)

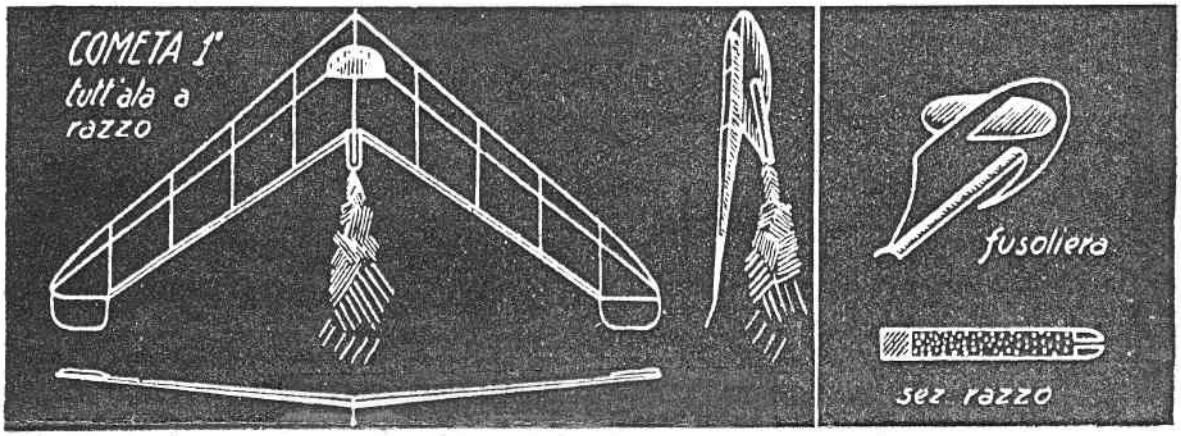
Rudder Tab- Control surface at trailing edge of rudder used for turn adjustments. (See Axis of Flight.)

Aileron Tab- Control surface on trailing edge of wings used for roll and turn adjustments. (See Axis of Flight.)

Elevon Tab- Control surface on trailing edge of Flying wing used for adjustments inall three axis: pitch, yaw and roll. (See Axis of Flight.)

BELOW: Sketch of a 1943 rocket powered tailless model. See Ferdi Gale's letter for more.

Esperienze sul Cometa 1ª



Objectives:

To stimulate through play, discussion and experimentation, the principles of scientific inquiry involving as a medium, basic paper airplane aerodynamics.

To introduce and apply the concepts of systematic inquiry through "scientific method".

Focusing on: observation; hypotheses formation; experimental design; data gathering; simple statistical analysis; graphical representation; data interpretation (trends and inferences); and peer review.

To reinforce basic mathematical skills appropriate to the age level and activity.

To gain confidence by writing and orally communicating the results of their research.

To foster healthy competition in both individual and team learning in a cooperative spirit.

To generate an interest in science and aerospace subjects.

To have fun in the process!

Pat has designed a program outline to help lead the teacher and student through a test program. As each variable is tested for, a data sheet is filled out with the results of flight. The airplane is flown through at least 10 repetitions of a particular variable, such as, L/D, total distance, etc., and the work for all students is later combined to improve the overall results evaluation. Here is where they get both individual and team work exposure.

The question was asked on how a teacher who is not familiar with aerodynamics can teach the students these theories. Pat commented that he would be writing a teacher's manual with enough information provided the teacher to enable them to learn along with the students using typical scientific methods of test evaluation. It will be a real hands-on method of teaching, which some teachers really like since it makes subjects much more interesting for the students.

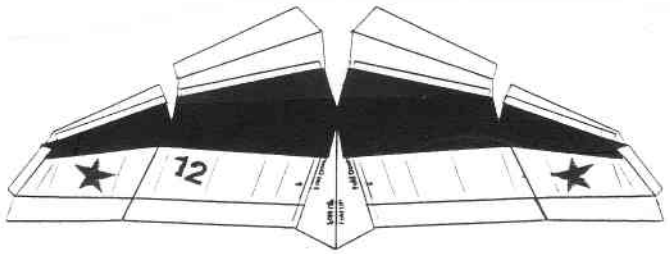
The hope would be that the students get so involved in the project they would branch out on their own looking for more information and finding new things to test for. In some instances it might be expected that the students would eventually surpass the teacher in conducting testing and evaluating results.

