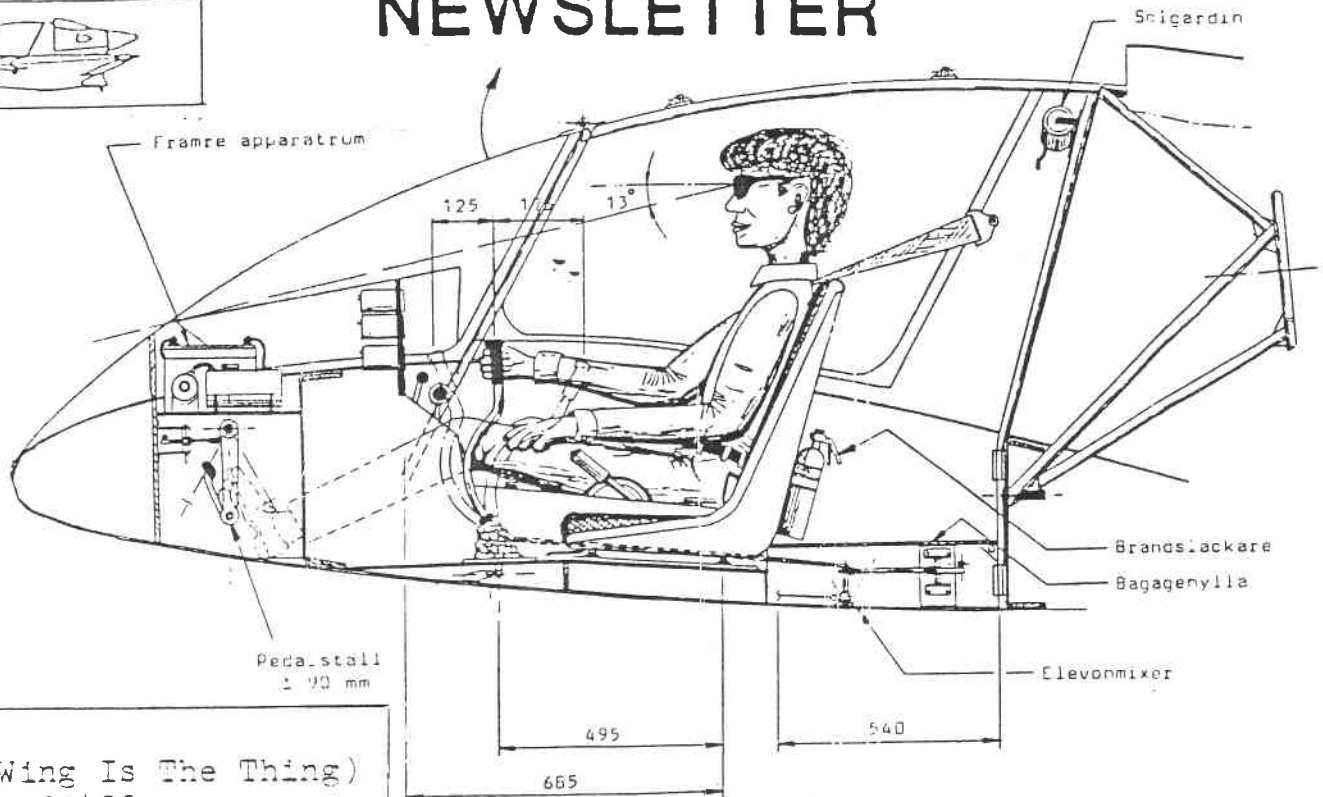
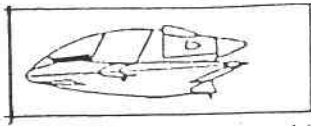


FLYING V HP1

TWITT NEWSLETTER



TWITT
(The Wing Is The Thing)
PO Box 20430
El Cajon, CA 92021

The numbers to the right of your name indicate the last issue of your current subscription, e.g. 8907 means this is your last issue.

