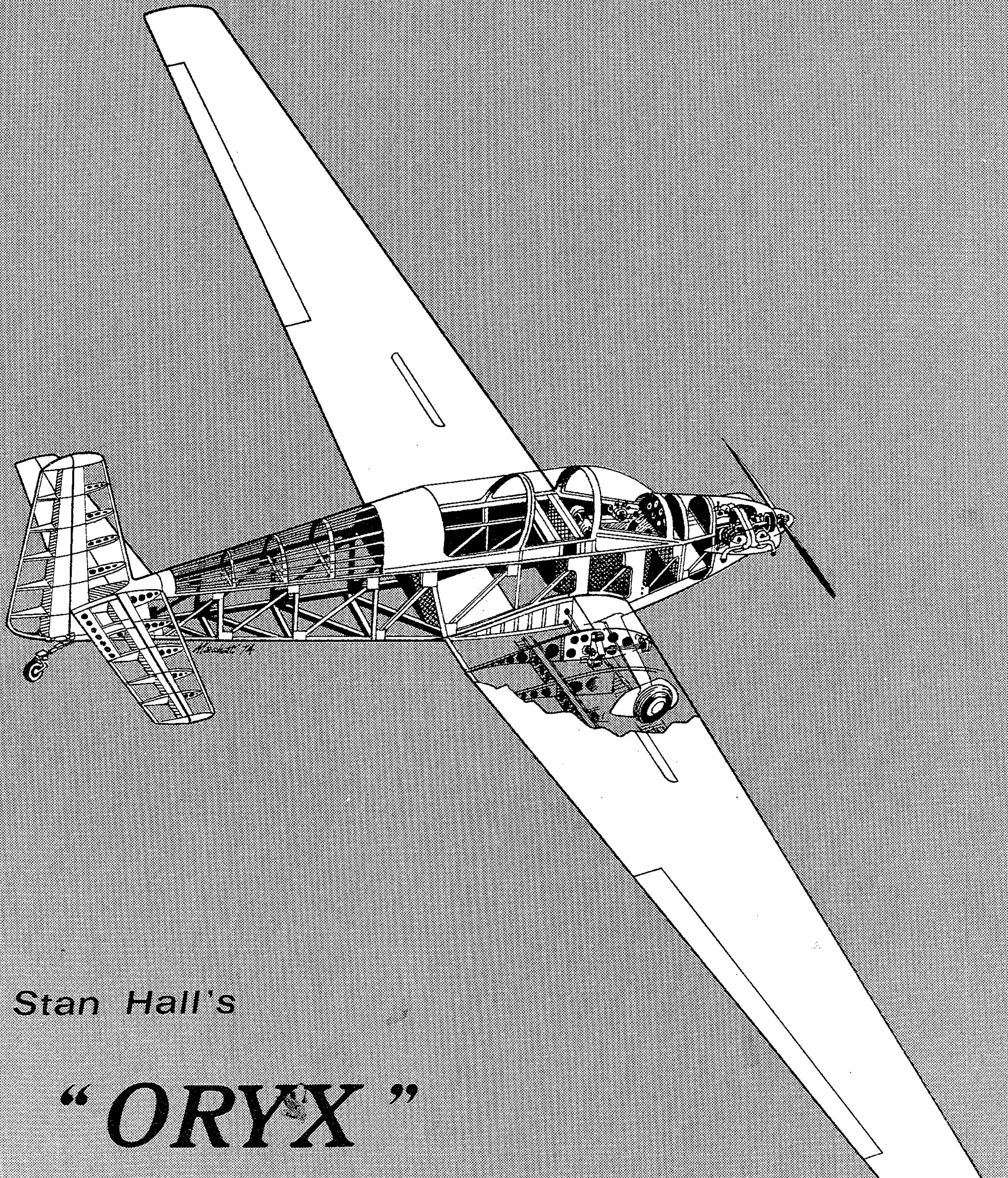
MOTORGLIDING

DECEMBER 1973



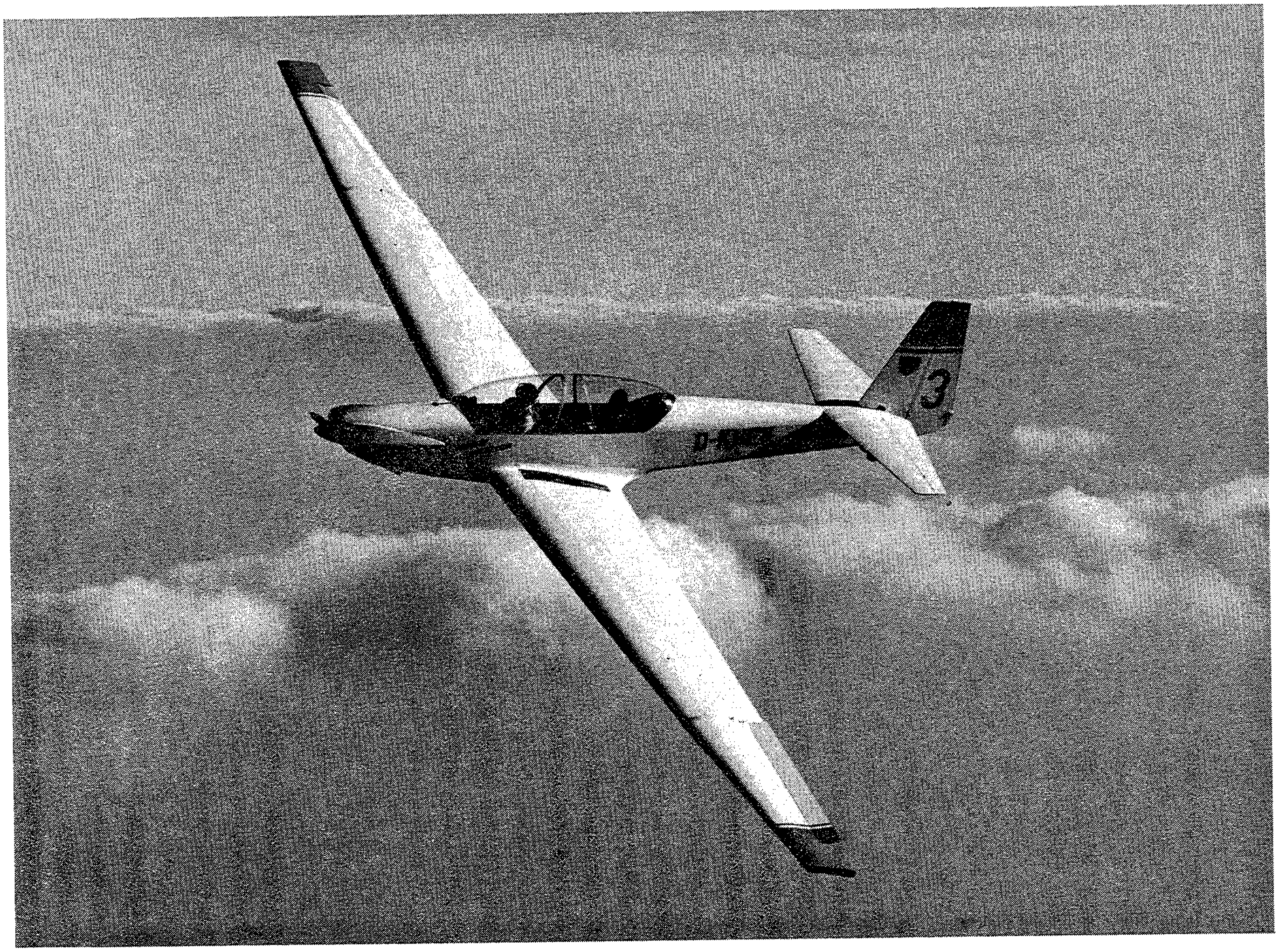
Stan Hall's

"ORYX"

YEAR AROUND UTILIZATION & INCREASED ECONOMY

IF YOU WANT MORE ENJOYMENT FOR LESS COST

FLY A **POWERED** SAILPLANE



RF 5 B

TYPE	SPAN	L/D	DELIVERY	SEATS	HP	ENGINE	MIN R/S
SFS-31	49 ft	29	6 months	Single	36	VW	2.8 ft/sec
RF-5	46 ft	22	6 months	Dual	68	VW	4.6 ft/sec
RF-5B	57 ft	26	6 months	Dual	68	VW/Frank	2.8 ft/sec

Standard equipment includes: Airspeed indicator(s), Altimeter(s), Variometer(s), Magnetic compass, Gear warning light and horn, Safety harness(es), Seat cushion(s), Tail antenna, Cabin vent(s), Recording tachometer, Oil pressure gauge, Battery, Oil Temp. gauge, Ammeter, Starter (elec.), Exhaust silencer(s).

SPORT-AVIATION INC.
401 HOLMES BLVD. WOOSTER, OHIO 44691 (216) 262-8301

MOTORGLIDING

Donald P. Monroe, Editor

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Circulation of the November 1973 issue was 820.

EXPLORING THE SOUTHERN CALIFORNIA SHEAR LINE, MOTORGLIDER STYLE

by Tasso Proppe

For the southern California soaring community, the shear line is somewhat of a standard commodity, like ridge soaring. To me, it was new and I wanted to find out what it's all about.

The best explanation I could obtain was this: The shear line is a stationary front, a line along which two air masses of different properties meet with an associated exchange of energies; in this case, it is the hot and dry desert air of the Californian hinterlands meeting the maritime air out of the greater Los Angeles basin. The latter air mass is humid, not so hot, and smoggy. Sometimes, you can really see the brownish soup sitting over the countryside. The exchange of energy is heat transfer from the desert air to the cooler mass. Along the contact line, the warmed-up cool air expands and rises, being replaced by a constant flow from the cooler side of the front. That means northwesterly winds and downdrafts inside the cooler air and, of course, lift on the shear line itself.

This sounds all fine from exciting verbal and written reports. However, the shear line isn't always that simple, and most of the time, it has a few deficiencies. The rotor edge altitude is generally limited by an inversion level, and the line is not continuous but broken up by the terrain of the hills underneath. Sometimes, though, when the air is unstable, the rotor triggers thermals along its edge. They tell me that the shear line itself can be recognized by a string of dust devils "you just have to follow...." The lift is to be found along a narrow edge, too narrow to circle in. the old urge to flip into a tight turn when you find lift leads you astray. In the shear line, you fly straight until the lift quits, and then you try to zigzag to where it might continue. However, the lift line itself is crooked, and that makes things more confusing.