Along with making this a learning experience for our youth, he is also planning on finding a way to market his designs through a commercial source. *(ed. - this would be great for the flying wing movement, since Pat uses this form because it is easier to layout and build than a tailed aircraft, and creates more parameters for testing theories.)* He has several that are replicas of know aircraft like the Northrop N-9M, F-117, B-2, and the Zimmerman Flying Pancake.

There will be some operational warnings to go along with each aircraft, like to not fly in the shower. It is up to the owner to determine why there is such a restriction (improving the learning curve and all that). Performance won't be guaranteed in small closets.

One other goal Pat may start to shoot for is breaking the world record for paper airplanes. It is now about 18.8 secs. (yes, seconds) from a ground launched throw and then free flighting to the floor. These are usually done in big indoor arenas or blimp hangers, with the only restrictions being it has to be made of paper. Ed Lockhart asked if there was any known weight limit, since this could play a part in whether or not you could get enough altitude with a large enough plane to achieve the flight goal. Pat knew of no weight limits and he was going to get together with Ed later to talk about some theories.

Pat continued the program by doing some demonstration flights of the various versions he had on the table. Each has its own unique flying qualities, and several members were caught off guard as a flight ended in the middle of their foreheads or in their ear.



ABOVE: One of Pat's own designs. The upper lined areas are folded under the wing to form a rigid leading edge. The outer tips are then given some anhedral.

Bob Chase asked what type of adhesive Pat used to hold the numerous folds that provide rigidity in place. He favorite is double sided sail tape which comes in a narrow roll and is relatively strong. He also uses a 50/50 mix of water and standard white glue, but you can also use the CA types for quicker building. Each person sort of finds what works best for him.

Pat used masking tape to form the ballast on the nose, and it has the side benefit of providing some additional stiffness. It is available from most sail shops (if you live in an area with lots of boats), but other types of double sided tape might also work well. For some of the bigger ones he uses lead solder in the leading edge and then tapes over it. As he noted in his opening remarks, the idea is to experiment and find out what does and does not work, since that's part of the fun of it.

There was some general discussion about different methods for conducting tests of flight characteristics. The biggest problem is achieving consistency in the launch process for each plane has the same amount of momentum going into the test run. One method was actually tried by Stephan Viellard where he used a falling baseball on a string to provide the forward motion from a flat launching

surface (dining room table). Bruce Carmichael described a very complex one using motion picture cameras, rotating disks, and an aircraft with lights flying in a dark room.

The ultimate goal is to get elementary school students involved in science, using standard methods that can be carried into other fields, like biology. It will help them build math, written and oral communications, etc. skills they can apply to any phase of their lives. Pat offered to publish a small newsletter to keep people informed about his progress if they were interested. *(ed. - If there is anyone else out there that would like to pursue this in their local area, please drop us a line and we will put you in touch with Pat.)*

At that point the group thanked Pat for his dedication to the project, and then broke into small pods of aircraft experimenters, taking many of Pat's demonstration models into other parts of hanger and trying to make them fly better. If you should get a chance to visit the hanger in the near future you might just find some of them in the nooks and crannies of the historical memorabilia scattered all around.

LETTERS TO THE EDITOR

1/30/95

Hi,

Its great that you've got an E-mail address. You might want to think about setting up a List Server somewhere. It appears from your Internet address that you are using Prodigy. My guess is that you couldn't do that there, but maybe someone else could do it for you. If I ever figure out how to do it (ie. can find the time) I might volunteer.

