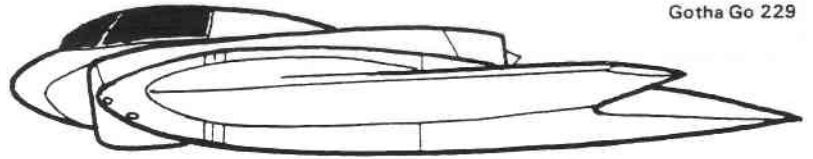


T.W.I.T.T. NEWSLETTER

Gotha Go 229



Gotha Go 229

Development of the Horten Ho IX as a twin-jet flying-wing fighter (see page 89) was transferred to the Gothaer Waggonfabrik in 1944 under the RLM designation 8-229. The Ho IX V1 was a glider, while the V2 was fitted with a pair of Jumo 004B-1 turbojets. Both flew in 1944, the V2 under power. The latter was destroyed very early in the programme, and a third prototype was built by Gothaer Waggonfabrik.

The first Gotha prototype (Go 229 V3) differed from the Horten versions in having a shallow bulge on the underside of the centre section and straight air intakes instead of the upswept arrangement used on the Ho IX.

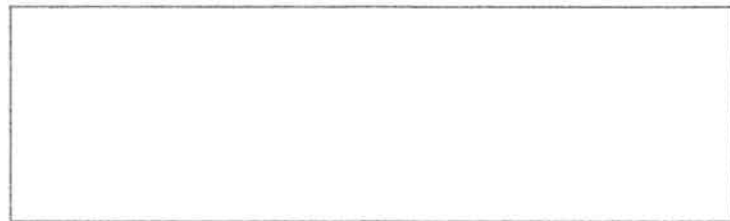
The aircraft took the form of a pure wing with tricycle undercarriage and a central cockpit section with a turbojet on either side; there were no vertical control surfaces.

The V3 was never flown, the factory having been occupied by Allied troops before it could be completed. The V4 and V5, intended as two-seat night fighter prototypes, were also near completion, and work on the V6 and V7 armament testbeds had started. Preparations for the production of an initial batch of 20 Go 229A-0 fighter-bombers were also under way.

From: David Masters' German Jet Genesis

Contributed by: Kevin Renshaw

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., 9104 means this is your last issue unless renewed.

Next TWITT meeting: Saturday, APRIL 20, 1991
beginning at 1330 hrs at hanger A-4, Gillespie
Field, El Cajon, Calif. (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 types of tailless aircraft by providing a forum for the exchange of ideas and experiences on an international basis. T.W.I.T.T. is an affiliate of The Hunsaker Foundation which is dedicated to furthering education and research in a variety of disciplines.

T.W.I.T.T. Officers:

President, Andy Kecskes (619) 589-1898
 Vice Pres., Dave Pio (619) 789-1650
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Editor (Acting), Andy Kecskes

The T.W.I.T.T. office is located at Hanger A-4, Gillespie Field, El Cajon, California.

**Mailing address: P.O. Box 20430
 El Cajon, CA 92021**

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Meetings are held on the third Saturday of every month, 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).

PRESIDENT'S CORNER

As you will see from the minutes, I missed the March meeting due an anniversary obligation to my wife. Unfortunately, we didn't win anything at the gambling tables, but it sure was good to get away from it all for a couple of days.

If you scanned through the masthead information you probably noticed we have published a table of overseas rates. For new members, or those who want back issues, we have found it is cheaper to do it in bulk. If you want some number in between those shown, figure out an approximate amount of postage and add it to the number of issues price. So, if you are a new foreign member and are considering ordering back issues you may be better off ordering everything at one time.

If you haven't already planned your Labor Day holiday, set it aside for the Sailplane Homebuilders Association get together at Tehachapi. Bruce Carmichael is putting the program together, and we are planning to use the opportunity for several TWITT activities. There will be a TWITT meeting on Saturday evening, a raffle for a glider ride as the prize, some speakers, and models.

It will be a good time for many of the central California members to meet with us at a site a little more convenient than San Diego. We will let you know more about the details as they are put together, but for now reserve Saturday and/or Sunday for an outing to Tehachapi.

We are interested in developing a logo for TWITT. Gill Metcalf submitted one that was published in the October 1988 newsletter, but we never had any real comments about it. Since then we have added a lot of new members, so we would like to see what you can come up with. We are not publishing Gill's version to prevent you new guys from getting some limited ideas. Let the creative juices flow, and if you're not an artist give us a rough draft we can have someone else refine for you. The logo would be used on letterhead, hats, name tags, etc., so people could tell at a glance what TWITT is all about.

I received a phone call from Dr. Karl Nickel in Germany the other morning asking if we had received a copy of his manuscript or book, Schwanzlose Flugzeuge, which he co-wrote with Michael Wohlfahrt. He is ready to begin an English translation, and I told him we had decided this would be a good project for TWITT during 1991. He was most agreeable to the

help, so we need to find some other members, besides Mark de Piolenc who is currently working on it, who have some capability in the German language that can assist us. We would plan on sending you a copy of a chapter or section to work on over a couple of months. I presume that all those who participate will be acknowledged once the English version is published. Please let us know as soon as possible if you are willing to take this on. We promise not to give you any more than you think you can handle.

I would like to thank Bob for hosting the meeting last month. I just wish I could say the trip to Nevada was a profitable one, but like most people I just helped them pay for their new casinos.

Well, that's about it for this month. Keep reading the newsletter for announcements of upcoming events, and if you know of any in your local area be sure to send us the information so we can let everyone know.