Next TWITT Meeting: Saturday, January 20, 1990
Beginning at 1330 hours. The location is Hangar A-4,
Gillespie Field, El Cajon, CA. in the first row
of hangars on Joe Crosson Drive.

PRESIDENT'S CORNER

There is not a lot to cover this month, since activity has been rather slow with the holidays and all. I hope everyone got through them safe and sound and is ready for a new year of putting together the designs for a flying wing.

For those of you who can use more tax deductions, you can claim membership dues paid after November 1, 1989. If you just need the tax ID number for your records it is: IRS 95-6226533. If you need a receipt for your past or future dues, please send us a note and a self-addressed, stamped envelope and we will send you a formal receipt with the amount and tax number.

As you can see from the Letters column, Syd Hall took us up on the offer to record Harald Buettner's talk on composites. Since this organization is partly dedicated to education this seems like a good way to spread the word to those who have a special interest in a particular topic. We now have enough audio tapes to retain a meeting's minutes for about three months until the tape is reused. If there is enough interest shown in this type of dispersal of information we will set up a more formal program and attempt to get more tapes so information can be held for longer periods. Please drop us a note if you think you like to take advantage of this in the future. (For those of you who missed it, this involves sending us a blank tape and return postage of \$1.)

Although we received more mail this month, there still haven't been any new proposed plans for either full size or model flying wings. If we have the plans we can put together the right people for a review session during a regular meeting and provide the designer with constructive comments on the aircraft. This has worked well in the past and fits well into the overall goals of TWITT.

That is all I have for this month. I have been trying to cover different topics each month, but need more of you to write in asking questions or making proposals so I don't end up repeating myself to often.

LETTERS TO THE EDITOR

18 Dec '89

TWITT (Andy, Dave, Phil, Mark & Bob):

Compliments to you for the selection of that almost tailless design on the cover of issue #42, and my apologies to everyone for my letter published in that issue. I had expected it to be only read by the editor and not published. It was meant only as a request for more continuity in coverage. *(Ed.-Syd had some good points and we don't mind the criticism. Hopefully it will make TWITT better.)*

This is not needed by you who meet in El Cajon, but by us who are remote. We sometimes get lost.

Enclosed is a blank audio tape and \$1 for Harald Buettner's observations (I feel it would be of interest to many others to have his remarks published in TWITT, since learning by experience in this field of exotic composites is rather expensive, both to the health and the pocket-book.). Also, please, my thanks to him for setting me right on fillets and tips. Again, I am able to see that TWITT provides me with a continuing education.

You are all doing a fine job.

Syd

(Ed.-Unfortunately we only had part of Harald's talk left on tape, which we sent to Syd. When Harald get back from Germany we will try to get it all back on tape or have him prepare a flyer for later publication.)

E.L. Sandburg
3000 Waltham Way
Modesto, CA 95350
Nov 28, '89

Dear Bob:

Enclosed is a check for \$30 for back issues of TWITT. I can use the gear door covers for the HP-18 if you still have them.

In the news letter TWITT you have

mentioned H.Q. airfoils a couple of times. The H & Q stands for Horstmann and Quast. The Ventus DG-300 and other new sailplanes use these new German airfoils. They are protected airfoils so the coordinates are not published. The rights to use have to be purchased from the DFVLR in Braunschweig, Germany. The profiles were tested in the Stuttgart laminar wind tunnel. A paper on one of them (HQ 19/13.98) can be found in the *Proceedings of the Fourth International Symposium on the Science and Technology of Low Speed and Motorless Flight*, February 1984, and *Papers Presented at the Soaring Society of America Convention Hartford, March 1984*. It is available from the SSA.

The usual,

Gene

Trieste 28-11-89

Gentlemen:

I am a model builder particularly interested in the construction of flying wings and tailless aircraft. I have read about your organization in the *R/C Soaring Digest*, as in Italy it is almost impossible finding books or magazines concerning the theory of this kind of aircraft. I would like to become a member of your organization and receive the newsletter.

Please specify the subscription rate considering that I would receive the newsletter via air mail.