I do want to thank you for the information you sent me about Jerry Blumenthal's Rattler. I haven't built one yet but I am still seriously planning to. I have been in contact with Jim Ealy (JIMEALY@peddie.k12.nj.us) who was the one who was drawing up the Rattler plans for Jerry. He hadn't progressed very far and is a very busy person. I think I may have to do my own designing.

My hope is to produce a competition level R/C thermal glider of the open class (120" wing span) size. I'm looking at all the airfoils I can (and learning a lot of things I'm not sure I want to know). Jim has been suggesting the Monarch airfoils and I'm also looking at some that Michael Selig designed for flying wings (Soar Tech 7?). I might make a small (60") prototype hand launch model to try out things before I build the open class plane. I may also ask Michael for suggestions.

In one of my previous hard copy mail letters to you I mentioned that I had built a 'Mini-Horten' 2m R/C flying wing from plans found in a French modeling magazine. I have just recently dug this magazine up and if you want a photo-copy of it (its in French but the plans are easy to follow) I can send a set to you. It uses Horten airfoils whose coordinates are given in the article.

Finally, my subscription renewal is about to be mailed. I really like receiving the newsletter. I'm hoping to be able to use this E-mail to get more involved in the flying wing community.

Thanks again,

Glenn Sembroski
(sembrowski@purvsb.physics.purdue.edu)

Ed. - Thanks for my first Internet message. It was exciting to see that the whole thing worked, since I didn't really know what I was doing when I clicked on the send icon.

I am not sure what you mean by a server list, but I do have an address book capability within the E-Mail Connection software that works with the Prodigy Windows program. My message to you was typed into it, off-line, selecting your pre-set address and then having it sign-on to Prodigy and transmit out over the net. I have added Jim Ealy to the book, and I am sure more will be added over the months. I will also publish them as they become available so we all can exchange messages.

The other nice thing about this method is that I saved your message into my word processor, edited out the extra carriage returns and here is the finished product. No time spent typing in long letters. (This could be a great way to put a newsletter together.)

Jerry had some smaller scale plans drawn up before be passed away, but we were not able to get a hold of them. He was also in the process of building a 1/3 scale version for testing, but it too was not completed. We sure do miss his enthusiasm for flying wings and seeing some of his unique ideas on a fairly regular basis.

Keep us informed of your progress, and be sure to ask the members for assistance if you find it necessary to overcome some of those things you didn't want to learn.)

==========

1/24/95

TWITT:

Just a couple of things to bring to your attention.

The article on Latex is one. I wonder if anyone thinks they are sensitive to epoxy resins, when latex gloves might be the culprit?

Then there is the following, which is self explanatory. Got it off the 'net. *(ed. - There's that net thing again.)*

[Part 2: "Attached Text"]
Date: Mon, 23 Jan 1995 13:25:12 - 0500
From: Intervisa@aol.com
To: HANG-GLIDING@lists.utah.edu
Subject: Japanese TV documentary
Message-Id: <950123132509_3678951@aol.com>

Intervista communications is Japanese TV company currently involved in producing a high definition TV documentary about people who build things at home. If you or someone you know builds homebuilt hang gliders or parasails and would be interested in being included in our program, please contact Phoebe Campbell on (212) 254-2845 or by E-Mail on Intervista@aol.com. Thank you.

Hope things are well with you.
Best airtime,
Chuck (McGill)

(ed. - Thanks for both pieces of information. I will summarize the latex information in another part of the newsletter so everyone can determine whether they should see an allergist if they are having a problem.)

