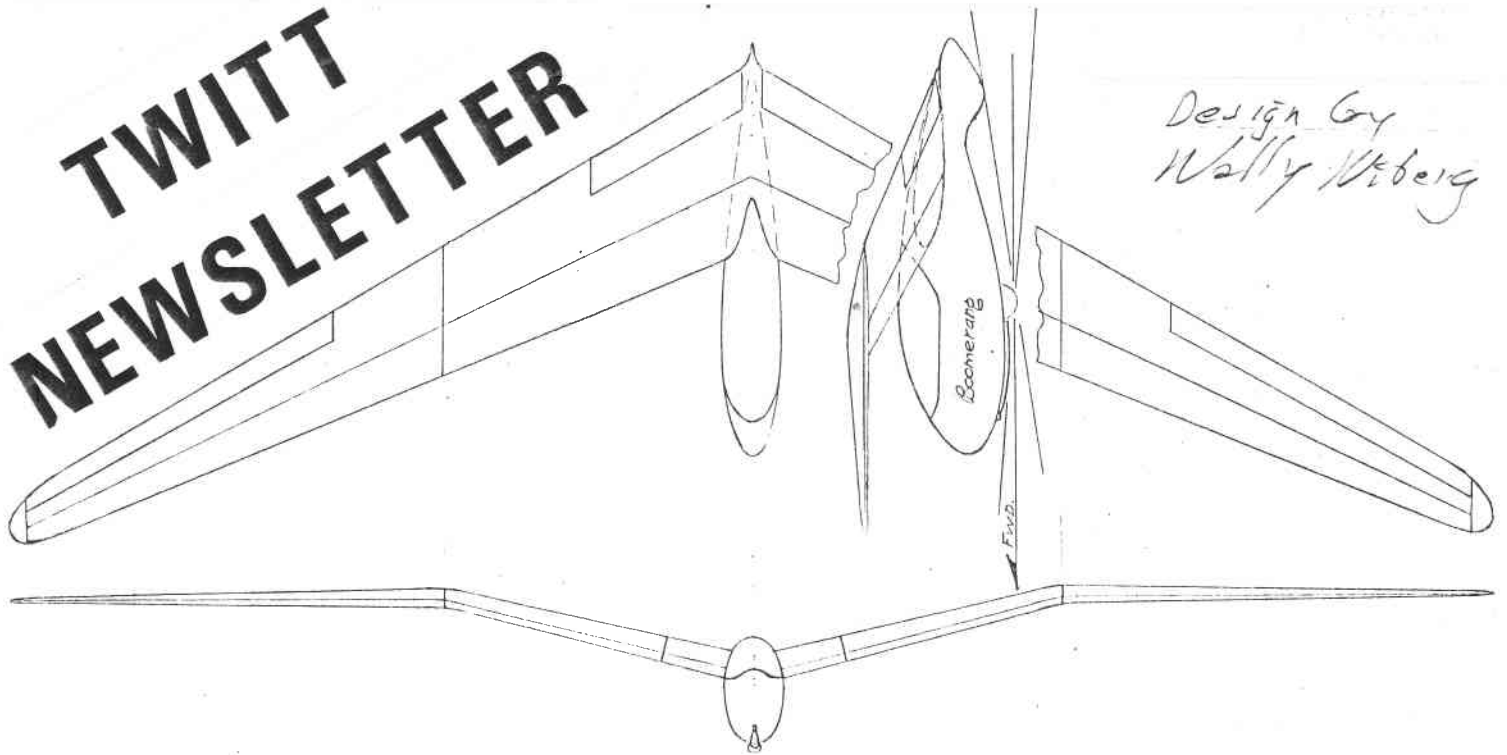


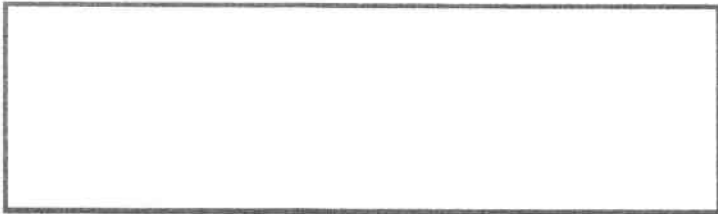
TWITT NEWSLETTER



*Design by
Wally Weberg*

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TWITT
(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., 9000 means this is your last issue unless renewed.

Subscription rates are \$15 per year for U.S. mailings and \$19 per year for foreign mailings due to higher postage rates.

Next TWITT meeting: Saturday, August 18, 1990 beginning at 1330 hrs at hanger A-4, Gillespie Field, El Cajon, Calif. (First hanger row on Joe Crosson Dr.)

PRESIDENT'S CORNER

Just a short column this month since I have been on vacation and out of touch. As you see from the meeting's minutes we were unable to have elections in July so I am still holding down this illustrious position. The August or September meetings should give us an opportunity for a representative election.

I would like to thank all of you who are sending in bits and pieces of information on flying wings of all kinds. As you will notice in the Letters column, Kevin Renshaw is becoming a regular contributor and it is very much appreciated.

I hope you enjoyed the Russian flying wings in last month's issue. It looks like we have some more interesting items from the German side of the continent which we will try to get into the newsletter in the near future either in whole or as filler.

Just for your information, TWITT membership is now up to 115 flying wing nuts. This is slightly higher than last month, with some of the new members coming from areas of the country we hadn't heard from before. This is encouraging, since it appears the work about TWITT is spreading through your efforts. Thanks to all of you who continue to support TWITT.

I said it would be short, so that's it for this month. Happy flying in the summer thermals.

Andy

AUGUST PROGRAM

This month's program will be devoted to the Rotax power plant. Lee Klaus and Roger Allen, who both have been flying Rotax powered aircraft, will share their good and bad experiences with the group. They will have their current aircraft, an 8/10 scale L-2 with a Rotax 447 (fan cooled) and Lee's new project, a Pulsar, powered by a Rotax 582 (liquid cooled), on display. Ed Fitzgibbons will bring his recently completed Mini Max, powered by a Rotax 337 (air cooled), so we will have three sizes of the Rotax engine to examine and be able to talk to people who have operated them. (Some current literature and up-to-date performance curves have been promised to us by Kodiak Research, the Canadian importer of Rotax, but we may have to wait until after

Oshkosh.)

TWITT member Fortunato Figueroa will also discuss "The Aerodynamics of Engine Pod Installations". Tuto offers the following about his part of the program.