Thanks and regards

Alessio Bacer
Via Pendice Scoslietto No. 5/4
34127 TRIESTE ITALY

(Ed.-For others who may read this, for-ign subscriptions are \$19 payable in U.S. currency. This higher rate covers the postage for overseas members.)

Stuttgart, Nov 5 '89

TWITT

Dear Peter:

Dear Bob: See pictures on page 5.

Four weeks ago we had the 7th Symposium on *Flying Wings* in Germany. As with the one two years ago, I think there would be interest in the TWITT community to know a little bit of what happened here. It's a pity that I couldn't add any drawings or sketches, but better verbal information than nothing, I thought.

In the latest Bungee Cord I read that you are one of the owners of the "Screamin Weiner," one of the oldest sailplanes in the United States. Also they told that you own a TG-4A, too. (Ed. - Its really a TG-2) I am very interested in material on those old sailplanes, especially good color slides, details and the whole machine on the ground and in the air. I am collecting those materials of all sailplanes from WW II and former times, still existing airworthy, to prepare a book with them from all over the world. Would you be so kind to help me? Let me know how we could exchange those materials, etc. With great interest I also saw your photographs of the Swiss "Diamants," too. Could you send me copy of slides or prints, please?

With best regards and in hope to have one day the chance to participate in TWITT meeting.

Peter (F. Selinger)
Landschreiberstr. 21
D-7000 Stuttgart-75
Federal Republic of Germany

(Ed.-See the minutes of the symposium elsewhere in this newsletter.)

January Guest Speaker

Subject: The Sceptre ARV. Design, development and history.

Speaker: Craig Roberts; Aircraft Design Engineer, 30 yrs. of age. 12 yrs. experience in engineering. Model aircraft builder and pilot since 2½ yrs. of age. Hang Glider pilot since 1978. Notable private projects include:

- 1) a vortex-lift aircraft recovery system patented by my father, Lacey Roberts.
- 2) the Aquila self-launch flying wing sailplane.
- 3) Sceptre ARV composite lightplane.

(Ed. - The following article was sent to us by Peter F. Selinger and is presented in his words with only minor editorial changes. If you have any questions we suggest you correspond directly with Peter and let TWITT in on the results. Thanks, Peter, for a most interesting look at the European flying wing philosophy.)

7th Symposium on Flying Wings from the German EAA, the Oskar-Ursinus-Vereinigung in Scheidegg/Allgau on October 7 & 8, 1989

TWITTs Discuss TWITT

Walter Stoppel, organizer and mentor, could welcome more than 100 participants to the 7th meeting for Germany's enthusiasts of flying wings. But this year he had a record with additional guests from Austria, France, Italy, Netherlands, Switzerland and Yugoslavia. He presented the following lectures to the audience.

MODELS: Dr. Michael Wohlfahrt - a "scientific son" of Professor Dr. Karl Nickel - and his colleagues from the Swiss logo-team told of recent test flights between normal F3B models and flying wing F3Bs. There is a real chance now for a swept flying wing with winglets in a competition. But the designer has to be careful, especially in stall characteristics and maneuverability. To get this aim he has to use a constant airfoil and chord for the whole wing, to shrink from the root, to take a low aspect ratio and sweeping angle, and to fly with a large stability (cg). A W-form (about +/- 5 degrees) for the wing will decrease the slide-roll-moment. The air-brakes should be realized by bringing the rudder angles one up, the other down, etc., so you will get so big effects that the model could be flown vertically downwards without the risk to exceed the maximum speed. With a video they demonstrated the results earned by their own model.

EFFECTS: Professor Dr. Karl Nickel (he worked for the Horten brothers during WW II) gave his attention to the special effects, flying wing sailplanes have to fight against

the people's opinion:

* Fluttering, all aircraft have to bear, and each constructor has to carefully design stiffness into his plane whether it has a tail or not.

* Rudder-inversion is an avoidable problem, existing only for flying planks (non-swept flying wings).

* To come out from the trail-eddy of the tow plane is a question of training the pilot. He has to learn procedures to come out simply together with the behaviour of the tow pilot. Safe means to fly above the trail-eddy.