I found the lift very moderate, sometimes too weak for my *Crow* to sustain altitude. I also found out: If the lift is strong, it lasts only five to seven seconds, and you better turn back and try to find that again: you have a real thermal by the tail that may afford you a better view from the top.

Since I don't have an unlimited amount of time at my disposal to wait for ideal conditions, I have to make the best of what's there whenever I can afford to fly.

On July 1, I took off from Hemet at 11:05, heading west towards a quite visible smog line. It was too early to expect much soaring yet. I shut the engine down three times but the lift was not sufficient for my ship to maintain altitude. So, I resorted to my "Adjustable Gliding Angle" mode, keeping the engine running on minimum power so that any presence of lift manifests itself as an altitude gain rather than a temporary relief from worrying about an emergency landing. It allows you to explore the conditions thoroughly and in comfort.

At 12:15, I hit a small area of strong lift which turned out to be a real thermal that carried me to an altitude of 4900 feet, southwest of Sun City, good enough for a straight-in glide into Elsinore for a (glider-) touch-and-(motorglider-) go at 12:47.

From there, I needed the engine for 15 minutes to climb out heading back to the shear line—there was nobody around to show me a good thermal.

At 13:07, I located one, south of Sun City, cut the engine at 2600 feet and soared to 6200 feet. With that altitude, I glided back into the line of smog that started north of Sun City. By that time, there was enough lift in it to maintain an average of 3500 feet with the engine off for good.

I traveled northeast, passing between Perris and Hemet, hit another thermal at 14:00 up to 5600 feet and back again to shear line level which eventually rose to 4200 feet northwest of Hemet.

By that time, I felt pretty smug— until disaster struck at 14:30. I noticed a dust devil moving slowly over the landscape at a distance, and I decided to dive for it. Somehow, I didn't make it. When I arrived at where it was, I found only turbulence and no lift. I also found myself darn close to the ground at 1800 feet. (Hemet is 1500!)

Well, in a motorglider, this is not really a disaster; you switch the ignition on and punch the starter button. After having soared continuously for 1 hr 45 minutes, the engine needs a little warm-up time before you demand climbing power for getting back up to where you belong.

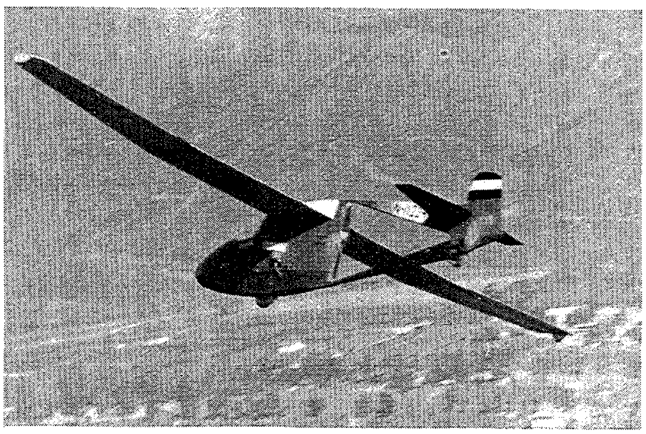
The rest of the flight was uneventful. I headed back to Hemet and cut the engine eight minutes later at 3100 feet in a thermal that got me up to 5600 feet where I joined the rest of the Hemet soaring fleet that was cavorting around in an abundance of lift everywhere in that area.