In the past I had the opportunity of presenting to you some of the problems that the Internal Aerodynamicist has to face when dealing with the installation of jet engines in subsonic airplanes and how he may be able to solve them. In my next presentation I intend to discuss another aspect of the same type of installation, this time related to the external external aerodynamics and its influence in the overall performance of the aircraft. The subject, like many others related to propulsion systems, requires the combined knowledge of internal and external aerodynamics. Since it does not belong to either field in particular, it is usually neglected by both. The presentation will include a general approach to the estimation and optimization of cowl and inlet lip shapes, determination of form and spillage drags, fuselage and wing interference effects, etc.

This should prove to be an interesting program on power plants and their installation. We will also try to have an election of officers if there are enough members present to make up a majority of a quorum as allowed under the Bylaws.

INFORMATION WANTED

In the May issue (#47) Alan Lewis in Australia mentioned Fauvel's AV-10 design and some material he had included in his letter. Al Backstrom in Texas gave Bob a call asking for any information we had on the AV-10. A search of the files proved fruitless, so it appears we have either lost the items or they were filed under some other title and will be found later. We would appreciate anyone who has information about Fauvel designs, and particularly the AV-10, to please send us copies and/or correspond directly with Al Backstrom. His address is: 1220 Yacht Club Drive, Little Elm, TX 75068.

For Al the following information was extracted from Winged Wonders - The Story of the Flying Wings by E.T. Wooldridge, published for the National Air and Space Museum by the Smithsonian Institution Press, Washington, D.C., 1985, p 35.

"Fauvel produced a number of powered and unpowered models during the 1930s, with varying degrees of success. The A.V.2 was a powered glider that enjoyed limited success in 1933. The engine was detachable and the wheels could be replaced by a skid for test flights of that configuration. The unpowered A.V.3 was tested during the summer of 1933, and demonstrated excellent flying qualities. The A.V.10 of 1934-1935 was the most successful in many respects, having been exhibited at the Paris Aero Salon and subsequently receiving the first certificate of airworthiness ever awarded to a tailless aircraft in France. The two-passenger airplane was powered by a 75-hp Pobjoy engine which, in June 1936, carried the unique aircraft to an altitude of 23,500 feet.

(Ed. Note: We apologize to Alan Lewis for misplacing the material he so graciously sent us. It is probably somewhere in the stacks of paper that make up the TWITT library and will be found once the library is better organized and cataloged. We would appreciate it if Alan could send duplicates directly to Al Backstrom, along with any other personal recall he may have on this Fauvel model.)

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

WANTED

MITCHELL WING or other powered glider or truly soarable ultra-light, preferable with trailer.

Have cash or will trade for high performance (L/D 34:1) sailplane with enclosed trailer, oxygen, and instruments

Call Chuck at (619) 447-2519 (San Diego)

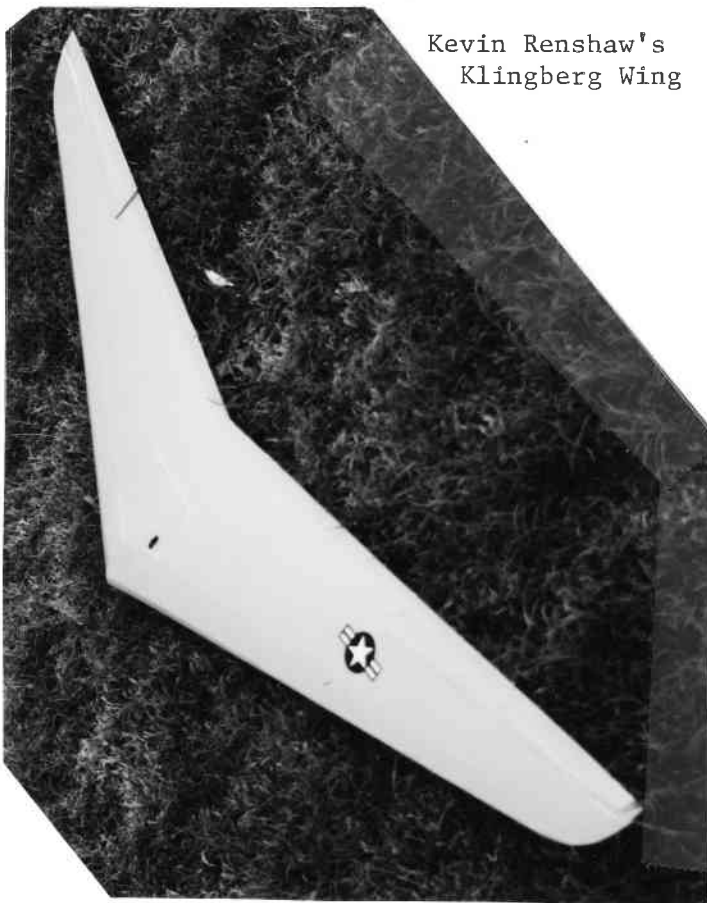
The following was found in the Los Angeles Times newspaper on about May 4th or 5th. Hopefully someone from TWITT will be able to provide some help.

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

COVER

Found in the Wally Wiberg flies at the San Diego Aerospace Museum.

Span 48' OAL 16' OAH 5'6"
Area 169 sq' AvChd 3.25' AR 14.8
Empty 250# Gross 420# Loading 2.5#/sq'



Kevin Renshaw's
Klingberg Wing

MINUTES OF THE
JULY 21, 1990 MEETING

Andy opened the meeting announcing some anniversary items: thirteen years ago George Worthington flew a hang glider (Mitchell Wing) to a new world's distance record of 95.4 miles; and fifty-eight years ago Wiley Post became the first person to fly solo around the world using the Winnie Mae. The raffle prizes were announced as two hats donated by Aero Tech Aircraft and Pilot Supplies of Gillespie Field.

The election of officers was postponed again due to the low turnout. The Bylaws do allow for conducting business with a majority of a quorum if the type of business requiring a vote is announced to the membership prior to the meeting. Therefore, we will continue to announce the possibility of elections in each newsletter until such time as we have a quorum majority present. The Board will also consider a change to the Bylaws moving the elections to a month when there is normally a large turnout.

Andy introduced Budd Love, Airlove, Inc., and asked him to give a brief presentation on some of the new ideas he has come up with on his HIAM theory for creating high lift wings. Budd had a small cut-away mockup of one section of a wing to demonstrate how the use of internal flow can produce not only high lift coefficients, between 10 & 12, but also provide a means of primary propulsion.

HIAM uses high temperature, high pressure air flow through a series of jet pumps to create an internal flow that will provide sufficient sucking to maintain the boundary layer while blowing a fowler flap. This will allow a typical transport aircraft to takeoff in approximately 500'. Budd feels this will be necessary in future aircraft since they will be operating out of short inner-city airports.