Andy

APRIL PROGRAM

We are privileged to have Mr. Ed Leiser, Curator of the San Diego Aerospace Museum, as our speaker this month. He has been a long time contributor of TWITT newsletter covers, and is a well known San Diego aviation historian. He will be showing slides, telling jokes, and talking about former flying sites and airports in the San Diego area. He is an excellent speaker, and I am sure you will find he welcomes audience participation for those of you who would like to know more about anything to do with aviation.

Bob says this is a good program to bring the wife and kids, since Ed has something of interest for everyone. So make a family outing of it, and come see us on Saturday.

MINUTES OF THE MARCH 16, 1991 MEETING

The meeting was opened by Bob Fronius, substituting for Andy, Dave, and Philip. Bruce Carmichael introduced Eugene Larrabee who is a former MIT aeronautical engineer and agreed to speak to the group later in the meeting. Bob Chase introduced himself by explaining about many of the flying wing and ultra light aircraft he has built and is currently experi-

menting with. Hopefully we can get him as a speaker for some future meeting. Michael Haidvogel from Austria introduced himself. He is in the U.S. getting his instrument rating, since flying time is much cheaper here than in Europe.

Bob announced the raffle prize for the day would be T-shirts with whatever picture the winners decided they wanted on the front or back.

Bob mentioned that someone had asked if anyone had heard of a Schweizer 1-30 powered aircraft. It has (had) a 1-26 wing and tail group, and about a 65 hp engine. There is a model kit of this plane on the market, and this person is trying to find out how many planes were made and if there are any remaining, either in flying or non-flying condition. If you have any information, please let us know.

Professor Larrabee then took the floor to relate some of his experiences. While at MIT, his specialty was in providing the aircraft design courses so that the graduates would have some practical preparation for the industry. His application of the Betz propeller theory to obtain propellers of minimum induced drag lead to marked improvement in man powered aircraft performance. He was part of the engineering and design team for the man-powered flight of the Daedalus across the Mediterranean between two Greek islands.

Although he is not a flying wing enthusiast, he had an opportunity to work with some of R.T. Jones theories on the optimum form for an aircraft flying at supersonic speeds. Jones proved through his mathematical formulas that the best shape for a supersonic aircraft was a high-aspect ratio, elliptical shaped wing. This was also the best shape for sub-sonic planes. The only difference would be that at supersonic speeds the wing would fly at an oblique angle so it flies behind the Mach cone formed by the forward tip. This give it a lift to drag ratio of perhaps 15 or so at Mach 1.6. Speeds much higher than this cause many other problems which cannot be overcome.

This type of configuration presents some other problems. They would be span loading aircraft, you would need to be able to stand up inside them which means an airfoil at least 8' thick, which necessitates a chord of about 80' due to the oblique angle flight. The aspect ratio of the oblique wing to the root chord should be about 8, which gives a wing of 640' span, controlled by trailing edge flaps.

Jones was aware it is not easy to control

the wing with only trailing edge flaps, if you insist the CG go back to about 40% chord so people can stand up. By trying to control it with trailing edge flaps you find the center of lift due to flap deflection is close to 50% of the chord as the flap becomes smaller. If you make the flap bigger the center of lift actually moves forward. If you move the CG back to about 45% chord you couldn't control the wing with flaps since there would be no ability to affect the pitching moment.

The use of automatic flight control systems would handle the CG this far aft, but it presents the problem of how to abandon the ship if it should fail. It becomes an interesting problem in problem solving, since there are not many runways that can handle a 600'+ wing. Jones did suggest never flying it with less than a 45 degree angle to keep it within the runway confines. Takeoff and landing present new problems when you do this because of the drag devices needed for landing approaches. Maybe this could be solved using split elevons, like on the B-2.

There are also problems with the engines. Jones doesn't like putting the engines on top of the wing due to the complex transonic flow with kind of a three dimensional character that takes place. Therefore he would put the engines under the wing. This means you must have enough pitching authority in the flap to control it. Since the engines are spread out spanwise, perhaps you would need a pair of rudders to exert a yawing moment, with one ahead and one behind the CG.

Another problem is what kind of landing gear to you put under it. Some people think it should be put anywhere it is convenient and takeoff at a fixed ground angle. Larrabee has been worrying students at the Northrop University who are taking an advanced design course. With those observations complete, he offered to prepare some viewgraphs and come back another day to talk more about the oblique wing.

After a video on strange aircraft shapes, Bob introduced Jerry Blumenthal, who was our featured speaker this month. Jerry is a retired model builder from the Convair division of General Dynamics. He has designed a number of different types of aircraft and built models of many for test purposes. The center fold of the newsletter is a collage of some of the designs he went on to talk about. They are not labeled, so you will have to interpret which is which. There really is no free lunch, right.

Jerry began with an overhead viewgraph showing many of his designs, some of which he would talk about later.

Jerry started his more detailed presentation by talking about the POLLEN SPECIAL, a home-built design that can do 327 mph at 18,000' on a turbo supercharged, fuel injected four cylinder engine. He looked at from the standpoint of what could be done to make it even better. One of his designs, the HYPER POLLEN, which he made a pusher with a cowling around it. It included a delta canard, which he thinks is one of the only designs with this type of configuration.



SPEAKER/DESIGNER - JERRY BLUMENTHAL

Jerry then moved on to the BD-5, which he again thought could be made better. He made a delta canard out of it, with the cooling inlets just aft of the cockpit. He gave it a fixed main gear and retractable nose gear, with the wheel fairings behind the CG, therefore giving you directional stability, hence leaving them fixed. Jerry pointed out that he only builds models, knowing that if something works at the scale size it will work even better when converted to the full scale.