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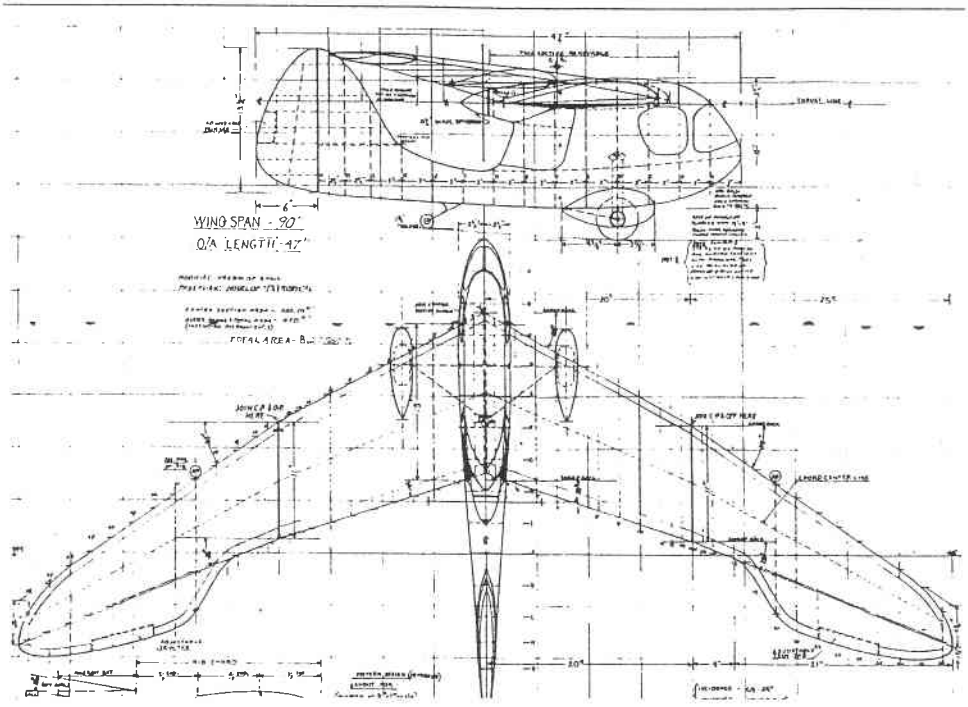
1/11/95

TWITT:

I am in full swing again after my 11th surgical operation since 1943 (WW II wounds) and constantly eager about tailless planes.



Help With the Pelican...

I am enclosing $22 as my 1995 subscription renewal, plus $2 for the #89 issue which I am missing; some time ago I had sent you two IRCs in lieu of dollar banknotes which I did not succeed in finding in my village. The missing issue never arrived, probably lost in the mail chaos.

I am enclosing some pictures concerning tailless activity in Italy, namely:

o One color picture of the PUL 10 twin seat (original Horten design).

o Two color pictures of the "RAMPHORINCUS" being built by Cesare Frau; it has been mentioned in the issue #99 (Sept '94).

o Sketch showing a 1943 rocket powered tailless model built during WW II for a competition sponsored by the magazine ALI DI GUERRA (Wartime Wings). The competition was never held because of wartime events, but later on the model was successfully flown as a free flighter. Wingspan is 80 cm and is of all balsa construction.

The other two items are for you American guys to look after:

o A sketch showing the PELICAN tailless model designed by Melvin J. Howland, 568 Central Avenue, Apt. 5, Jefferson, LA 70121. The sketch was published in the November 1982 issue of MODEL AIRPLANE NEWS. Could anyone in the US volunteer to get more information from Mr. Howland?

o A color picture of the F-16XL which appeared in the Italian magazine VOLARE (FLYING) along with an interview with a lady test pilot, Marta Bohn-Meyer. It would appear that this experimental plane, built for NASA by Boeing, McDonnell-Douglas and Rockwell, is being used for research on laminar flow for the proposed HSCT (High Speed Civil Transport). To this effect, two "gloves" (made with fiberglass and foam) are being experimented with on the leading edge; one is defined as "passive" (I don't know what that means) and allows one to examine the fluid dynamics at the leading edge at supersonic speed, as well as, to determine the pressure fields with both laminar and turbulent flows, and the noise level.

Another glove being tested is defined as "active, of the depression type" (again I confess my total ignorance); perhaps some attentive reader or TWITT will succeed in debugging this matter.

The last attachment to this letter is a page taken from CONFIGURAZIONE TUTTALA, which is the Italian version of my text TAILLESS TALE printed in the US by B² STREAMLINES. You will notice that in the lower part there is an advertisement inviting Italian tailless fans to join TWITT. Let's hope that many follow the suggestion, which I have put there at no charge for TWITT.