* Boundary layer migration is an effect used in modern sailplanes to improve the performance. It's a good fairy tale to think the flying wing will be "stuck" into its own boundary layer.

* The bell-lift-distribution was a well proven guarantee for good flying characteristics in a time in which the calculation methods were not so highly developed as today. It's a real high merit of Dr. Reimar Horten to detect these coherences 50 years ago. Today we can calculate the disadvantages in performance and equalize with winglet design.

* The so-called middle effect Prof. Nickel discussed more in detail. He proved that this loss of lift in the center section of a sweptwing, tailless aircraft is a result only of the calculation methods and knowledge. At this time, up to more than 30 years ago, it wasn't possible to calculate a sweptwing lift distribution directly. The designer had to work with the plank and then he found less lift in the center of the sweptwing. Now as it is possible to make it better, we have to realize that the results of our predecessors have to be proved with their knowledge, not with today's.

* The ideas from Dr. Friedrich Wenk and Alexander Lippisch to enlarge the wing chord in the aileron area as a compensation of the losses in lift due to the washout of the wing actually have more importance today. They show us again, that they knew more than we may believe today!

RECONSTRUCTION: In Germany only one pair of wings of the four Horten IV sailplanes (built during WW

II) still exist. The middle section with the pilot's compartment and the wing connection points was lost during the years. Also, a lot of drawings of the Horten IV were found, but also incomplete. Edward Uden, Dipl. Physician near Hamburg, took the drawings, photos he could find and measured the wings and now realized with his CAD system new drawings of the center section. The old plans he also put in his computer, because they were very difficult to read. His work now allows him to reconstruct the Horten IV for exhibition purposes. In a second step, he put all the Horten's calculations into his PC. Now he is able to determine the aerodynamic parameters of the Horten IV and of other sweptwinged TWITTs, especially for models.

FLIGHT MEASUREMENTS:

Pressure distribution measurements on airfoils are most common for rigid wings, but very seldom made on flexible wings as hang gliders or foldable ultralights. Now a new era is raising, for Manfred Schneider from Switzerland did exactly this with up to 36 data points on the wing and pitot tube, etc., in real flight, recording the manometers with a 35mm camera. To get airflow information in addition, he took wool tufts, put them on the upper side a little bit longer and on the lower side of the wing shorter to have the chance to differ from each other in looking upwards against the heaven through the slightly transparent clothing of the hang glider. He realized that there must be two or three separation bubble systems lying on the wing's lower side. Near the wingtip the airflow was in wing direction, not in flight direction. Why? There are some ideas, but we still have to wait for more and more detailed information.

FLAIR 30 - FASCINATION:

We all were keen on Professor Gunter Rochelts's report of the flight tests of his FLAIR 30, made by Knut von Hentig, a member of the German National Hang Glider Team. Now it flies well, they said, but they had to do a lot of work in the aileron-elevator-rudder connections and the angles between them. Also, he had to modify the airfoil leading

edge twice to get sufficient results. Stall characteristics now should be good, with the FLAIR only going into a spin by intention and in dynamic stall flight. The performance is not as good as expected, but with about a 25 glide ratio good enough for a "hang glider" - FLAIR is one or not? Now Prof. Rochelt starts the second prototype to be built in negative molds, not in positive as this first was. Also, they had to realize what is well known from the Horten XV in the fifties, that the canopy influences very definitely the airflow in the center section, and therefore, the characteristics and the performance. Again, it is to report from Rochelt's capability to find other people to work for him, he succeeded with FLAIR 30, too, Dr. Michael Wohlfahrt and Hansjorg Ackermann f.i. are to be named firstly.

The next morning of the two day event at the northern border of the European central Alps brought lectures of the progress of *Akaflieg Braunschweig's SB 13* made in the past year.

Akaflieg's first test pilot, Hans-Jurgen Berns, had to go to Great Britain in his professional tasks, so Dirk von Werne had to present the results. The SB 13 flies well, but will not be a K 6! Last summer they made performance tests, too, and found out a rather good "best glide ratio" of more than 42 and a good penetration, in spite of the disadvantage winglets bring at higher speeds.