His next diagram was of a broad winged, Vee tailed aircraft with the engines mounted at the wing tips. Of course, they would be cross-shafted so engine failure would not present uncontrollable problems. This configuration also would allow burying the tip vortex in the prop wash, and provide constant airflow over the wing, thus lowering the stall speed.

With Torrey Pines as the backdrop for a design idea, Jerry came up with a cross between a Spitfire and the POLLEN SPECIAL. It was meant to be just a glider with skids under the wings and at the nose. The fuselage was inspired by the POLLEN SPECIAL, but the wing is blend of the Spitfire and Pollen wings. He called it the FYESPITTER.

The next design was inspired by the 1930s LUTTON BUZZARD. He calls his version the BUTTON LIZARD. One version was a powered sailplane with an semi-open cockpit, with the engine and wing blended together, and retractable gear.

He then presented his SIREN a low-wing, in-line, four cylinder plane. The wing goes straight across with fixed main gear and a retractable tail wheel. It had a split flap in between the gear, which also extended out past the gear to the ailerons.

He then showed his version of the POCKET FIGHTER, which would use a jet engine like on the Tomahawk cruise missile. He envisioned a group of Goodyear racers with this engine.

COUNTERFLIT was his next design, which was inspired by the counter insurgency roll. It would be powered by a PT-6 engine with retractable gear. He referred to it as a tight little airplane, so it must have had an exceptional power to weight ratio.

Just to show he doesn't always use canards, he showed us an American stunt bi-plane. He had swept back wings.

Jerry then showed some of his variations on the Horten flying wings. He mentioned that he doesn't like to go too far into designs that already exist. Trying to repeat what someone else has done is wasting time, so it is better to go after your own ideas.

Going back to canards, he had a sailplane design that had no rudder since he used slats at the tips to produce drag by dumping the lift over the entire tip area. They would combine with the aileron action to fight any adverse yaw tendencies.

Jerry then went over his series of flying wing gliders, starting with the MANTA. This had tip rudders which moved outboard only for yaw control. He was not sure if it had enough

inherent directional stability, but thought it might fly okay.

Another in this series was a blended wing which would use Horten type sequential drag rudders at the tips. It also incorporated a slotted elevator which achieved slotted flow with either up or down elevator movement.

The last one of the series to talk about was BULLS EYE, which has been on the newsletter cover. This was his attempt to break the pattern of design he had been using for the others. The pilot lies in a supine position, with long blended wings which come back into the delta shape. He uses split flap, Northrop type yaw control systems, with spoilers on the central section of the wing, and normal elevators on the trailing edge of the delta section. Some of the engineers noted it would probably mimic a bell shaped lift curve. His stability model has excellent stability without the use of a rudder.