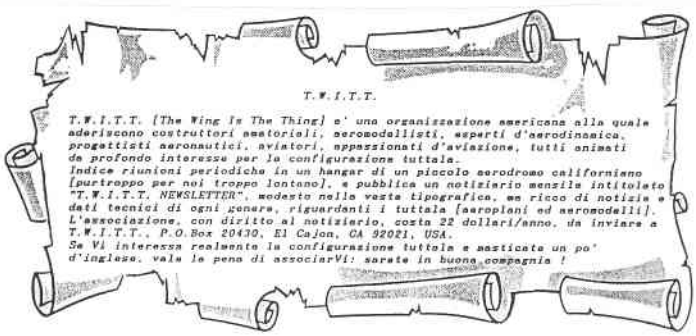
Ending remark: it would appear to me that the roster published in issue #101 has a mistake on top of the second column. It should read: Leo Bettini
Via San Carlo Borromeo 52
55049 Viareggio (LU) Italia

Sincerely,
Ferdi Gale'

(ed. - Thanks for all the material. I will for sure put the drawing of the PELICAN and a smaller version of your Italian TWITT ad in this issue. If I can get half-tones done of the color photos, I will also try to fit them in, however, it not they will show up next month.

Not being an aerodynamicist, my best guess at to the passive and active nature of the F-16XL gloves would be: active - some types of dynamic changes can be made in-flight or on the ground that will alter the airflow across the wing; passive - the glove has only one shape that cannot be changed and acts as a control to the experiments being done with the active portion.

Okay you experts out there, let's hear from you explaining what it all really means. Certainly we have someone who has worked on or around this project and can give us the necessary insight to this type of flight testing.


T.W.I.T.T.

T.W.I.T.T. (The Wing Is The Thing) e' una organizzazione americana alla quale aderiscono costruttori amatoriali, aeromodellisti, esperti d'aerodinamica, progettisti aeronautici, aviatori, appassionati d'aviazione, tutti animati da profondo interesse per la configurazione tuttala.
Indice riunioni periodiche in un hangar di un piccolo aerodromo californiano [purtroppo per noi troppo lontano], e pubblica un notiziario mensile intitolato "T.W.I.T.T. NEWSLETTER", modesto nella veste tipografica, ma ricco di notizie e dati tecnici di ogni genere, riguardanti i tuttala [aeroplani ed aeromodelli].
L'associazione, con diritto al notiziario, costa 22 dollari/anno, da inviare a T.W.I.T.T., P.O.Box 20430, El Cajon, CA 92021, USA.
Se Vi interessa realmente la configurazione tuttala e masticate un po' d'inglese, vale la pena di associarVi: sarete in buona compagnia !

We at TWITT appreciate you placing our information in your Italian language book. We hope that by advertising your English version in the TWITT Newsletter has created some additional sales for you. Much of our classified section is on just such an exchange program, since many publications like ours cannot afford to pay for this type of advertising, so it works out for everyone.

I will make sure to update Leo's address in the database to ensure he gets his newsletter correctly.)

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1/16/95

TWITT:

These two references sound very interesting! How can we get them? I'll try the WPAFB (Wright-Patterson Air Force Base) technical library one of these days.

Karl (Sanders)

(ed. - I will list the two references below. Perhaps one of our French members, Gene Rudat or Alain Mirouze, could go a little research and come up with copies of the articles and a summary, in English, of the key points. They look a little long to expect a full translation, but would make nice additions to the library in the event a member wanted to take on such a project for his own purposes.)

"The Problem of the Tailless Airplane and the Fauvel Flying Wing", C. Fauvel. Simple, light and strong form of construction obtained with this type of wing, latitude in centering, safety features of the design, trimming in bad weather, and landing are discussed. Various Fauvel flying wings described in detail include the A.V.2 light airplane powered with a 20 hp engine, the A.V.3 glider, and the A.V.10 two-seater powered with a 75 hp Pobjoy engine. L'Aéronautique, October 1936, pages 205-213, with 12 illustrations.