Budd's previous concept required the normal engines for propulsion, and another engine driving a compressor which would provide the low volume, high pressure air to power the hypersonic jet pumps. He is now considering eliminating the propulsion engines, and instead having them power the compressors, with some residual thrust from the exhaust nozzle. These compressors would be linked to the engine through a direct drive system, eliminating the need for a complex gearbox. The aircraft would then be propelled by the high volume of air exhausting from the lift diffusers. Apparently

this is also partially the result of the high lift coefficients.

Questions from the audience covered the problem of having high temperature air running along the wing leading edge and near fuel tanks. Mark de Piolenc pointed out that you don't want to cool the air since that would cause a loss of energy needed at the jet pump. Obviously, insulation would be necessary in many areas but it doesn't appear to be an insurmountable problem.

Mark asked the question about whether Budd had considered or performed any calculations on the relationship between the initial high levels of induced drag and the peak thrust requirements to achieve liftoff. Phillip Burgers brought up the point that this could be controlled through increasing the wing area, which would require less thrust to produce the required lift. There was a short discussion about creating spanwise flow to increase the virtual wing area, which would be another way of reducing the induced drag and power requirements.

Budd is trying to interest venture capitalists in his project, but as yet has had no luck in finding the necessary funding. He needs this in order to build a full scale prototype of one section to prove the theory. Phillip suggested using a smaller model in a fluid dynamic environment (Budd's swimming pool) and video taping the flow using a small amount of dye. A high pressure water hose would substitute for the compressed air.

Andy then introduced Marvin Crane, the builder and pilot for the Mitchell A-10 wing sitting at the entrance to the hanger. Everyone gathered around the aircraft (which was in a cooler part of the hanger) and listened to Marvin tell of his building and flying experience with this aircraft.

Marvin's is the original version of the Mitchell series of rigid wing hang gliders. The hang glider wasn't as successful as it could have been due to the high landing speeds, about 20 MPH, which required a quick runner. Various combinations of wheels were tried, but without much success.

As engines were added to the hang gliders, Mitchell was asked to analyze the wing and see what he could come up with in a powered version. He redesigned the spars, somewhat, making them stiffer and then added a cage suspended from the four attach points already in the wing. He added a 125cc, 12 hp McCullough engine which gave it a takeoff distance of about 150' and 300 fpm rate of

climb. It stalled around 23 mph with a top speed of about 60 mph. The span is 34' with an aspect ratio of 8 to 1, and a max L/D at about 36 mph. It has been statically tested to 1250 pounds and he knows of no instance where there has been a structural failure. The wing uses a NACA 23015 airfoil.

After obtaining a set of plans he gathered together all the necessary materials and had no problems following the instructions. Construction is entirely of spruce, plywood, and styrofoam, with no support cables anywhere in the structure, and primarily uses epoxy to hold everything together. Marvin indicated it was like putting together a large model airplane and did not require being an expert builder.

Of course new owners wanted more power and speed so the Zenona engine was chosen to replace the original McCullough. The new engine had 22 hp at about 6300 rpm. The whole engine package weighs in at about 48 pounds, which is somewhat lighter than the Rotax engines some builders are now using. Marvin also added a few other small items he wanted to the aircraft and engine system, coming up with a final weight of about 228 pounds compared to the design weight of 225 pounds.

Performance with the 22 hp engine appears to be quite good. On his second flight he got airborne in about 50' and had no trouble climbing quickly to pattern altitude, estimating his climb rate at about 700 fpm. His pellet type airspeed indicator quickly pegged out at 55 MPH so he had to throttle back below three quarters power to get the speed back below 55.

He indicated that the aircraft is very active once in the air. It doesn't take much control movement to perform maneuvers. Although it appeared to be very pitch sensitive, Marvin found one trip around the pattern was sufficient to determine the required control inputs. Once he found this point he said it flew similar to a Cessna 150 in terms of stability and maneuverability. He hasn't progressed in his testing to the point of trying a hands-off mode, but feels it will remain stable.

The aircraft is flown using the drag rudders placed at each tip. The outboard panels of the wings have 6 degrees of dihedral and the rudders are placed perpendicular to the wing's surface. When a tip's rudder is deflected it not only causes that tip to slow down but also increases drag creating a coordinated turn. Since the

rudders are individually operated by a foot pedal, they can be activated simultaneously to act as speed brakes should the need arise, however, the resulting pitchup may not be controllable with the current elevator authority.

Control is also accomplished through stabulators which are placed aft of the trailing edge to provide both aileron and elevator functions. The ailerons are primarily used to keep the wings level versus turns. Marvin has put counter balances on these surfaces to prevent possible flutter that has been experienced in some versions of the Mitchell wing.

Marvin discussed the sensitivity of the CG range, which is about 3". The aircraft comes with a flight manual which leads you through a progressive program culminating in flight. Before flying the aircraft it was signed off by Tasso Proppe (a TWITT member) who also offered many important tips when it came to the final balancing.

The first flight was unexpected. He had been doing faster and higher power setting taxi tests when the aircraft abruptly leaped about 30' into the air (this was supposed to be a nosewheel flying taxi run). Once in the air he just applied full power and climbed to pattern altitude. When he went to nose over for level flight he found he already had full forward stick, apparently due to an aft CG. He was able to control the pitch through the throttle, and by moving fore and aft in the cockpit just like when the plane was a hang glider. He has now established the acceptable locations for weight and can determine where to put a pilot by placing a scale under the nosewheel.

The aircraft cost him about \$3025 and took approximately 1000 hours of building time. He enjoyed the project and has had fun flying it.

After a short break for refreshments and selling raffle tickets, the group gathered for the drawing. Winners of the Aero Tech hats were Budd Love and Andy. Just so there was no question of fairness the tickets were drawn by Tamara Bergum, who also brought along our youngest TWITT, Duane Bergum.

Andy then introduced Phillip Burgers, TWITT Secretary, who gave us a recount of his trip to the Edwards AFB Museum's symposium on flying wings held in Los Angeles on May 19th.

Phillip attended a dinner meeting put on by the Flight Test Historical Foundation at the Hyatt Hotel near Los Angeles Inter-

national Airport. The program, called "Just Wings", was meant to bring together a group of prominent people involved in all aspects of the aeronautical world to promote contributions to the Flight Test Center's museum. TWITT sponsored Phillip at this gathering in the hopes he could make some important connections with people who might be interested in the type of project being persued by TWITT. He was given business cards and a stack of handouts designed to give someone a quick overview of TWITT.

Once Phillip arrived it became evident that this was a prestigous group of engineers, aviators and designers, so he had to regroup his thoughts about how to best get TWITT's message across. Due to some luck he ran into Bill Chana who introduced him to people like Mr. Cardenas, flight test pilot for the XB-49 program.