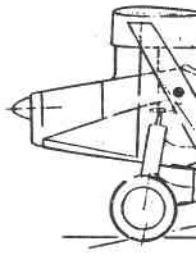
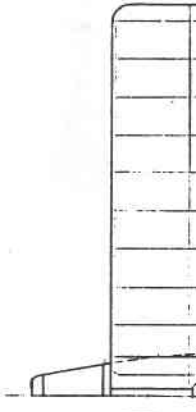
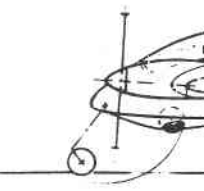
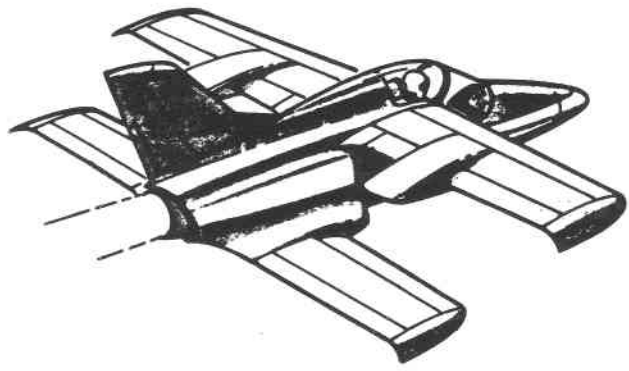
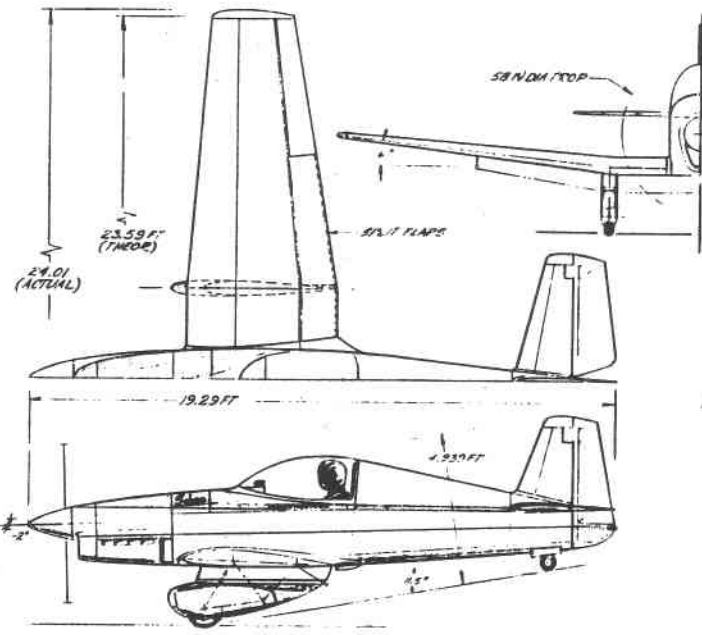
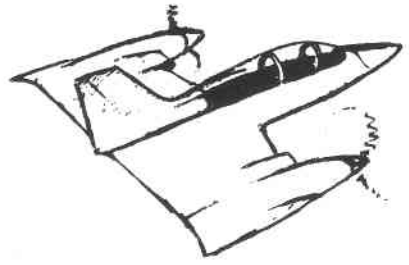
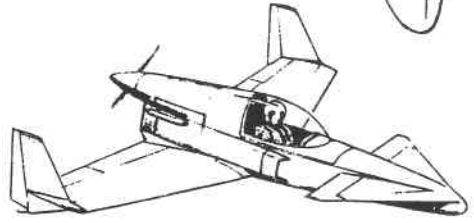
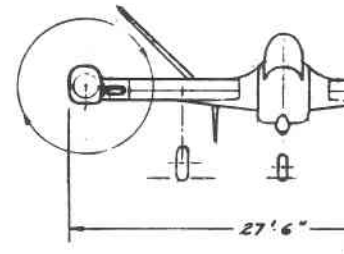
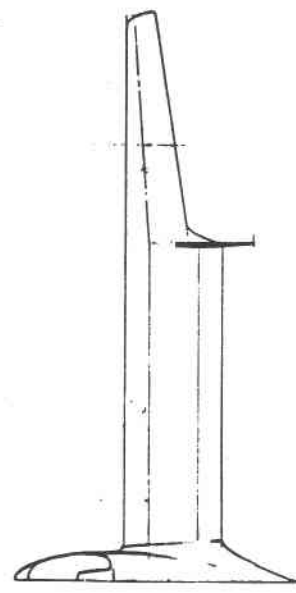
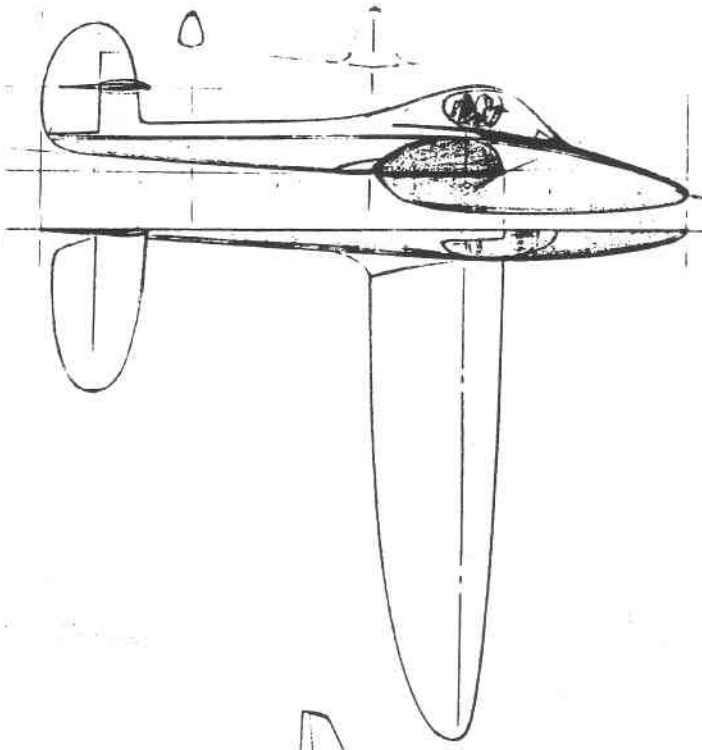
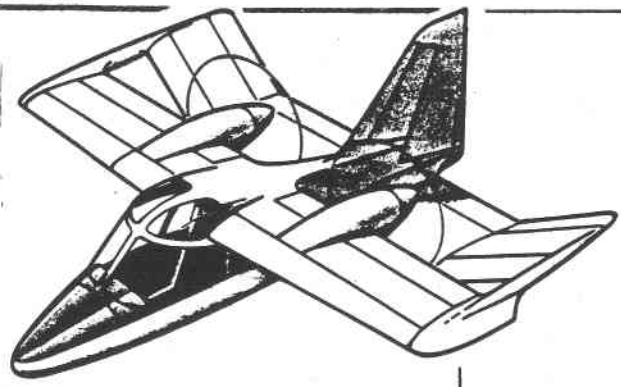
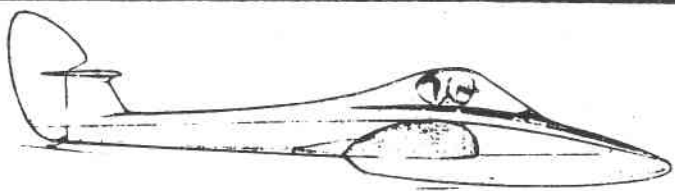
The next one he showed seemed to be the best layout for a single engine pusher, so far. It used the Chuparosa wing with single spar construction at the one third chord, a 48" ground adjustable four bladed propeller, wing to be joined at the tips with drag rudders and area plates for stability. Dihedral on the lower wing would have lateral area behind the CG for directional stability. Ailerons on upper wing only, with the inboard area for flaps which would not cause a pitching moment since they are at the CG. The plane would sit on the ground with the upper wing at zero angle of attack and the lower at minus 2 1/2 degrees for best takeoff acceleration. He felt there would be enough elevator authority to rotate the whole assembly.