The minimum sinking speed was proved with 0.57 m/s. A little boundary layer fence on the upper side improved the flight handling characteristics so much, that now the first younger Akaflieg members are allowed to fly the SB 13.

The only remaining problem, for which they still have no solution, is the gusts sensitivity in alpha direction. The other things should be solved within reasonable time and efforts, landing gear, new side rudders in the winglets to save weight, and mass balance.

Oliver Seack presented the highly sophisticated control mechanism of the SB 13, which had to be made three times until they were ready to fly with. All rudder parts, 8 in all, are superimposed in very complicated angle functions,

aileron versus side rudder and elevator, etc. Also, the safety system with a three canopy cross band parachute found great interest. With a video they showed us how the SB 13 spins - terrible enough to look on, but far more to fly, greatest honour to Hans-Jurgen Berns to make these tests so consequent and completely documented.

Recently I heard that the SB 13 perhaps will be exhibited in Washington in May 1990?!
 CONGRATULATIONS!

Hans Zacher, mentor and "father" of the German Akaflieds (himself having flown the famous Horten IV during WW II) had the honour and pleasure to tell us witty and serious, warning and admonising, enlightening and remembering, rhymed and epic words, sentences, quotations and references a summary, an appreciation and valuation of the history of the flying wing development. His lecture was the well done finish of the 7th German Flying Wing Symposium. The next will be held in 1990 or 91, again in the South of Germany.



Screamin Weiner N14287
 1988 Santa Ynez, CA



Hernan Posnansky
 one of the original group
 from Switzerland. The
 P in PF-1. N15 PF.



The Screamin Weiner N14287
 aka Lil Dogie N44W.



This is not our TG-2
 but is a great restoration.



LK N53619 at SHA
 gathering at Tehachapi, CA
 1989.

AVAILABLE PLANS

To: Bob Fronius
 c/o TWITT
 Box 20430
 El Cajon, CA 92021

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

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

From: PRECISION CORES
 850 Concord St.
 Pleasanton, CA 94566
 (415) 462-0672

Dear Sirs:

I have been following your various letters, etc., regarding flying wings. I too am caught up in the mystique of the flying wing. I have a "Raven" which just manages to fly; however, I plan to get back to "Wings" when the time and plans permit.

There was a point of interest in your letter published in the December issue of Soaring Digest. In this letter you referred to parts for a "Baby Bowlus Albatross." I have been wanting to build a RC scale glider of the "Baby Bowlus" and the "Super Bowlus" but have been unable to find any drawings of the gliders.

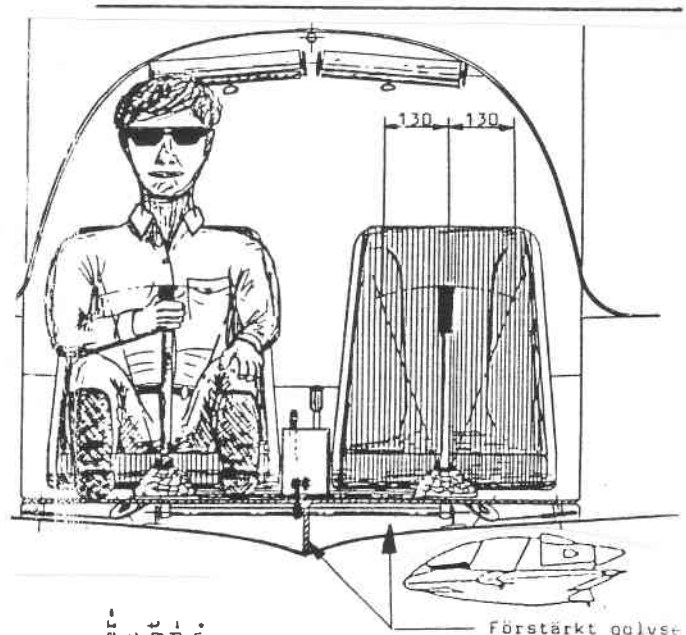
If you have any sketches or know of a source, I would appreciate the information.