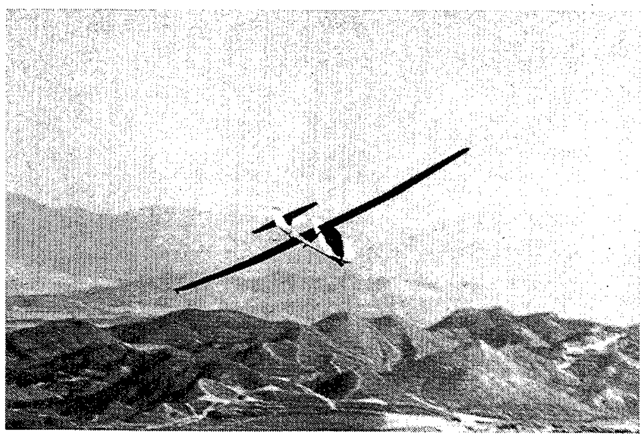
The resulting logbook entry: I flew the shear line in a low performance sailplane on a day when nobody else could connect to it.

Total flight time: 4 hr 25 min.
Total engine time: 1 hr 34 min. (35.5%)

Total expenditure: 84 cents. (2 gal of automobile ethyl gasoline. My engine does not take to aviation gas too kindly.)

The catch: I had to rely on seven inflight engine restarts, but that's what motorgliders are meant for.





Photos by Ben Pesta

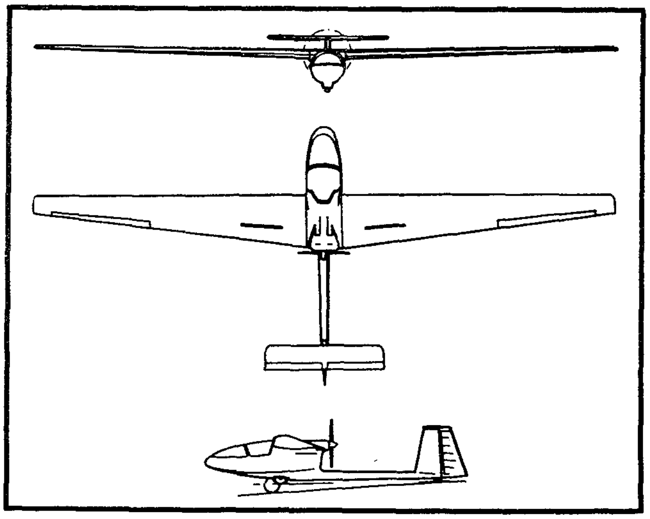
FOREIGN SCENE

by S. O. Jenko, Dipl. Ing. ETH-AMTECH SERVICES

The following summary is based on articles in the August 1973 issue of *Aviasport* and the September 19 issue of *Skrzydlata Polska*.

The first modern Polish auxiliary-powered sailplane SZD-45 *Ogar* began test flights at Bielsko-Biala. This new two-plane design features side-by-side seating and a mixed construction: wings, tail and forward section of fuselage are fiberglass; central part of fuselage and boom are of aluminum alloy.

The engine is a VW Limbach SL-1700EC with a Hoffman 1.5 m diameter propeller.



Technical data:

Span	17.5 m (57.4 ft)
Wing area	205 ft^2
Aspect ratio	16
Length	26.1 ft
Empty weight	1000 lb
Gross weight	1385 lb
Wing loading	7.3 psf
Max. airspeed	124 mph
Rate of climb (power)	740 ft/min
Glide ratio (2 persons)	27.5
Min. sink (2 persons)	3.2 ft/sec at 45 mph

JET-POWERED SAILPLANE

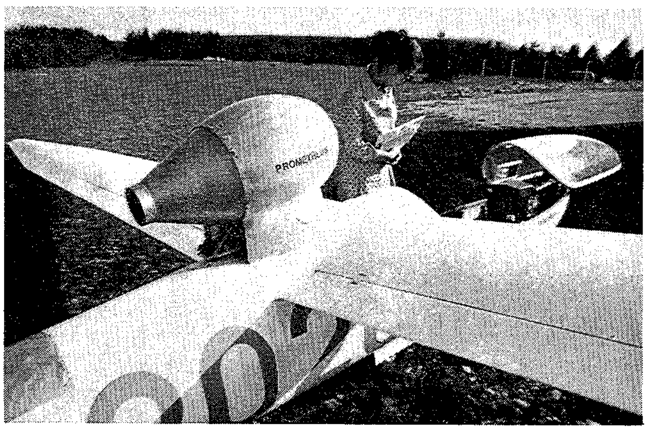
An article in the May 1973 issue of the German magazine *Flieger* presents reasons for and a description of the Swiss auxiliary-powered sailplane *Prometheus I* which has a jet engine. An abridged translation of the article is presented here.

A few members of the Soaring Group at the Swiss Federal Institute of Technology (ETH) started in 1971 a design project which would feature a jet engine installation in a high performance sailplane. Some of the participants were: T. Bircher, one of the *Diamant* designers; A. Schiller, the designer of FS-1; P. Senn, experienced in aircraft repair work, and D. Favarger, leader of the technical section of the Soaring Group.

T. Bircher received in December 1970 on a two-year loan from manufacturers a *Diamant 18* and a jet engine "Eclaire II" (176 lb of thrust). The original aim of the group was to design a two-place performing sailplane with a jet engine (264 lb of thrust) suitable for beginners as well as experienced pilots; also for wave soaring and atmospheric research. While the advantages of a sailplane with an auxiliary reciprocating engine are well established the jet engine provides additional benefits such as flights at high altitudes, less vibration, approximately four times better power/weight ratio and less air resistance. Furthermore, under certain conditions the cost/hour for commercial operation is comparable to a "pure" sailplane.

To facilitate the use of the same engine on various sailplanes (i.e., removable installation) a soaring group may have, the decision was made to position it above the fuselage. Thus the jet engine "Eclaire II" was installed on top of the *Diamant 18* fuselage. This was not a new idea. A substantial advantage of the *Diamant 18* were the wing tanks which reduce the structural loads as compared to a fuselage tank installation. In addition, the above-the-fuselage installation provides an undisturbed air intake resulting in a better performance and cooling as compared to an installation in the fuselage.

The jet engine exhaust heats to some extent the fiberglass vertical tail. An aluminum covered vertical tail would be desired but not required to facilitate a a better heat transfer (cooling). On the other hand the response of the rudder is also better. The nose-heavy moment due to the jet engine thrust (above the cg) is partly compensated by the increased air velocity due to jet exhaust over the underside of the horizontal tail which is mounted on top of the vertical tail. Flutter of the tail due to jet exhaust is of no concern; however, it is noticeable at higher power settings (rpm). All these small problems caused by the T-tail could be removed by a classical V-tail, preferable of metal construction.