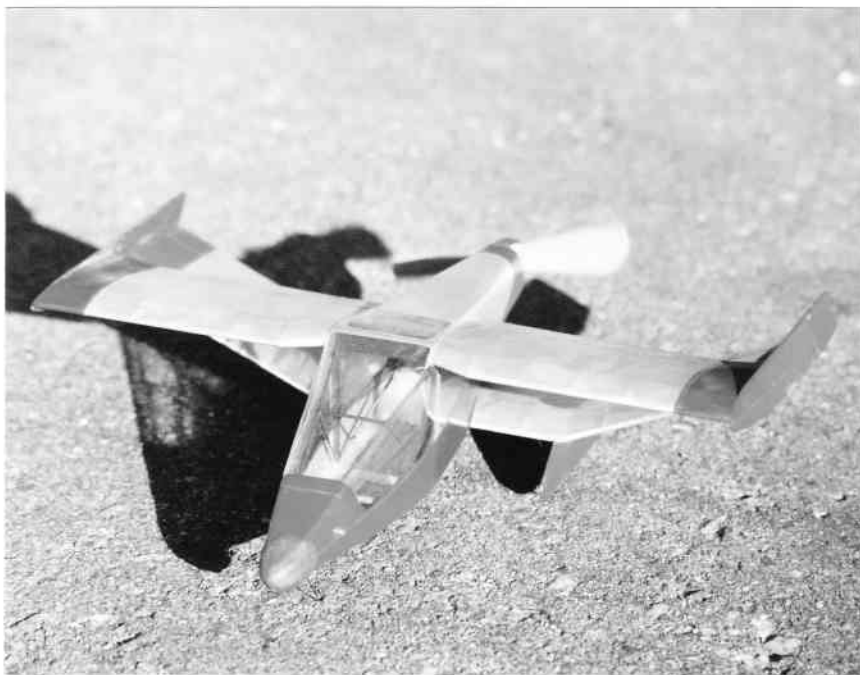
It was designed to have two wheels close together, with small outrigger wheels at the dihedral break of the lower wing. The joining of the wing at the tips allowed for an overlap of the upper over the lower so the upper wing was acting like a slot for good stall recovery.

He had also designed a tractor version which contained some unique features that allowed for easy maintenance of the engine and control systems.

Jerry wound up his presentation with a quick overview of several other projects he hopes to get to in the near future. There was a little interchange between Jerry and Professor Larrabee on some fine points of one of the designs, which Jerry seemed to appreciate.

Bob held the raffle, which was won by Budd Love and Larry Nicholson. It will be interesting to see what types of pictures they have





put on the T-shirts.

Bob introduced Alex Kozloff who talked about building light weight wings using wood and/or foam. He passed around a small sample of a boat mast he had built using aircraft 45 degree spruce plywood to form the front and back of a box beam the would take the bending load. To this he had added some fiber glass stringers and then covered with it with graphite to finish the box. He added a foam leading and trailing edge shape, and then wrapped the whole thing in 1mm birch plywood, applying a vacuum bag around it to pull it into shape. He pointed out that you must make the bag's opening at the trailing edge so it will pull out the excess resin better.

Bob showed Alex some 1/64 3 ply sheets he had picked up. Harald Buettner indicated that a flying wing had been built using just foam and the 1/64 ply wrap, and it was extremely strong. Jerry mentioned the construction technique where he had used brown paper to cover the foam core, as reported several months ago. Alex found this interesting, especially since it could be water proofed.

It appears the meeting was adjourned due to the noise from an airplane engine being run up outside the hanger.



Harald H. Buettner

Box 710 635, Santee CA 92072-0635

(619) 562-9058

LETTERS TO THE EDITOR

TWITT

Enclosed are a few more drawings of various tailless aircraft. All of these drawings are 1/72 scale, since they are the reference drawings from models in my collection. Please give appropriate credit to the model companies.

The AVRO 707 series was used in the development of the Vulcan bomber in much the same way Northrop used the N9M to test the aerodynamics of the XB-35.

The Lippisch DM-1 was tested extensively by NACA after the war. Tests were conducted in the 40' X 80' wind tunnel and the data was used in the development of the XF-92 and F-102.

The N1M drawings show both versions, with and without the tips cranked down to act as vertical surfaces. The N1M has been completely restored by the Smithsonian and can be viewed at the Paul Garber Restoration facility in Silver Hill, MD.

More later,
Kevin Renshaw

(Ed. Note: Along with the drawings Kevin noted he also included one of Ryan's X-13 Vertijet. We would like to thank Kevin for sending them to us on 11" x 17" paper all ready for publication. We will include them as space permits over the next several months.)

TWITT

March 3, 1991

Enclosed is the current (further expanded) Appendix to the bibliography; perhaps it will prove useful in cataloging material in the TWITT library, if you decide to organize part of it by designer. As you can see, I've decided to make it more comprehensive, adding planes and proposals previously omitted intentionally as well as some of which I had been unaware. If you notice any omissions or inaccuracies during your work, I'd like to hear from you.

I am maintaining supplements to both versions of my bibliography, although the supplement to the original is becoming so lengthy that it may soon have to be discontinued. An up-to-date supplement to the current

version accompanies each new order.

Thanks for the continued good work on the newsletter.

Serge Krauss

(Ed. Note: You can find an advertisement for Serge's bibliography elsewhere in this issue. We will add this Appendix to our copy in the TWITT library. We have not started organizing it yet, since the computer still does not have an operational hard drive.)

Dear TWITT:

Yes, I will join your group. I am looking for "wings." I am a builder of radio control and free flight models up to ten feet, due to transportation and the storage.

I love three views. Your "Manta" of 15 meters is just great. One could have a ducted fan or props at the rear.