In addition I would appreciate any information on plans for the RC "Wing."

Thank you, and good lift without a tail.

Dave Acker

(Ed. - For Dave and those other of you who may be interested plans for a scale Bowlus should contact Model Builder Magazine, 898 W. 16th St., Newport Beach, CA 92663-2802. Ask for the article by Col. Bob Thacker from the Sept. '75, Vol 5, #45 issue which covers his scale effort. You can also inquire about availability of scale plans, #9751-B (2 sheets), for the Baby Bowlus. I have also been informed that Col. Thacker's model is hanging in one of the San Marcos, CA hobby shops. Sorry, but we do not have any information on the "Wing." Good luck in your search and let us know what you find.)



Säkerhet

Golvsektionen är både utformad och förstärkt för att klara en eventuell buklandning. Kroppen är uppbyggd kring en stålörarsram som upptar lasterna från motorn. Denna utövr också ett visst skydd vid ett haveri. För övrigt är flygplanet utrustat med ELI, brandsläckare och givetvis säkerhetsbälten.

Komfort

Stolarna är skjutbara i längsriktning ± 100 mm samt i höjled ± 50 mm. Siktinkeln framåt är för en pilot med standardlängd 13°. I sidled blir sikten god tack vare vingens utpräglade pilform. Kabinbredden är ofullständig för diskussion. Man får här väga luftmotstånd mot komfort. En kabinbredd på 1100 mm lott vara optimalt. Solgardiner finns i drags fram vid besvärande solsken. Instrumentpanelen skyddas mot solljus och reflexer av en omslutande skärm. Bakom stolarna finns även plats för ett mindre bagage.

Try translating this.

Service

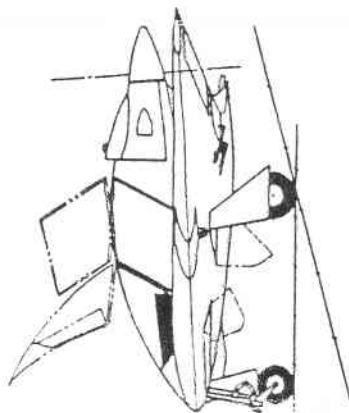
Under framre apparatrumslucken är batteriet, hydraultänk och pump placerade. Även avionik och instrument är här lätt åtkomliga bakifrån.