Again, due to luck Phillip was seated next to someone who was able to introduce him to more of the "celebraties" present that night. The first of these was Jeanna Yeager, one of the Voyager pilots. Phillip was able to spend a few minutes with her, and of course gave her one of his cards.

About the time they were finishing the main course, Phillip was on his way to meet Chuck Yeager. Chuck was nice enough to autograph Phillip's program, and in turn Phillip gave him a card while explaining (very, very briefly) TWITT.

Just as dessert was put on their table, Phillip was led over to meet Max Stanley, Northrup flight test pilot on the XB-35 and 49 and the N9M. They had a short talk about wings and then Phillip was able to get his picture taken with Max. Phillip also was able to meet Bob Heinz, test pilot on the new B-2.

Before leaving the festivities, Phillip checked the pile of handouts he had placed on the display table and was pleased to see that most of them had been taken by those present. (Although this sounds encouraging we have yet to hear from anyone identifying themselves with the symposium.)

Phillip mentioned he had several papers and articles on flying wings and unique configurations. These will be added to the TWITT library and their contents published as space permits in the newsletter.

After Phillip concluded his remarks the meeting was adjourned.

=====

The Sailplane Homebuilders Association (SHA) will have their Western Workshop at Fantasy Haven Airport, Tehachapi, California on the weekend of September 1, 2 and 3. (Fantasy Haven is not at the Tehachapi Airport, but several miles south.) They have a full program of hands-on demonstrations during the mornings and lectures by noted speakers during each afternoon.

Pre-registration for SHA & SSA members - \$20
 Registration for SHA & SSA members - \$25
 Cost for Non-Members - \$30

Contact: Howard Burr
 1426 Hillcrest Avenue
 Glendale, CA 91202

The program includes dinners on Sat. & Sun. nights, with Jim Marske the keynote speaker Sunday evening. TWITT members Alex Strojnic and Don Mitchell will be conducting portions of the program. Primary activities begin on Saturday at 8:30 AM and end with the banquet dinner on Sunday evening.

Subjects of presentations include:

Long Wing Laminer Magic, Self Launch
 Sailplane

Light Self Launch Sailplane Design Progress

Sailplane Instrumentation

Self Launch Sailplane Design Considerations

Plug-less, Splash-less Composite
 Construction

S-2 & Solitaire Kit Construction

Along with the homebuilt aircraft there will probably be a number of vintage aircraft on display and conducting flight activities. We are hoping there will be several flying wing type aircraft at this gathering. Come on up, even if for just one day, and see first hand some unusual aircraft and talk with their designers and builders.

=====

LETTERS TO THE EDITOR

TWITT

I want to make sure I give proper credit for the data on Russian tailless designs that appeared in number 49. The drawings and text were from Bill Gunston's book Aircraft of the Soviet Union. The book is available from Zenith Aviation Books in Osceola, WI.

The enclosed photo shows the Kingberg Wing model I've been flying lately. Mine is finished in aluminum color Monokote, and has a few add-on parts (markings and a canopy) to make it look like a YB-49 in flight. It flies nicely, but does show how quick a flying wing is in pitch, and how much adverse yaw elevons can induce.

Good Flying,
Kevin Renshaw
Fort Worth, TX

(Ed. Note: Thanks for the correction on the source of the fine Russian wings. For you model buffs who don't pay close attention to the advertisements, the Future Flight Klingberg Wing (#FTF4000) can be purchased from Omni Models, P.O. Box 1601, Bloomington, IL 61704, for \$39.99 plus \$3 shipping or \$4 COD. Their phone numbers are: 1-800-747-6664, (309) 663-5798, FAX (309) 663-2482.)

TWITT

Enclosed is some data on another rare tailless type, the Cornelius XFG-1 fuel trailer glider. This forward-swept design was meant to be towed behind bombers or transports as a flying fuel tank. The English text is from Fighting Gliders of WWII by James Mrazek. The 3 view (and accompanying text) are from the plans that came with a German vacu-form plastic model kit. The German text is the same as the English. Hope you enjoy it.

Regards,
Kevin Renshaw

(Ed. Note: See the text, picture and 3 view elsewhere in this issue.)

TWITT

The December issue of SHApTalk listed your address and stated that information was available for \$2. I know I wrote to you back then but perhaps I forgot the \$2. In any case here is \$2 for the information and a SASE to let me know if there is a problem.

Sincerely,
Claude De Bogdan
Rt 66 HC Box 264
Yellville, AR 72687

(Ed. Note: If we didn't get it before we got it this time and Bob has taken care of getting the information package to Claude. This could be our first member from Arkansas.)

TWITT

July 23, 1990

I have just received the back issues (from Dec '89) of your newsletter which you sent me.

The June issue was of particular interest because of the article on wing-in-ground-effect. Dr. Alexander Lippisch is mentioned quite often with regard to both tailless wings and wing-in-ground-effect craft. Both types of craft are challenging because of their inherent instability, and difficulty in maneuvering.

I have been working on wing-in-ground-effect vehicles for more than thirty years, doing lots of model testing.

Could you please send me the addresses for Ron Bourn, Bud Feurt, and J.C. Pemberton (Scanivalve Corp.). I would be glad to correspond with anyone else who is interested in designing and building models or prototypes of ground effect vehicles.

Morley S. Smith
129 Sheldon Road
Freeville, NY 13068

(Ed. Note: The following should get Morley started:

Ron Bourn
Consultant
Solar Turbines Inc.
P.O. Box 85376
San Diego, CA 92138-5376
(619) 544-5951

JC Pemberton
 10222 San Diego Mission Road
 P.O. Box 20005
 San Diego, CA 92120
 (619) 283-5851

Leo "Bud" Feurt
 12709 Kaitz Street
 Poway, CA 92064
 (619) 748-7204

Also of value to Morley would be a copy of:
The Aerodynamics of the Unconventional Air
 Vehicles of A. Lippisch by Henry V. Borst,
 available from Henry V. Borst & Assoc., 203
 W. Lancaster Ave., Wayne, PA 19087. (Price
 unknown.) Pages 4-34 to 4-50 specifically
 cover WIG concepts and designs. We hope
 this information will be of use to Morley or
 anyone else interested in this flight
 regime.)

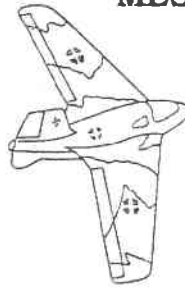
 This little bit of philosophy from Tasso
 Proppe.

If all the cops are English and
 All the cooks are French
 All the mechanics are German and
 Everything is organized by the Swiss,
 This must be HEAVEN.