Wings are not my only interest. If it will fly, it will be a wing. But submarines, torpedoes, dirigibles, gull type bird wings, amphibious autos, and many others. I do not use "liquid" power, but only electric, CO2, rubber, rockets, etc. Most are float type aircraft, sea planes, flying boats, and flying amphibious cars.

I knew a Mr. Hatfield at Northrop. He had photos of a flying wing sea plane. About 1943, Kaiser and Northrop joined to build a troop transport to invade Europe. I would like to have a copy of that aircraft.

As you can see, I will not be too much help for you, but you will be very helpful for me.

I am now 55 years old, retired electrician, handy person. I have been building, playing, designing, and wiring since about 10 years old.

Thank you sirs,

Eugene F. Turner
12469 Walsh Avenue
Mar Vista, CA 90066

(Ed. Note: Gene also included the names of two people he thought could be of assistance to TWITT. One was Serge Krauss (same as above) and the other was Frank Zaic of Sepulveda, CA. As Gene will learn, we don't expect any member to be a contributor as part of membership. All we ask is that if you have something that might be of interest to others like yourself, please send us a copy or take a picture of it, etc. Everyone is looking for new ideas or

something from the past. Welcome to TWITT, Gene.)

March 28, 1991

Dear Bob and June:

Here is what I promised you on the phone. I hope you get it in time. Feel free to publish all of my annotations and remarks! I wish to add this one though: I feel honestly that for commercial carrier operations a flying wing or tailless (like the Douglas study) is an unsuitable configuration. This is because geometric constraints prohibiting length or spanwise stretch/shrink to adapt to payloads (cargo or passengers alike) and route structures. That can only be done with constant section fuselages and - judging from the evidence - very successfully so! The geometrical constraints I mentioned have to do with maintaining balance, landing gear position, ground clearance (wing tips at take-off rotation, tip-back, etc.) and also with certain bending moment restrictions, when extending the span or root chords to achieve more volume.

So, that leaves special purpose applications (certain bomber types, high altitude range/endurance reconnaissance, records, etc.) as ideal for the flying wing concept.

(Ed. Note: Karl has contributed to TWITT on numerous occasions, and has been a speaker at our meetings. I don't recall us ever providing any background material on him, and he has now given us some so you will know from what type of experiences he derives his thoughts on why wings may not be the best solution to some aviation problems.)

As for myself, I finished studies in aeronautical engineering in 1942 in an engineering apprenticeship program sponsored by the then German government. In 1948 I immigrated to Argentina to work with other engineers/designers "of fortune" (among them Reimar Horten) on advance fighter and transport projects (they flew!! - so well, that the then U.S. Air Force Secretary Vandenberg (1950) wanted to ship some of them to Edwards!). In 1956 I moved to the U.S. and until 1959 was with TEMCO (now part of LTV) in pre-design on advance version of their TT-1 Navy trainer. Then came Solar, Ryan ('59-'73), NWC China Lake ('73-'76), Northrop ('76-'90), then an aborted stint back to Ryan (sorry, TRA!!) till September '90. I do some work for Sandaire now.

Chau, Karl

(Ed Note: Do you notice some similarity between Karl's remarks on wing size, gear location problems, etc. that were noted by Professor Larrabee in his talk on the oblique wing. Karl also sent us an article from the Northrop News, March 8, 1991, which says there will be a program titled "The Wing Will Fly," which will be telecast at 5 pm and 9 pm on April 14 on the Discovery cable channel. A copy of this article is included elsewhere in this newsletter. Thanks you Karl, for the comments and the article. Please come visit us again soon.)

Dear TWITT:

Enclosed find a "flyer" for my wing contest. Maybe someone will build for it. It will be flown on Monday (Oct 7, '91) prior to the Old Timer Champs. Please pass the word.

Regards to all

Carl Hatrak

(Ed. Note: This is the 25th Annual Northrop Flying Wing Contest being held in Jean, Nevada, sponsored by Model Builder Magazine. Carl can be contacted at: 3825 W. 144 St., Hawthorne, CA 90250 for more details. Get a head start on your building, since October will be here before you know it. We will publish the "flyer" in the August newsletter as a reminder and let people know who may just want to go take a "look see.")

AVAILABLE PLANS/REFERENCE MATERIAL

Tailless Aircraft Bibliography

by Serge Krauss

Cost: \$20

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

Horten H1c construction drawings with full size airfoil layout. 30 sheets 24" x 36" with specification manual. Price: \$115.

Horten Newsletter

Cost: \$5 per year for US/\$7.50 foreign

Order from:

Flight Engineering and Developments
2453 Liberty Church Road
Temple, GA 30179
(404) 562-3512

The following was found in the "Los Angeles Times" newspaper on about May 4, 1990. Hopefully someone from TWITT will be able to provide some help.

RESTORING '40s Northrop N9MB Flying Wing, need experienced volunteer woodworkers. Saturday work only. Call David Murray at (818) 369-8056 for details.

FLYING WING SAILPLANE PLANS AND KITS: Two time-proven, 13m homebuilt designs suitable for the novice pilot. Build either the MONARCH "P" ULTRALIGHT (19 to 1), or the PIONEER II-D (35 to 1) sailplane.

Info packs \$8 each, or \$15 for both.