The following technical data provide an insight into this design modification.

The jet engine "Eclair II" develops 176 lb of thrust at 48,000 rpm, sea level and 59° F. The total weight is 81.5 lb.

Sailplane performance (jet engine not operating):

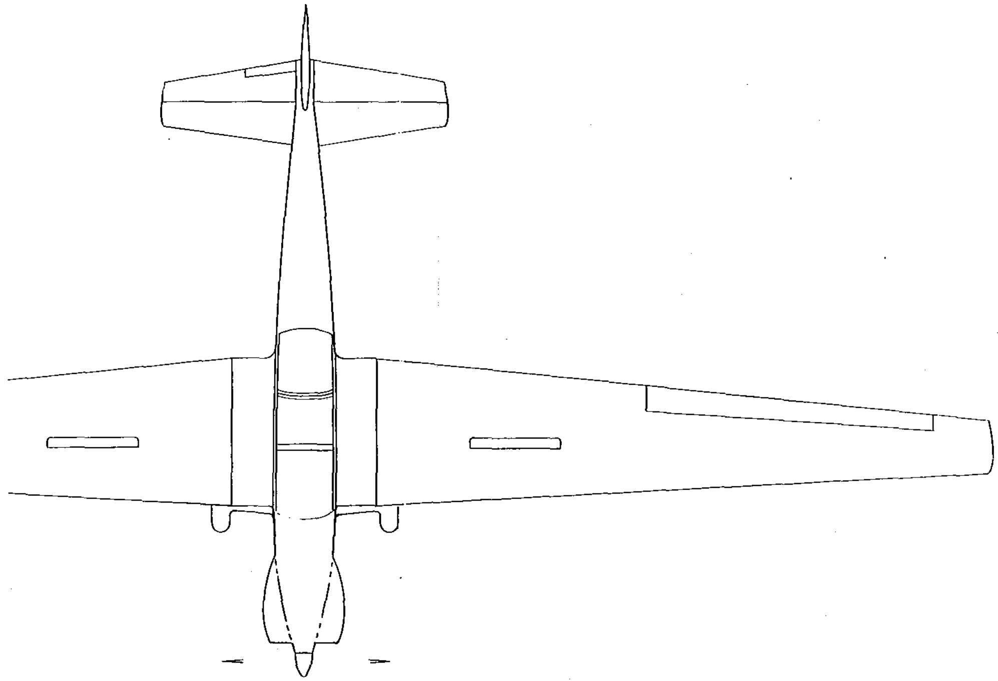
Gross weight (incl. 21 gallons of fuel)	1150 lb
Stalling speed	44 mph
Glide ratio	40
Min. sink	2 ft/sec at 50 mph
Sink at 93 mph	5.25 ft/sec

Sailplane performance with operating jet engine:

Theoretical ceiling	49,000 ft
Service ceiling	39,400 ft
Cruising speed	149 mph
Range	186 miles

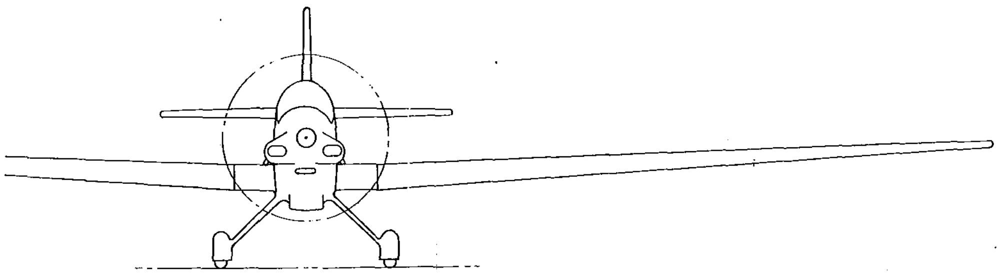
Altitude (km)	0	3	5.5	8	10	12
R/C (m/sec) (@ 48,000 rpm)	3.7	2.5	2.0	1.7	1.1	.8

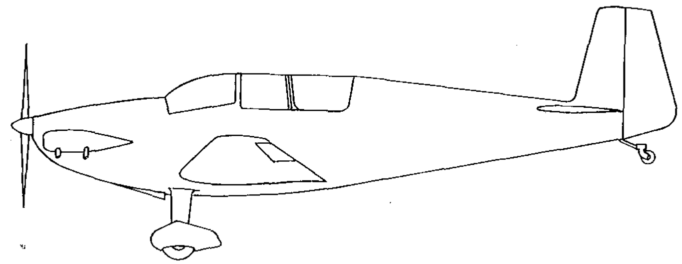
Due to presently installed electronic fuel metering device the sailplane should be flown below 6 to 7 km (22,000 ft) in order to avoid engine overspeeding due to excess fuel supply. Thus the performance data above this altitude are at present only theoretical.

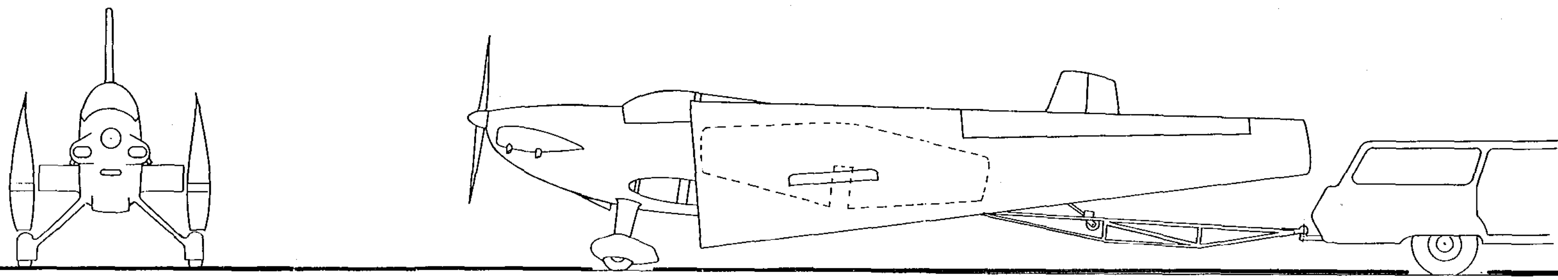


ORYX BASIC DATA

Crew	2
Span	48 ft
Wing Area	117 ft^2
Aspect ratio	13
Length	23.2 ft
Empty weight	860 lb
Gross Weight	1350 lb
Fuel capacity	12 gal
Engine	1600 cc VW
Propeller speed reduction	1.59 to 1
Propeller: wood, fixed pitch	70 x 35
Main landing gear wheels	5:00 x 5
Construction material-Douglas fir, fabric	
Wing construction-single spar, D-tube	
Airfoil - NACA 63_3-618 - 63_2-615	







STAN HALL'S *ORYX*

As was noted in October *Motorgliding* Stan Hall says that his two-place *Oryx* "is intended to be a poor man's RF-5B. Like the *Cherokee II* it isn't intended to compete with anything except affluence. It will be the *Cherokee II* of the motorgliding set. Nothing spectacular in the way of performance—but enough to have a lot of fun with. And anybody will be able to build it. All wood and fabric —just like the *Cherokee*." Stan does not with to release construction details, performance information, etc., until the *Oryx* is test-flown and debugged. Stan is incredibly busy and asks that readers not write him for further details. Please respect his wishes.