"Problem of the Tailless Airplane and its Solution in the Fauvel Flying Wing", C. Fauvel. Development of the Fauvel flying wing and its static and dynamic longitudinal stability, and transverse and directional stability as determined by wind-tunnel tests are described. Controllability and maneuverability, and the aerodynamic qualities of the formula are also discussed. Object of the research described was the design of a tailless airplane having a static stability equal to that of the best type of airplane with a tail, complete maneuverability, a total drag at average and small angles less than that of the best type of airplane with a tail, an advantage in weight, and simplicity of construction. Long discussion. L'Aéronautique, September 1936, pages 178-184, 4 illustrations.

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2/5/95

Mr. Phillip Burgers:

Since our New Year's conversation on bird flight characteristics, I have observed hawks in free flight and on television. I have closely watched gulls while feeding them in slow flight.

The hawks would twist their tail toan approximate 45° angle to the body and roll into a fast turn started by pressure of the banked surface which would be called an elevon, or ruddervator, but never a flap.

The gulls used their tail to increase area in order to fly slower using the tail as a flap.

What are your thoughts?

Bob Fronius

(ed. - There has been a long series of discussions between Bob and Phillip on this subject, and Phillip is working on a thesis that explores the flight of birds. Bob's empirical studies have shown some definite trends, but there could be more there than meets the eye.

Bob is looking for some feedback from Phillip, however, I would like to see of any of our slope soaring modellers have any other unique observations obtained when "flying with the birds". If you have any photos of unusual bird configurations while in flight, Phillip could probably use them (don't expect them to be returned,

so make sure they can be spared).

Although birds are very complex flying wings (with some tail action) there is surely a lot more we can learn about tailless flight from observing and analyzing their performance.)

MORE ON ELECTRONIC MAIL (E-MAIL)

The following was extracted from the November/ December 1994 issue of Ultralight Soaring News, the newsletter for The United States Ultralight Soaring Association. The article in SOARING, March '94, pp. 35-37, gives a lot more information on how to use their bulletin board and what types of information you can expect to receive.

Messages with articles to, or questions for, Ultralight Soaring News:
E-Mail to: rwr-usn@win.com

To find out more about the hang-gliding forum and to receive daily digests of their soaring discussion, send E-Mail to:
hang-gliding-d-request@lists.utah.edu
with the word HELP in the subject line.

To receive files from the SSA's Bulletin Board System via E-Mail, send a message to:
mailserv@ssa.org with the word **help** in the message body.

SSA's Internet Newsgroup:
rec.aviation.soaring Where the action is! If your Internet provider has a "newsreader" function, subscribe to "rec.aviation.soaring - otherwise contact the SSA Internet Guru, Guy Ford Byars, at E-Mail:
guy.byars@ssa.org

"Allergy Takes the Gloves Off"

(Nation, issue and pages unknown.)

Latex sensitivity is worse than other allergies because the substance is so hard to avoid in many settings. What may start out as a mild irritation could turn into a life-threatening and career-ending allergy to latex rubber, the key ingredient in surgical gloves. Wearing the gloves is not the only problem, since the latex powder can come in contact with the mucous membranes - eyes, nose or lips.

Although this is having a more profound affect on people working in the medical professions, with more people wearing gloves, there is more exposure to latex and more chance to develop an allergy. Researchers are not sure exactly how it all got started, but are realizing it is a serious problem which will take time to resolve. The obvious solution is to come up with an alternative material for surgical gloves, but this is proving harder than expected.

If you notice any unusual rashes or eye/nose or throat problems after working with latex gloves (especially without additional exposure to resin based materials) you might want to consult your doctor or a an allergist. For some people who didn't catch it early enough, it became a debilitating condition and severely limited where they could go, let alone be able to work since many businesses use some type of latex product.

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.

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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