Marske Aircraft Corp.
130 Crestwood Drive
Michigan City, IN 46360

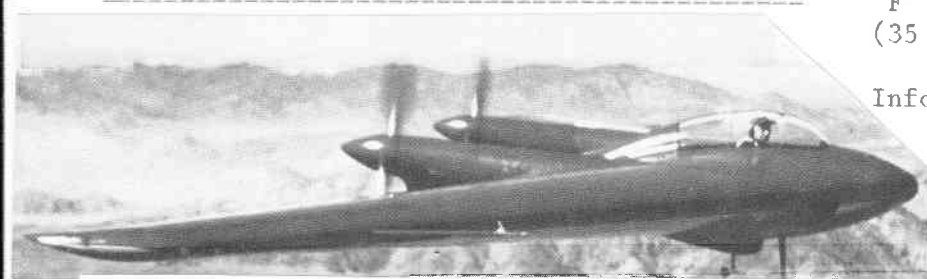
N-9M FLYING WING will be featured in upcoming documentary entitled *The Wing Will Fly*, which will be telecast at 5 p.m. and 9 p.m. Sunday, April 14 on the Discovery cable channel.

Boosters to preview wing documentary

Excerpts from the upcoming documentary entitled *The Wing Will Fly* will be shown at the next meeting of the **Vintage Aircraft Boosters** club, set for Wednesday, March 27 in the NRC Clubhouse on Crenshaw Boulevard. The documentary traces the evolution of Northrop flying wing-shaped aircraft, up to and including the B-2 bomber. It is scheduled to be shown at **5 p.m. and 9 p.m. Sunday, April 14** over Discovery cable television channel. In addition, John Benjamin will deliver a slide presentation on the N-9M restoration project, and many other events associated with the Flying Wing series of aircraft are planned. Activities get under way at 5 p.m.

NORTHROP NEWS

March 8, 1991



(1) The optimum wing planform for supersonic speed is a long narrow ellipse, the same as for subsonic speed.

(2) Experiments with such a wing have shown lift/drag ratios higher than other planforms.

Material to supplement the talk by Eugene Larrabee.

(3) The sweep angle of such a wing can be varied in flight by steering with rudders and by swiveling the engines.

(4) At zero sweep L/D values greater than 30 were measured. Such values can eliminate the noisy afterburner take off and the large fuel fraction (40%) needed by the delta wing for low speed maneuvering.

(5) By limiting the Mach number to 1.6 (twice current jet speed) heating problems are eliminated and fuel per passenger can be reduced to that of current long range jets.

(6) To accomplish these goals the flying wing SST will need variable bypass engines.