CONCERNING YOUR *MOTORGLIDING* SUBSCRIPTION

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THE ECONOMY OF SELF LAUNCHING SAILPLANES

by Elmer Balint

Considering the high initial cost of motorgliders many individuals and clubs who are seriously interested in this type of machine are hesitant to make the big move and place an order of purchase. Besides the capital investment required, there is little information available regarding operating cost and the vague references to very low operating cost are received with some skepticism.

The following is what we believe a long-overdue, more-detailed account of the operating cost of motorgliders. Depending on the type of ownership (individual, syndicate or club) and base of operation, there are a number of variables which we tried to reconcile. In any case, we feel that our calculations could be used as a framework, where individual items could be substituted if local conditions warrant. We used our own Sportavia-Puetzer RF-5B *Sperber* as a basis for our calculations. It should be noted, that with the exception of the Caproni A-21J, the *Sperber* is the most expensive motorglider on the market. The figures obtained are so much more astonishing. Lower priced models such as the *Falke* or the single seater *Milan* should necessarily show a corresponding reduction of operating cost.

Now let us see how expensive this *'Mercedes* of the air' really is.

FIXED COST:

Depreciation (5% of $20,000)	$1,000
Insurance	$ 400
Inspection for C. of A.	$ 100
Total yearly fixed cost	$1,500

OPERATING COST, ALL POWER FLYING:

Hours per year	100	200	300	400
Fixed cost/hr	15.00	7.50	5.00	3.75
Engine cost/hr ($1200/1500 hr) say	1.00	1.00	1.00	1.00
Airframe maintenance	1.00	1.00	1.00	1.00
Gasoline at 4 gal/hr	2.00	2.00	2.00	2.00
Oil & misc. maintenance	0.25	0.25	0.25	0.25
Total cost/hr	19.25	11.75	9.25	8.00
Total cost/min	0.32	0.20	0.15	0.13

OPERATING COST ALL SOARING FLIGHT:

Hours per year	100	200	300	400
Fixed cost	15.00	7.50	5.00	3.75
Airframe maintenance	1.00	1.00	1.00	1.00
Total cost/hr	16.00	8.50	6.00	4.75
Total cost/min	0.27	0.14	0.10	0.08

It is evident from the above, that the most significant drop in operating cost occurs at the 200 hour per year utilization. Any variation of power on or soaring flight can easily be calculated from the above figures to suit individual users' requirements. According to expected yearly hours to be flown, clubs should be able to assess flying fees to members and ensure a reasonable profit for the club. Assuming 400 hours per year we suggest $14.00/hour or 24¢ per minute of powered flight and $10.00/ hour or 17¢ per minute of soaring flight. This seems to be a reasonable price for the average club member and compares favorable with the $12.00 per hour average for three years, which this writer paid flying club-owned equipment.

However, this is not the whole picture. Whether we realize it or not, the cost of retrieve is substantial for the cross-country pilot. Considering a simple 100-mile flight, self-retrieve will cost $14.00, while trailering requires in the best of the cases 200 miles driving at about 12¢/mile. That is $24.00 without counting food and beer for the retrieving crew. An additional fringe benefit is that the motorglider will be back on the field within four hours and put to profitable use in instructing for the rest of the day, while a pure glider is out of commission for the whole day, even after the shortest of cross-country flights.

A reasonably active soaring pilot will fly approximately 100 hours per year. At this rate a motorglider seems to be the ideal solution for a four-pilot syndicate. Considering 25% powered operation (self-launching and self-retrieve), the hourly cost for flying is $5.00 which is astonishingly low. Capital investment would be approximately $5,000.00 per pilot if a *Sperber* is used, which, being a two-seater offers the dubious advantage of your mother-in-law coming along for the trip. The single seater *Milan* would require $3,750.00 capital investment per pilot and even lower operating expenses.

Let us consider a private owner in the $5,000.00 class glider flying 100 hours a season and doing ten 100-mile cross-country flights.

FIXED COSTS:

Depreciation (5% of $5,000)	$250
Insurance	$ 75
Inspection for C. of A.	$100
Total fixed costs	$425

OPERATING COST 100 HRS/YEAR FOR $5,000 GLIDER:

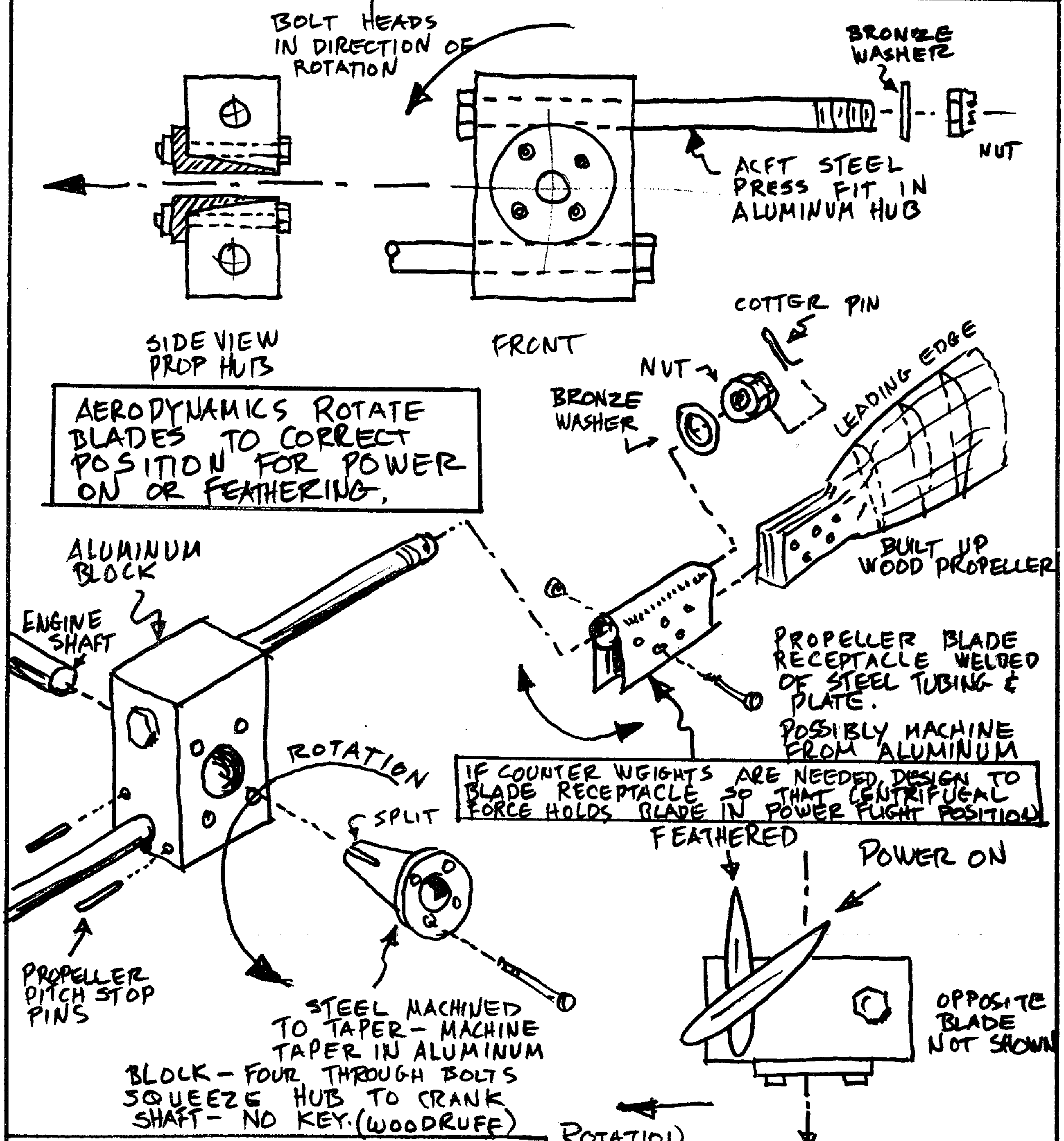
Fixed cost	$425.00
Airframe maintenance	$100.00
33 Aero-tows (3 hrs. average flight time) at $4.00 per tow	$132.00
10 retrieves 200 miles return trip each 2000 miles at 12¢/mile	240.00
Total cost	$897.00
Cost per hour	8.97
Cost per minute	0.15

This compares with $5.55/hr. or 0.09/min. for the *Sperber* operated by a four pilot syndicate. The same group flying the single seater *Milan* could expect 15% reduction of cost, which makes the syndicate ownership of motorgliders a very attractive proposition. (Reprinted from June-July 1973 *Free Flight*.)

A FEATHERING PROPELLER FOR MOTORGLIDERS, ETC.

A DESIGN STUDY
5 DECEMBER 1973

LOW HP ENGINES — DICK HENDERSON — 16" TO 48" DIA



PROPELLER ASSUMES CORRECT PITCH ANGLE WHEN ENGINE STARTS — PROP FEATHERS WHEN ENGINE STOPS. LIGHT SPRINGS AND COUNTER WEIGHTS MAY BE REQUIRED.

END VIEW OF ONE BLADE — POWER ON AND FEATHERED

LETTERS

Editor:

I would like to add to the interesting account by Landon Cullum, Jr. which appeared in the July issue of your magazine.

Perhaps I should first declare my interest in motorgliders. I am the British agent for the Scheibe motorgliders, and am thus in a better position than your reporter to have discovered many other facts about the motorgliders because of my knowledge and understanding of German, and my familiarity with these motorglider competitions and meetings dating back to 1965.

(Concerning the scores) your reporter has got confused between the daily results and the cumulative score at the end of each day. For example it is impossible to score more than 1000 points on any individual day, but after three days the scores of the leading motorgliders were over the 2000 mark. The contest was divided into single-seaters and two-seaters, and further divided between advanced and less-advanced.

In the single-seater class they were all counted as advanced except the Schleicher Ka-8bM, which is the glider shown in the photograph on page 8 (of the July issue). Because there was only one in this category it was combined with the two seaters, and flew with the less-advanced Scheibe SF-25 *Falkes*, the RF-5, and the experimental Mu-23. Having a rather better performance than these two seaters it actually won this class. I have full details of this very interesting motorglider, which probably represents about the cheapest way of having a self-launching single-seater, and would be glad to make this the subject of another article for *Motorgliding* if you are interested. Amongst the single-seaters were also two *Kraehe* (not *Kausch's* as described by your reporter) and regular readers of *Motorgliding* will not need to be told any more about them. They did not take part in the competition.

The AK-1 is in fact fitted with the same Hirth engine as is used in the AS-K 14 and SF-27M's, but because it is mounted horizontally it looks quite different to the SF-27M installation where the cylinders are in the vertical plane. A particularly interesting single-seater is the SF-27M fitted with *Cirrus* 18-meter fiberglass wings. This has been fitted with an experimental two-cylinder Hirth from a snowmobile and develops 44 hp. It drives through a cogged-belt reduction gear. Another SF-27M had a similar engine driving the propeller directly. In his account of the visit to the Sportavia factory at Dahlemer Binz he gives the impression that the major parts of the Scheibe *Falke* are built there. In fact, the position is that the Scheibe *Falke* is in full production at the Scheibe factory at Dachau near Munich, but that it is also license-built by the Sportavia people at their factory near Cologne. The SF-31 *Milan* is a marriage of the fuselage of an RF-4 with the wings of an SF-27M. Performance is not quite as good as the AS-K 14, but many pilots prefer to have an engine in the nose, and prefer the Volkswagen four-stroke to the Hirth two-stroke engine.

Developments in the motorglider world are now turning to increasingly high-performance aircraft. One pilot has already ordered a Schempp-Hirth *Nimbus* fitted with a 55 hp Hirth retractable engine, and a motorized version of the *Standard Cirrus* was shown during the early days of the competition in a semi-completed state. It is also an open secret that the Scheibe factory are studying the design of a *Bergfalke IV* two-seater with retractable motor.

As this has a gliding angle of 1 in 34 it should satisfy most people, even though the performance will not reach the standards of the Caproni *Calif* (perhaps the price will be a little bit more acceptable!). The results sheet shows the number of minutes of engine running time required by each competitor, and it can be seen that on some days almost all the gliders completed the course without using the engine at all.

I have taken part in this competition in previous years, and was lucky enough to be given a seat in a Scheibe SF-25C (that is the *Falke* fitted with the Limbach engine) on the first two competition days. The penalty for use of engine is very severe in terms of lost points, and it is worth circling for at least a quarter of an hour instead of using one minute of engine. It requires very fine judgment to decide when conditions are so bad that one minute of engine will get you into better conditions and save more than 15 minutes of circling in a weak or dying thermal. We had several hours of soaring in close company with the Ka-8B, whose glider performance did not seem to be very much better than ours, but which could fly slower and more tightly in the very weak thermal conditions prevailing.