If all the cops are German and
 All the cooks are English
 All the mechanics are French
 If lovers are Swiss and
 Everything is organized by the Italians,
 That certainly is HELL.

=====

**MESSERSCHMIT
 ME 163
 KOMET
 \$69.95**



A 1/8 scale
 slope soaring
 plane that is a
 ball to fly. The
 kit features a fi-
 berglass fuselage and foam core
 wings that are to be balsa cov-
 ered by the builder. Wings are
 detachable for ease of trans-
 portation. Specs. are 44" wing
 span, 300 sq. in. of wing area,
 and a flying weight of 24 oz.
 The Komet may also be fitted
 with an electric or glow engine
 for flatland flying.

\$5.00 S&H per order
 CA Res. Add 7.25% Tax

**AMERICAN SAILPLANE DESIGNS
 2626 CORONADO AVE., #89
 San Diego, California 92154
 (619) 575-5133**

**CONTEST ENTRY:
 DOPPEL-SCHWAZZ TEUFEL (D-91)
 (Fork-Tail Devil?)**

Kollektion: Baron Max Halb-Darmstadt
 Konstrukteur: Unbekannt
 Aus Darmstadt, Deutschland?

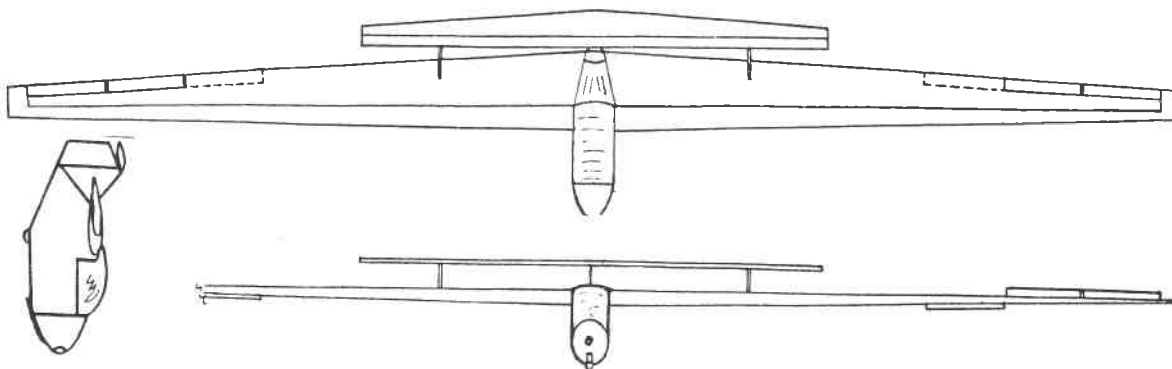
This design is from the old country sent.
 The sender enters the contest because he
 to the SHAP Talk yearly subscribes. The sender
 gained this design by honorable means while
 he at Darmstadt was a student. There he
 learned that Sailcraft which had no tail
 had lightness. There would be less skin
 friction because this design has less soaking
 space. The problem of more Drag caused by
 the reflexed trailing edge was not discussed.
 More so, the negative angle of incidence
 of horizontal tail. An explanation will later
 come.

Beste Gleitzahl: 34.99 : 1

Spannweite 15 meter²
 Flacheninhalt 10 meter²
 Flugelstreckung 22.5

Gewichte
 Hochst 250kg
 Leer 150kg

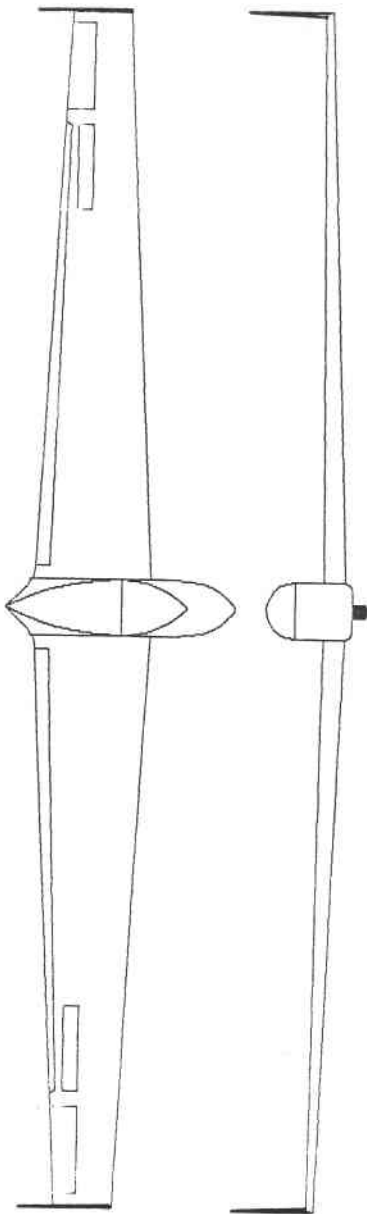
Kein Motor---zum Hoelle Mit. Engine not
 necessary?



WILD THING

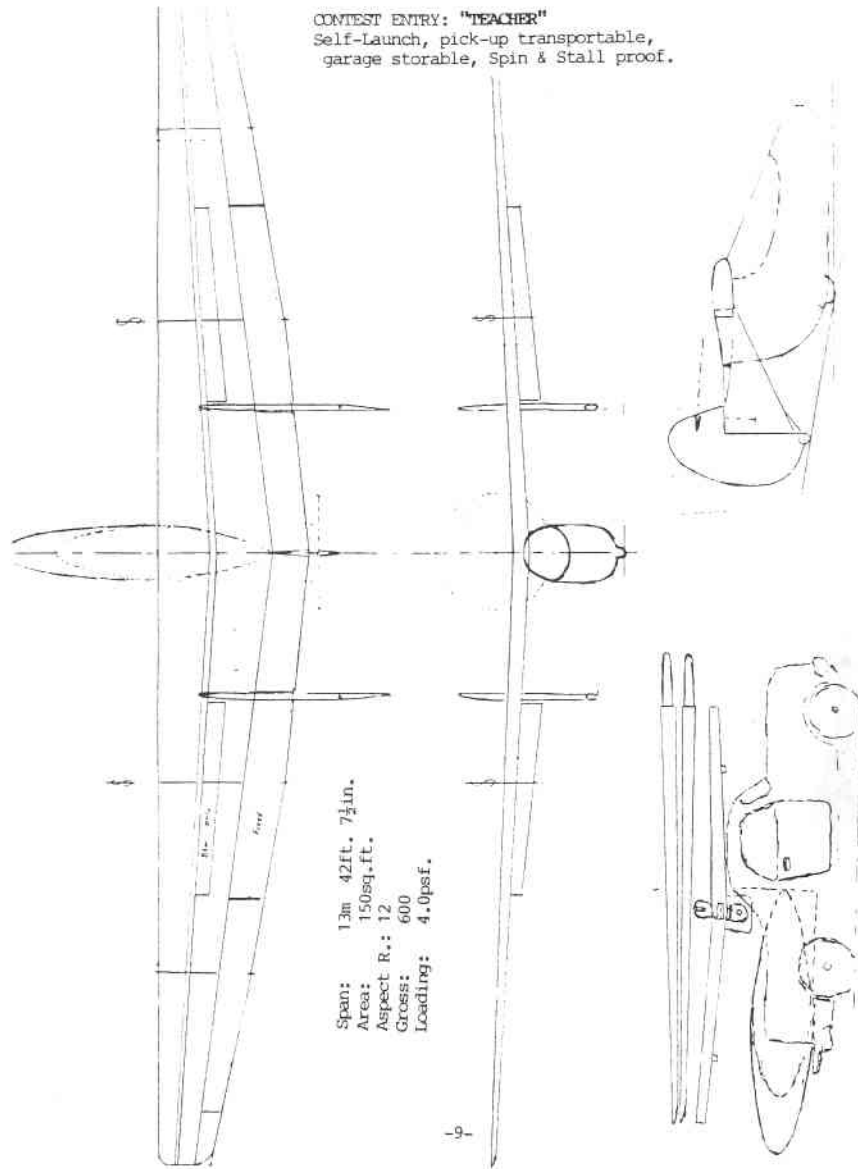
SPAN: 40ft
 AREA: 120sq ft
 MAX GW: 500lbs