SUPERSONIC FLYING WING

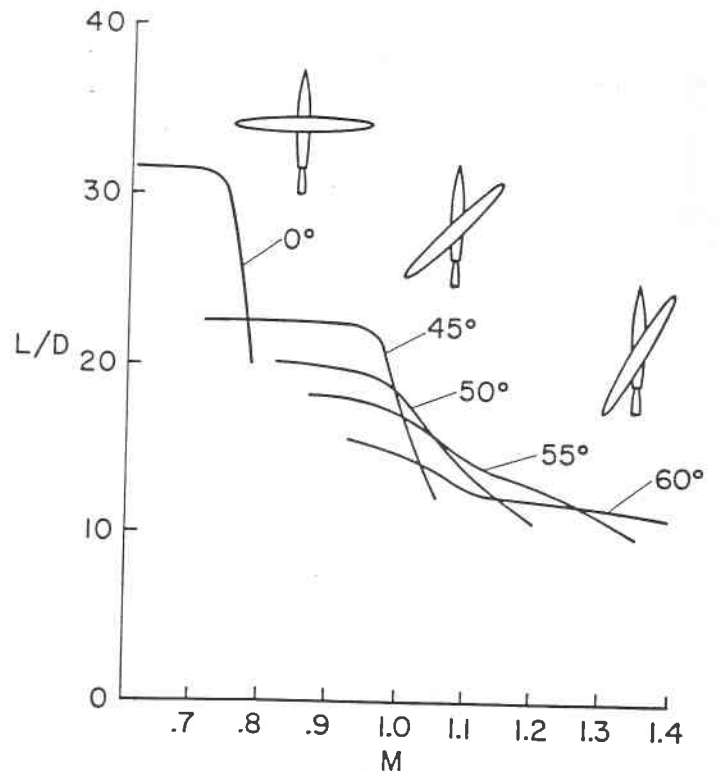
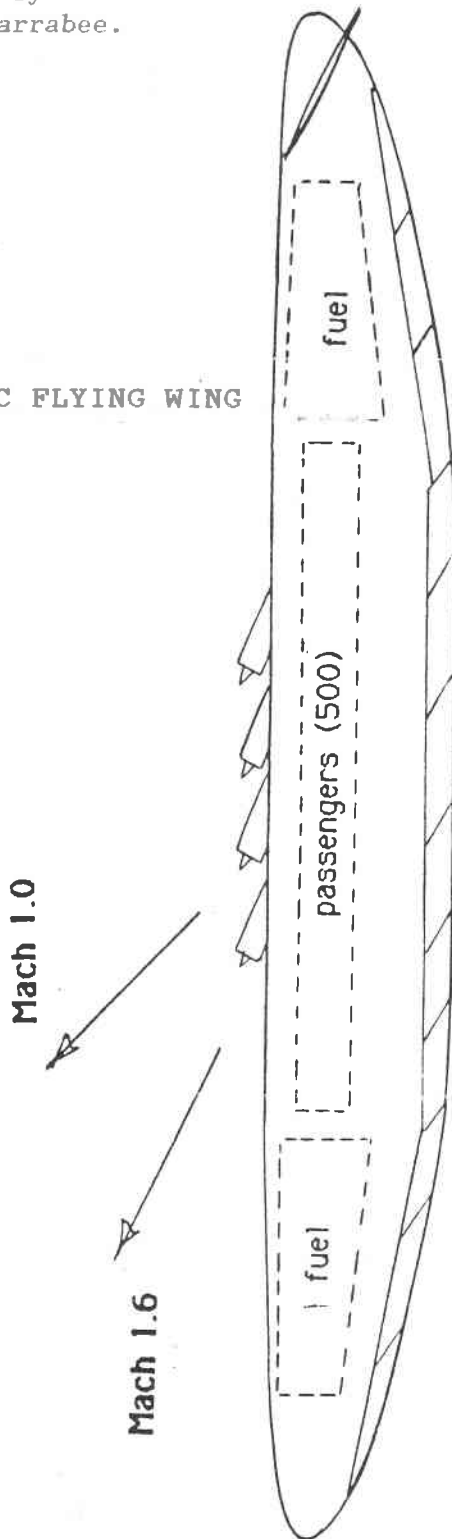
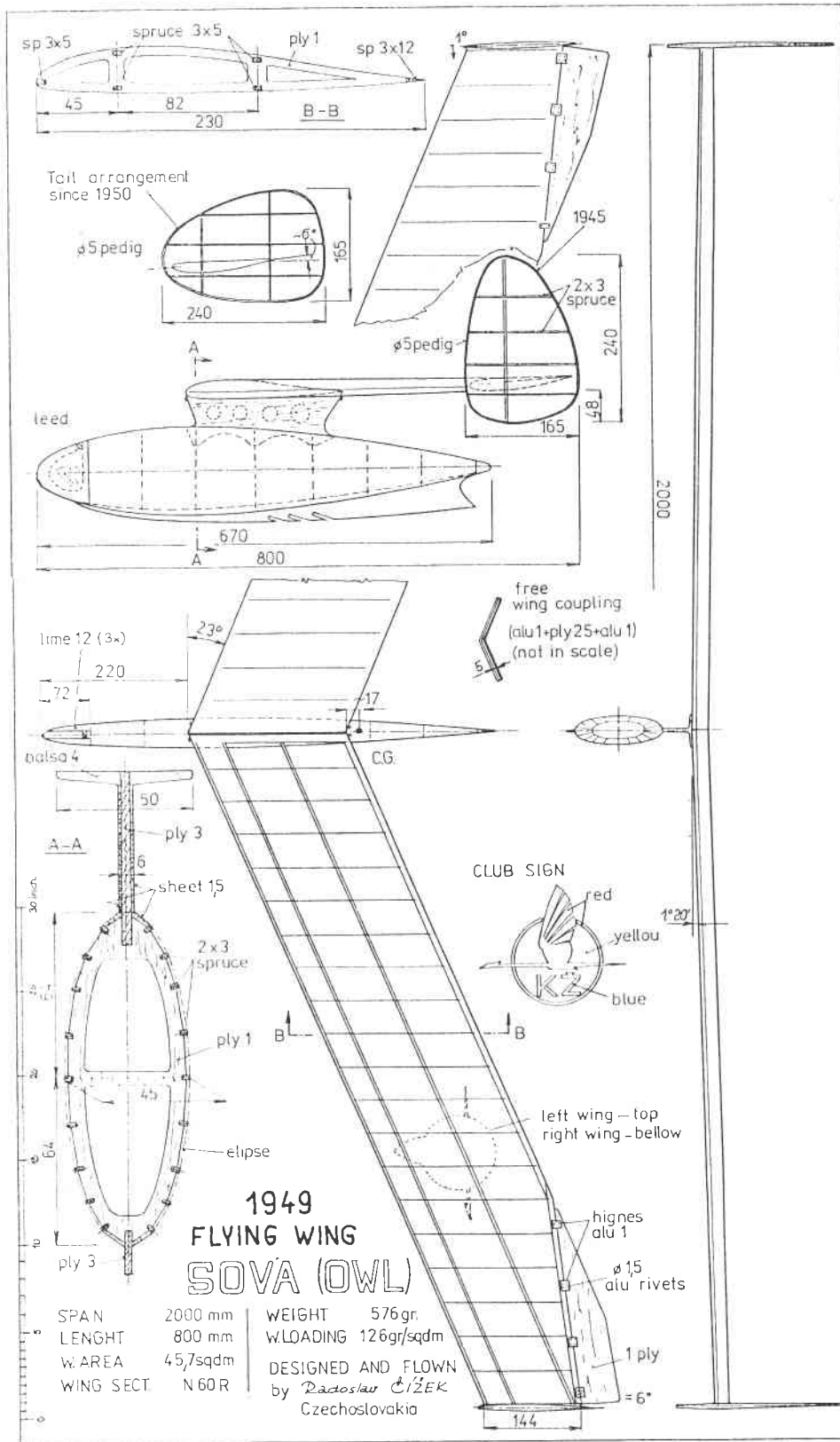


Figure 6, Measured Lift Drag Ratios of Oblique Winged Model

(Ed. Note: We cannot find who contributed this item, but thought it would be of interest to the modelers of TWITT.)

Two Owls

Rad Cizek designed and flew these two models in 1949 and 1950. Both flying wing gliders were built of spruce as balsa was a scarce commodity in Czechoslovakia in those years. Cizek said that he got flights of 65 to 70 seconds for the "Sova" and 75 to 80 seconds for the "Sova 2", both on a 50 meter tow line. Neither model has any dihedral.



Sova & Sova 2 -- Above a young Rad Cizek, in 1949, holds Sova and below he launches Sova 2.