Whilst thanking Mr. Cullum for his kind remarks about the comparision between the RF-5B and the SF-28 *Tandem Falke*, I think it only fair to say that the difference is very small indeed (if it exists at all), and the poor results of the RF-5B were largely due to one of their top pilots failing to start his motor on the first day and having to land (this disqualified him for the day), and the other pilot running into barograph failure which also disqualified him for a day. On a five-day contest one cannot afford to lose a whole day's points. The SF-28 scores in being cheaper, and without a retractable undercarriage it is less complicated and much less expensive if you forget to lower the undercarriage! As I am the Agent perhaps I should not press my luck in this account by praising the product that I sell!

Peter Ross
Bucks, England

Open letter to Hans Zacher, who is the Father of the Burg Feuerstein motorglider meet and a subscriber to this magazine.

Dear Hans:

In the October issue of *Motorgliding*, I read S. O. Jenko's report on the Motorglider Meet, May-June at Burg Feuerstein.

In the discussion, Mr. Jenko explains the point formula and states that any penalties pertaining to span, engine power, and gliding angle have been dropped. I agree that there should be *no* restrictions to engineering perameters. However, I offer this as a vital input to stimulate a sense of direction in motorglider design:

The *real* reason for motorgliders to come into existence is *economy of operation*, to become independent of the costly support systems of "pure" soaring (winch, winch operator, power airplane, tow pilot, line boys, retrieving crew and trailer).

If somebody wants to perform exceptional achievements (distance, altitude, speed triangle), he should do so on today's or tomorrow's highly-bred fiberglass or graphite composite ships. There is *no* immediate need to pursue the same line of development only with an engine in it.

To make the joy of soaring accessible to a broader spectrum of interested people (we need a broader basis for the sport to survive), we must further the development of sailplanes that are more economical in terms of manpower usage and equipment cost. This means simplicity of operation and lower initial cost, balanced against soaring achievement capabilities.

Any point evaluation system, therefore, should not only consider a point deduction for engine-on time (or fuel consumption) but also, the accumulated points from any task achievement should be divided by the cost of the machine (in kilo dollars, maybe) so that a motorglider which cost only half as much has to fly only half the points to receive the same recognition as the expensive ships in the evaluation.

A more sophisticated approach would be to proportion the engine-on penalty by a cost-of-acquisition factor so that a less expensive ship could afford more engine-on time for equal opportunity. I personally don't think much of this—although, in a real life environment, the engine-on time of a motorglider seems to be closer to 30% of flight time than the wishful dream of 10%. This real life environment may require some definition: it means flying when you happen to have time to fly between your job and the family projects. This does not normally happen to coincide with ideal soaring conditions.

Dividing the flown achievement points by the ship's initial cost would result in the following: Scheibe, Puetzer, Schleicher, and whoever produces motorgliders, will tend to design for moderate performance and, hence, less expensive gear. Stan Hall and the Brditschkas in Austria are already on that route.

There will be more people and clubs

in a position to buy one and enjoy competing in meets. The new way of soaring —freed from the cumbersome ground support—will become more known, motorgliding will be more visible and attract more prospective aeronauts. Once it becomes a recreation business like campers and dune buggies, plastic and fiberglass mass production will move in and make 'm cheaper yet.

Not until *then* can we afford to turn to the expensive ships and let them loose in unlimited competitions of their own.

So: Divide (by $) and conquer!

Tasso Proppe
Lemon Grove, California

November 15, 1973

Editor:

Attached is a check to cover the next twelve months subscription. I'm not aware when my subscription expires and want issues of *Motorgliding* to come to me. I'm enjoying them very much.

I first flew an RF-5B in England, Biggin Hill, last March and again in April where one was placed on order and received delivery of my machine in August.

Since obtaining delivery of the RF-5B, I have flown it a total of about 100 hours.

Accompanying me on several flights have been competition sailplane pilots, military aerobatic instructors, among others.

Comments from qualified people with a world of experience have been that the stalls have all of the characteristics that are highly desirable.

Behavior of the bird in every respect is good except takeoff. If the pilot permits the tail to come off the ground prematurely, or applies power too quickly—or worse, both—the machine will dart to the right like a jackrabbit. Full left rudder must be employed for correction. If takeoff is made tail down and slowly applying power as prescribed in the manual, there's no difficulty.

Practical sink rate exceeds that of the book, (which is of course optimum). I recently checked sink rate from 7000 feet to 1500 in still air and it clocked out at around 250 ft. per minute (rather than 195 as stated in the book) for two people with full load, temperature approximately 40° F.

A couple of my friends who are purist competition sailplane pilots looked the machine over and observed rather candidly that they would like to have my services this coming winter and spring, to go up into the mountains and "sniff for lift."

Cross-country, ridge and wave soaring are this machine's finest characteristics. I believe that one can learn more in a season of soaring, safely, with this machine than they could in many years of experimentation with an ordinary sailplane.

Time-consuming and laborious retrieves are not my "cup of tea." Neither do I enjoy the hassle with the farmer over crop damage, nor the specter of a laid up bird waiting for repairs.

Insofar as engine reliability is concerned, the VW engine is tops. At least the VW will start with a great deal more reliability than any of the many aircraft engines with which I've had so many frustrating starting problems.

Certainly there are things to be criticized and this one is no exception. The turning radius could be shorter. We would all like to have a 50 to 1 glide ratio with the sink rate of a buzzard and the price of a *Pinto* automobile, but such is not within the realm of possibility. Better machines will be built, but so far, the RF-5B appears to offer the best of both worlds, of soaring, coupled with self-launching and reliable restarting capability.

George C. Sells
Johnson City, Tennessee

December 21, 1973

Editor:

...I am very happy with the ship. Now have fifty engine hours on it; the only difficulty so far has been with the pilot. I started it the other day at two degrees below Fahrenheit with no problems.

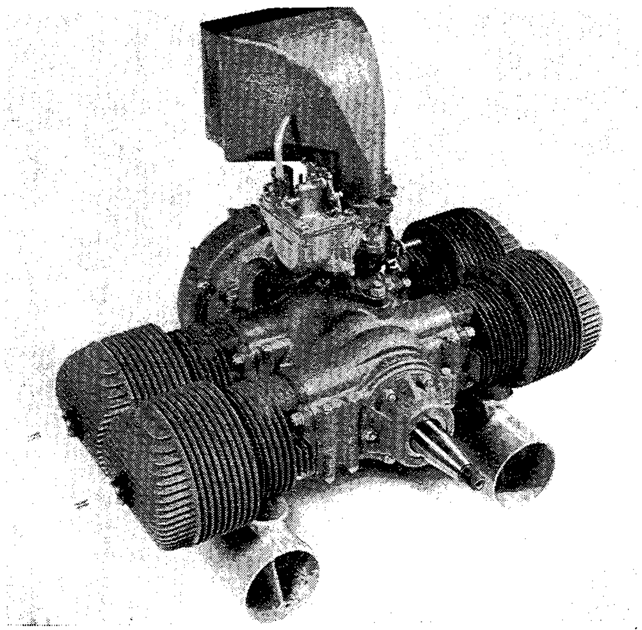
The full feathering definitely improves sailplane characteristics and makes the ship much more pleasant to fly. Never have any aggravation with windmilling with this Hoffman propeller.