FLYING V HP1

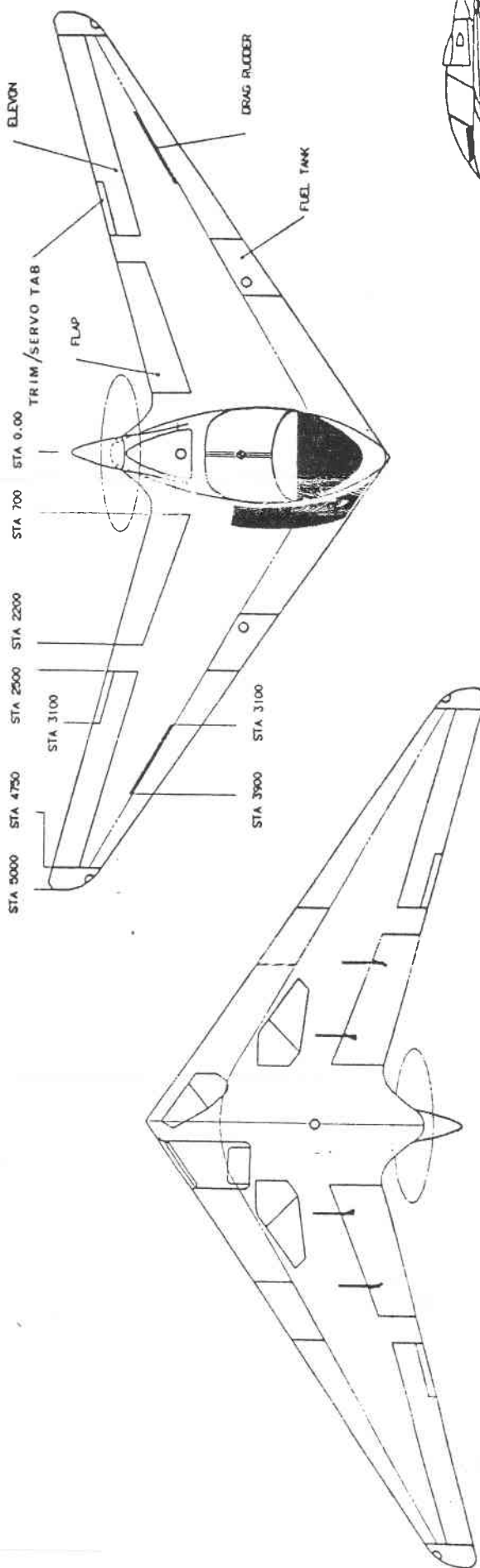
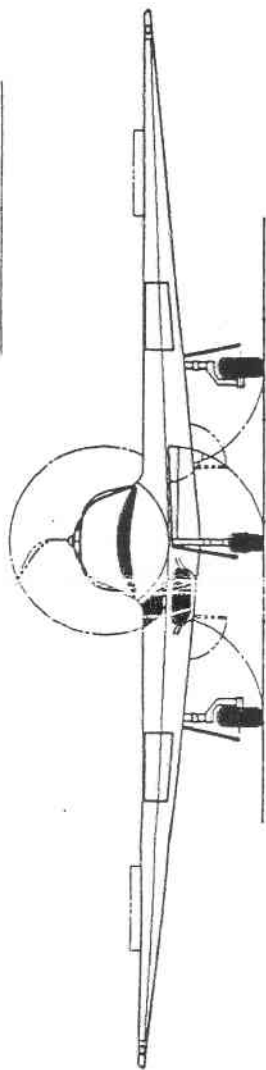
In- och urstigning

Besättningen kliver upp på höger vinghaiva i nos. Ett fötsteg är placerat i anknytnings till nosstället och falls även in med detta. Kring nospartiet finns också fjäderbelastade luckplåtar, vilka men med händer och fötter trycker in. Dessa utgör då handtag respektive fötsteg. Intill högra kroppsektionen är vingens förstärkt med något grovre plåt och belagd med halktejp. Kabinövre är av typ mövning och är väl tilltagen med tanke på in- och urstigning.

FLYING V HP1



TYPRITNING



FLYING V HP1

"ROCK SPRING"

SKALA 1:50

SPECIFICATIONS FOR HP1

GENERAL

Configuration: Flying wing, 2-place,
single engine, club
airplane with retract-
able landing gear.

Designed to meet FAR 23 Utility
Category

ENGINE

Make: Norton Motors, Ltd.
Type: Aerotor Model P64
Power: 90 hp

PROPELLER

Make: McCauley
Type: SC 7165
Diameter: 71"
Pitch: 65"

FUEL

Type: 100LL, 92 Octane min
Capacity: 2 * 57.5 liters = 115 liters

OIL

Type: Castrol A545 (Synthetic)
Capacity: 3 liters

COOLANT: 12 liters

BATTERY

Make: Gill
Type: G-35
Capacity: 23 Amp Hours

LANDING GEAR

Gear: 5 x 6 inches
Nose gear distance: 1.75 m
Wheelbase: 3.25 m

AERODYNAMIC/GEOMETRIC DATA

Airfoil: NACA 747A315
Wing Span: 10 m
Wing Area: 15 sq m
Aspect Ratio: 6.66
Taper Ratio: 1/5.7
Dihedral: 5 degrees

Washout: 10.5 degrees
Sweepback: 30 deg @ 25% chord
Wing Loading: 41.3 kg/sq m
Elevon Area: 1 sq m per side