GLIDE RATIO:
 MID THIRTIES
 @ 55mph
 SINK: 130fpm
 @ 45mph
 STALL: <40mph



The two aircraft on this page and the Doppel-Schwanz Teufel (D-91) on the proceeding page are from the Sailplane Homebuilders Association contest which will be coming to a conclusion this month.

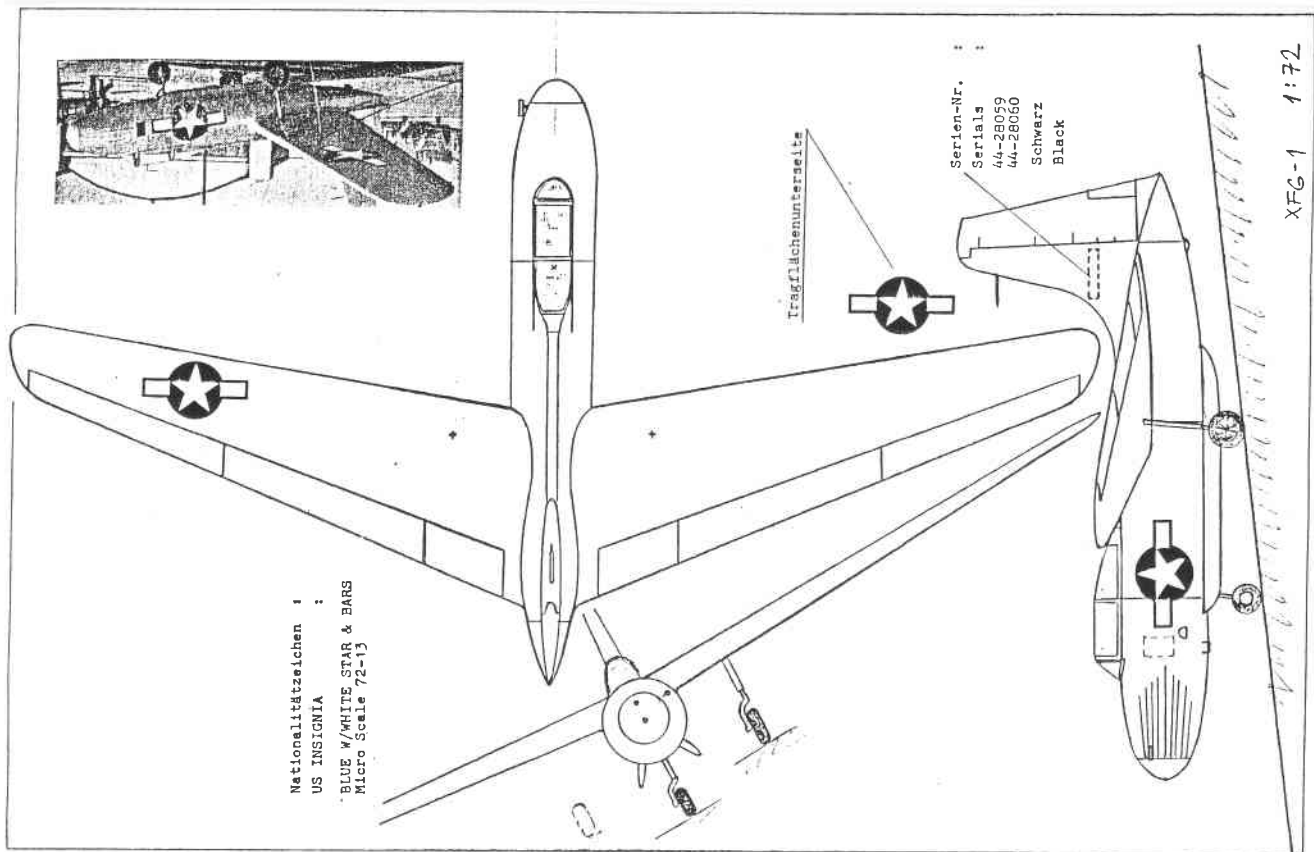
CONTEST ENTRY: "TEACHER"
 Self-Launch, pick-up transportable,
 garage storable, Spin & Stall proof.



Span: 13m 42ft. 7in.
 Area: 150sq.ft.
 Aspect R.: 12
 Gross: 600
 Loading: 4.0psf.

Pod on it's side - Fins, Rudders removed - Motor behind cab.





XFG-1

In October 1943 the AAF wished to test the feasibility of extending the range of cargo and bombardment aircraft through the use of a trailing glider carrying fuel. The Cornelius Aircraft Corporation of Dayton, Ohio developed the glider, which was to test an unusual aerodynamic configuration that might also be used for a fighter plane.

The glider, decidedly non-conventional in design, had forward-swept wings, and no horizontal tail surface as found in conventional airplanes. It carried 764 gallons of fuel and had a total loaded weight of 8,000 pounds. The wings swept forward fifteen degrees at 25 per cent chord line position. The undercarriage could be jettisoned.