George C. Sells
Johnson City, Tennessee

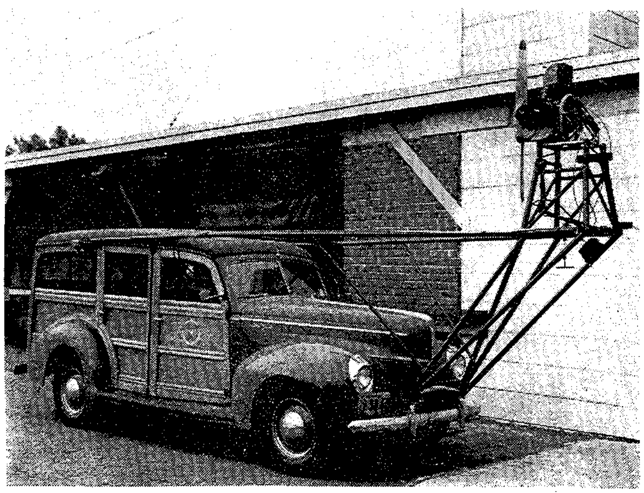
Editor:

If we go back to August *Motorgliding* we might conclude that no one with a powered sailplane is interested enough in the request for thrust measurements to bother to do anything about it and submit it. Thus it has been of interest to research a little of the literature, and what is better for that than *Soaring* magazine?

Thus I submit some pearls from Harry Perl, in May-June 1955 *Soaring*.

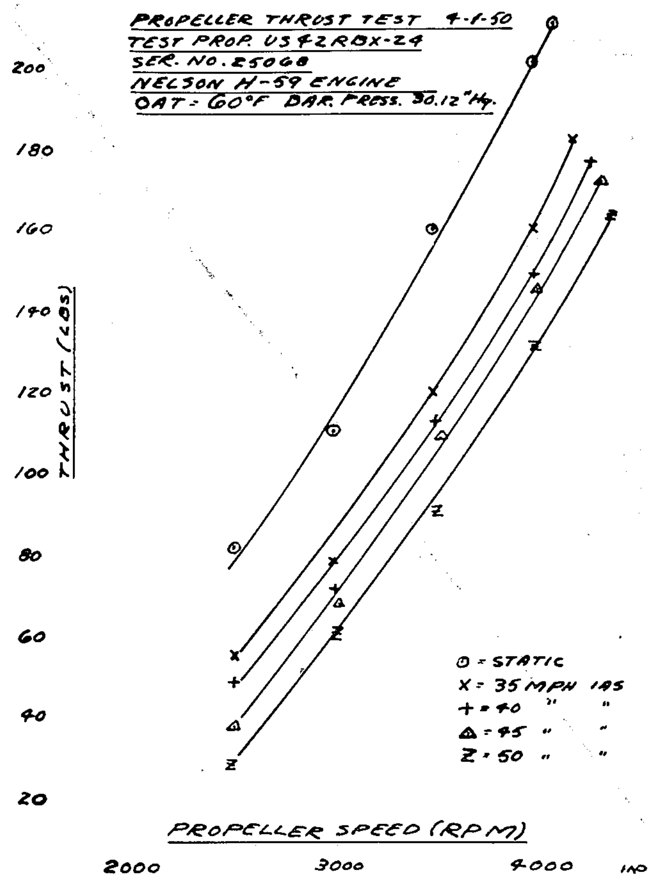


The Nelson H-59 four-cylinder two-stroke cycle engine which develops 40 hp at 4200 rpm.



The mobile test stand which was made in order to establish some criteria for design purposes.

The net thrust vs. rpm at various indicated airspeeds for a representative test propeller.



Thanks for answering my request, Harry, even if you didn't do it until twenty years before I asked for it.

Stephen du Pont
Fairfield, Connecticut

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POSTFLIGHT NOTES

An article by Ron Moulton in the December 6, 1973 *Flight International* reports on an electric motorglider. Moulton reports that on October 21, 1973, Heino Brditschka flew MD-E1 (Militky Brditschka Electric One) for 9 min 5 sec, to an altitude of 300 m (975 ft), at Linz, Austria. Fred Militky, a German model designer, was attracted to the ex-Austrian Raab *Kraehe (Crow)*, which is now being produced by Heinz Brditschka, Heino's father, as being suitable for electric drive. Brditschka provided the HB-3 airframe. Moulton reports that a Bosch 10-kW motor and Varta batteries were used, with a belt-drive to a 1.5-m diameter propeller. Thirteen horsepower was produced, with a 132-lb gross weight increase. Moulton states that with development, the prospect of 40-minute power storage is feasible.

In the December 1973 issue of *Western Aviation*, Jim Wright, *Hot VW's* Editor, writes about a development of a VW-based engine for homebuilts. Lloyd Paynter, 4032 Crown Point Drive, San Diego, California 92109, a retired aircraft machinist, relying on help from Joe Alldredge, of DMI Parts, of La Jolla, California, is aiming at a goal of 75-80 horsepower from an engine weighing 150-160 pounds. His engine is based on a VW 40-hp crankcase. He uses a planetary gear reduction system, driven off the flywheel end of the powerplant, which gives a 30 percent reduction in rpm from the crankshaft, according to Wright. A 68-inch propeller, with a 44-inch pitch is used. The engine is still in the prototype state. The displacement of the present engine is 1385 cc, but a 1600-cc engine is planned.

Meanwhile, the November 22, 1973 *Flight International* reports that Ted Barker, of Carlsbad, California, has built a turbo-charged VW engine conversion which produces 105 horsepower with 1834 cc displacement and a weight of 164 pounds. It has dual ignition. A Rayjay turbocharger is used, and a Hegy 50 x 50 inch propeller turns at 3700 rpm. The cost of a Barker conversion varies from $1-2000, according to *Flight International*.

An article called "The Soaring Flight of Vultures," by C. J. Pennycuick, appeared in the December 1973 *Scientific American*. Pennycuick describes some of the observations of vultures and other soaring birds that he was able to make using the unique capabilities of a powered sailplane. A Schleicher AS-K 14 had been provided by Anglia Television and Okapia Film for his research, which was conducted mainly over the Serengeti National Park in Northern Tanzania and neighboring areas of Tanzania and Kenya.

William Welch, of Danbury, Connecticut, recently inquired about the whereabouts of motorgliders in this country, with the hopes of using one in a study of hawk migration.