Aileron Deflection: \pm 10 degrees
Elevator Deflection: \pm 15 degrees

Trim Tab Area: .06 sq m per side
Trim Tab Deflection: \pm 15 degrees
Flap Area: 1.65 sq m
Flap Deflection: max 40 degrees
Spoiler Area: .2 sq m per side

BAGGAGE

Volume: 300 liters
Size: 35 x 78 x 110 cm
Max Load: 40 kg

DOORS

Cabin: 70 x 80 cm
Instrument Compartment: 80 x 100 cm

WEIGHTS

Empty Weight: 360 kg
Useful Load: 260 kg
Gross Weight: 620 kg

PERFORMANCE

Max Speed: 167 kts (300 km/hr)
Maneuver Speed: 100 kts (180 km/hr)
Cruise Speed: 134 kts (240 km/hr)
Minimum Speed: 45 kts (80 km/hr)
Landing Speed: 45 kts (80 km/hr)
Stall Speed (clean): 47 kts (85 km/hr)
Stall Spd (40 flaps): 38 kts (68 km/hr)

Takeoff Distance Over 50' Obstacle:
465 m on hard surface
500 m on gras
Landing Distance (roll distance): 100 m

Best L/D: 19 @ 90 kts
Best Climb Rate (@ gross): 1050 ft/min
Least Sink Rate (@ gross): 360 ft/min

Max Range: 615 Nautical Miles

ARTICLE 7. EXECUTION OF INSTRUMENTS, DEPOSITS AND FUNDS

SECTION 1. EXECUTION OF INSTRUMENTS

The Board, except as otherwise provided in these Bylaws, may by resolution authorize any officer or agent of the corporation to enter into any contract or execute and deliver any instrument in the name of and on behalf of the corporation, and such authority may be general or confined to specific instances. Unless so authorized, no officer, agent or employee shall have any power or authority to bind the corporation by any contract or engagement or to pledge its credit or to render it liable monetarily for any purpose or in any manner.

SECTION 2. CHECKS AND NOTES

Except as otherwise specifically determined by resolution of the Board, or as otherwise required by law, checks, drafts, promissory notes, orders for the payment of money, and other evidence of indebtedness of the corporation shall be signed by the Treasurer.

SECTION 3. DEPOSITS

All funds of the corporation shall be deposited from time to time to the credit of the corporation in such banks, or other depositories as the Board may select.

SECTION 4. GIFTS

The Board may accept on behalf of the corporation any contribution, gift, bequest or devise for the charitable or public purposes of this corporation.

ARTICLE 8. FISCAL YEAR

SECTION 1. FISCAL YEAR OF THE CORPORATION

The fiscal year of the corporation shall begin on the first day of January and end on the last day of December in each year.

ARTICLE 9. BYLAWS

SECTION 1. AMENDMENT

Subject to any provisions of law applicable to the amendment of Bylaws of public benefit nonprofit corporations, these Bylaws, or any of them, may be altered, amended, or repealed and new Bylaws adopted by approval of the members of this corporation.

SECTION 9. DUTIES OF TREASURER

Subject to the provisions of these Bylaws relating to the "Execution of Instruments, Deposits and Funds," the Treasurer shall:

Have charge and custody of, and be responsible for, all funds of the corporation, and deposit all such funds in the name of corporation in such banks and other depositories as shall be selected by the Board.

Receive, and give receipt for, monies due and payable to the corporation from any source.

Disburse, or cause to be disbursed, the funds of the corporation as may be directed by the Board, taking proper vouchers for such disbursements.

Keep and maintain adequate and correct accounts of the corporation's properties and business transactions, including accounts of its assets, liabilities, receipts, disbursements, gains and losses.

Prepare, or cause to be prepared, and certify, or caused to be certified, the financial statements to be included in any required reports, and to be submitted at the time a new Board of Directors takes office.

SECTION 10. COMPENSATION

The officers of the corporation shall serve without compensation except that they shall be allowed and paid their actual and necessary expenses incurred in performing their duties as prescribed by the Board.



FLYING V HP1

INSTRUMENTPANEL