Captain Adam J. Stolzenberger took charge of the project of building a quarter-scale, free-flight, radio-controlled model. It was built at Wright Field and taken to the Naval Air Station at Lakehurst, New Jersey, where a Navy blimp lifted it to the desired release altitude. The model was put into a spin and successfully recovered by opening a safety parachute.

Meanwhile, a new test model XFG-1 had been built. The test pilot spun the glider on the first test, recovering successfully by employing what he termed 'a critical sequence and trimming of controls'. On the second test a spin-recovery parachute was used.

The AAF decided that using a spin-recovery parachute with the XFG-1 was the only effective way to recover the glider from a spin. It was never accepted for production.

Technical Data

Glider Model: XFG-1

Type: fuel glider

Crew: pilot

Dimensions

Wing-span: 54ft

Wing area: 336sq ft

Weight

Total with cargo: 8,000lb

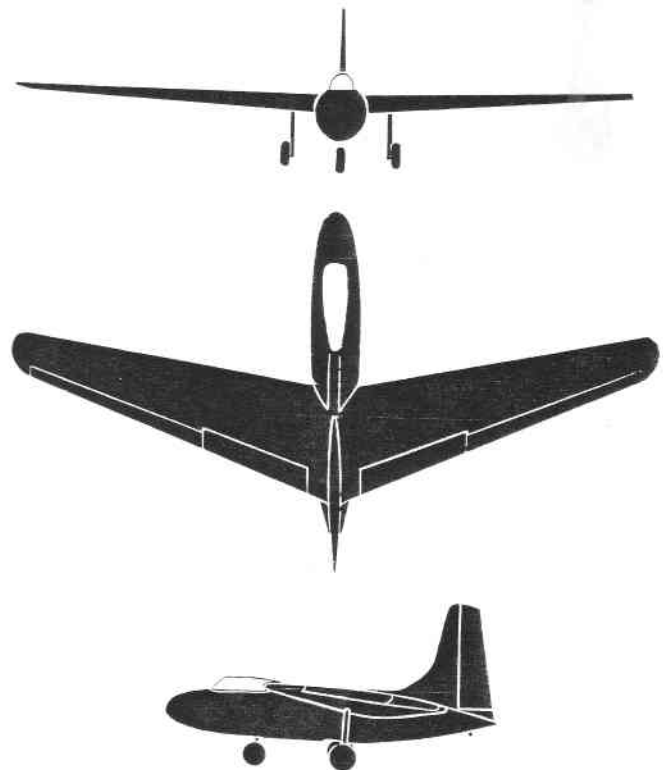
Empty: 3,362lb

Cargo: 4,638lb

Loadings

764 gallons of fuel

The Spartan Aircraft Company of Tulsa, Oklahoma, constructed the glider under a subcontract. Wind tunnel and structural tests were made during the summer of 1944, and on 11 October of that year the XFG-1 made its first flight test. Later that year a Spartan test pilot checking for spin recovery was unable to bring the glider out of a spin and was killed in the ensuing crash.



Cornelius XFG-1 fuel glider, three-view section

SUPER HORNET

By ELIZABETH JOHNSWOOD

This was submitted by Alan Lewis of our Australia section with this comment: This aircraft was displayed at the EAA Fly-in with the Grasshopper. I knew team but missed flying the machine due to rain. Thrust was within 3# of our Grasshopper. Airfoil was a new one. Govt. financed none were sold & a profitable hang-glider company went broke. There appears to be nothing left.

Photo by REG GORDON

No licence needed to fly this zippy little number

IT'S A BIRD! It's a glider! No, it's Super Hornet! Any confusion is excusable when you first set eyes on designer David Betteridge's new plane that buzzes around the sky with the seaquills at Aldinga, South Australia.

It is, in fact, a one-seater, ultra-light plane that becomes a glider at the whim of the pilot.

"In America there's a sprinkling of motorised hang gliders but they're simply standard gliders with a motor tacked on as an afterthought," says David.

"The Hornet, as we've called it, has been designed specifically to fill the gap between powered hang gliders and conventional light planes.

"A pilot can switch off its engine in mid-air, catch the thermal air currents and generally soar around like a glider, then restart the engine for landing."

The Hornet, which is being produced by a Lonsdale, SA, firm, Free Flight Gliders, has caused something of a stir amongst the general public as well as flying buffs.

You don't need a licence to fly the plane if you keep it under 120 metres. It will retail at between \$6000 and \$8000. It needs only around 45 metres to land or take off, it can be assembled or

6 people

dismantled in 20 minutes and packed on a trailer and it's cheap to run — 1¼ gallons of petrol flies you for a full hour.

"We've had floods of enquiries from all over Australia, Europe and America," says Colin Clark, founder-owner-boss of Free Flight Gliders

"An article crept into an American magazine that evidently said the plane was already in production and that brought an extra flood of enquiries. Actually, the Hornet won't be on sale until December — around Christmas time."

'Flying the Hornet is like riding a motorbike in the air'

When I went down to the Lonsdale factory to see what all the fuss was about, I found a couple of latter-day Wright brothers, exuberantly getting on with the job.

Colin Clark is an ex-watchmaker who says he got tired of fiddling in the small world of cogs and turned his hobby of making gliders into a business.

He has been running his very successful Free Flight Gliders factory for five years and has established a good reputation

among sportspeople for his hang gliders and land gliders.

Designer David Betteridge is an aeronautical engineer who graduated from the University of NSW in 1973. His six years with the university included two years research in supersonics and two years in animal flight.

Add another five years he spent

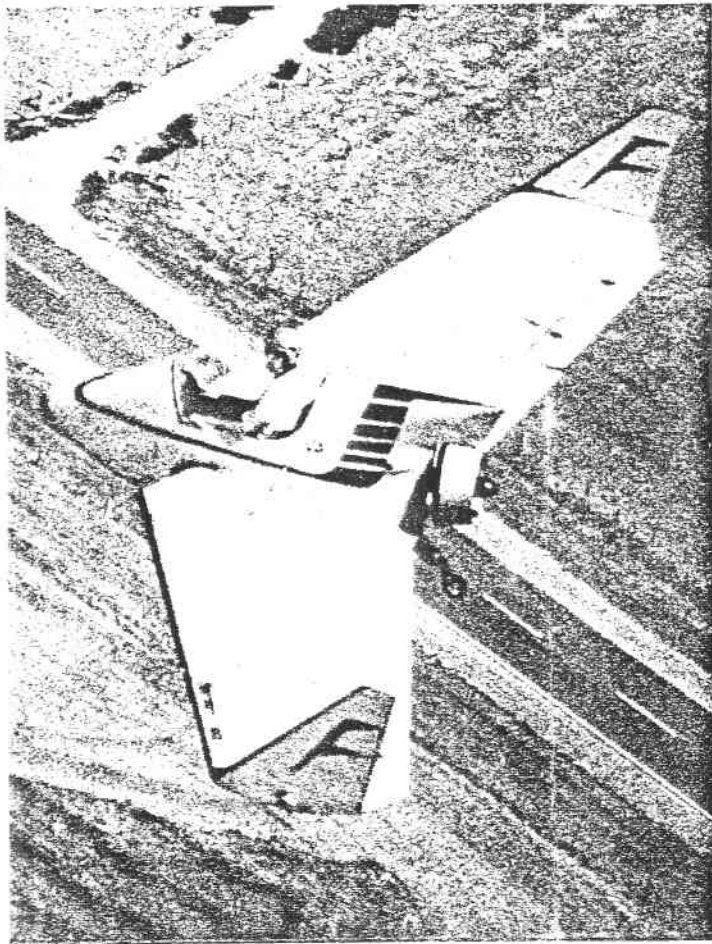
working for Hawker de Havilland, Australia and you have a cluey man in his field.

Colin Scott, test pilot for Free Flight Gliders and the Hornet, backs that.

"There's no way I'd be risking my neck on a slapped up job," he says. "I know David's qualifications and ability. I know the work that's



David Betteridge, designer of the Hornet, with Colin Clark sitting in the half-assembled plane. It goes on the market sometime after Christmas.



gone into the design of the Hornet. I had no worries taking her up.

"Flying the Hornet is like riding a motorbike in the air. It's a wild experience. It is probably the most exciting thing I've ever flown."

That's quite a rave from this ex-RAF, typically understated English flying type who has flown 48 different kinds of aircraft in a 23-year career.

The small plane appears to have this kind of effect on most people. Betteridge and Clark say that when they've taken it to air shows they've had Mirage and F111 pilots enthusing over it.

When they took it to the Schofield Air Show in Sydney in November, 1978, they had to rope it off to stop pilots from schoolboys to old boys, climbing in and making revving noises.

The prototype of the Hornet aircraft is built in aluminium and plywood but those for sale will be made in fibreglass.

They will be powered by a two-stroke, 13.5kW engine, have a wing span of 7.92 metres and wing area of 39.62 sq metres, cruise at 72km/h, have a maximum speed of 112km/h and a stalling speed of 32km/h.

There's an interesting comparison between the Hornet and the first plane the Wright

brothers got off the ground. The Wright Brothers' engine alone weighed 90kg, which is the exact empty weight of the Hornet complete. (Maximum weight with pilot is 180kg).

Some critics have questioned the sense of making the Hornet, but designer David Betteridge says, "They seem to think because we're making a low weight, low speed plane we've gone backwards.

"We think just the opposite. It's a forward step. Here's a plane we've deliberately brought back to the safe speed range anyone can handle. It's the speed of the high-powered ones that kills."

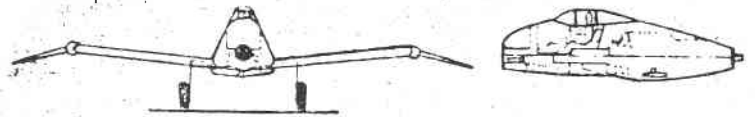
Who will buy the Hornet?

"We expected it to be more a fun plane for sport," Colin Clark says. "We've been pleased to find all kinds of people are interested in it for other things. For instance, station people see it as perfect for boundary riding. We expect to sell 300 in Australia, alone."

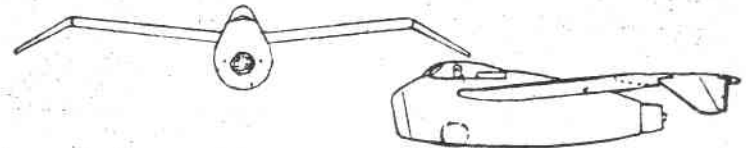
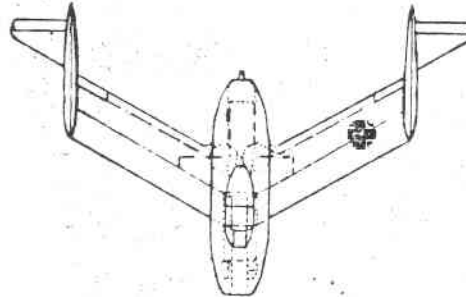
For nervous types who prefer to fly with virtually one foot on the ground, the plane has an 007-type safety feature — an inbuilt parachute that jettisons above if you should need it and floats you and the Hornet gently down to terra firma.

Definitely my kind of plane. ■

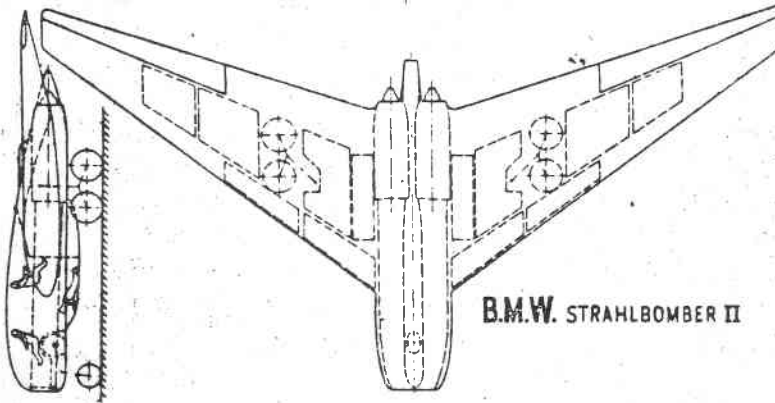
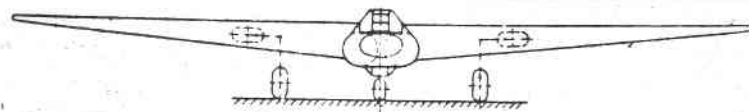
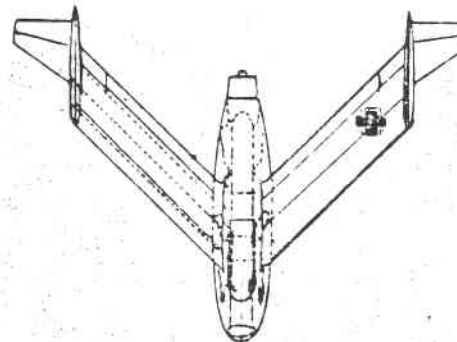
Germany's development of a successful turbo jet resulted in their doing advanced re-research in high speed aircraft. Design studies by Blohm and Voss resulted in the unique proposals shown here.



B&V P210



B&V P212



B.M.W. STRALBOMBER II