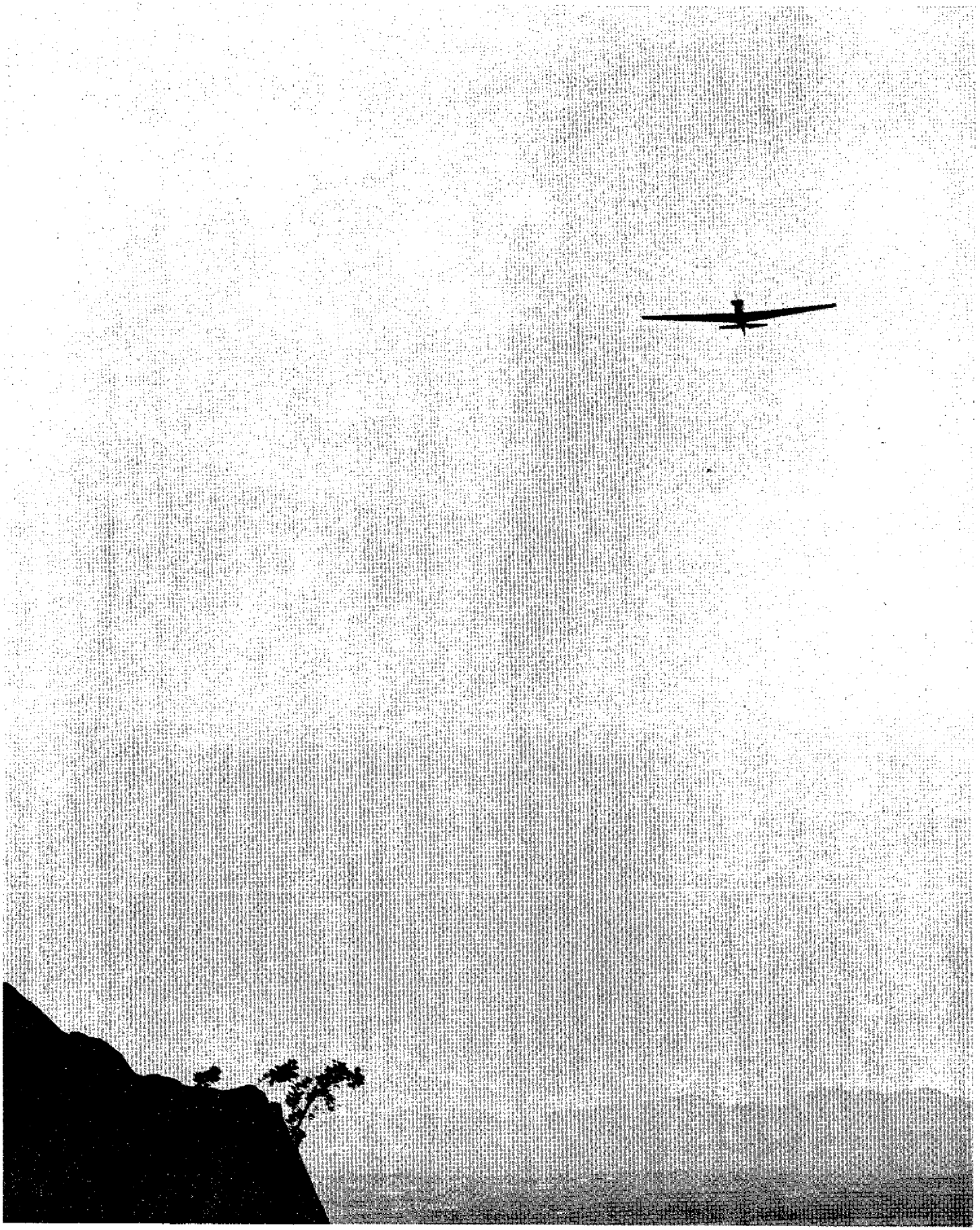
MOTORGLIDING

JANUARY 1974
50 CENTS



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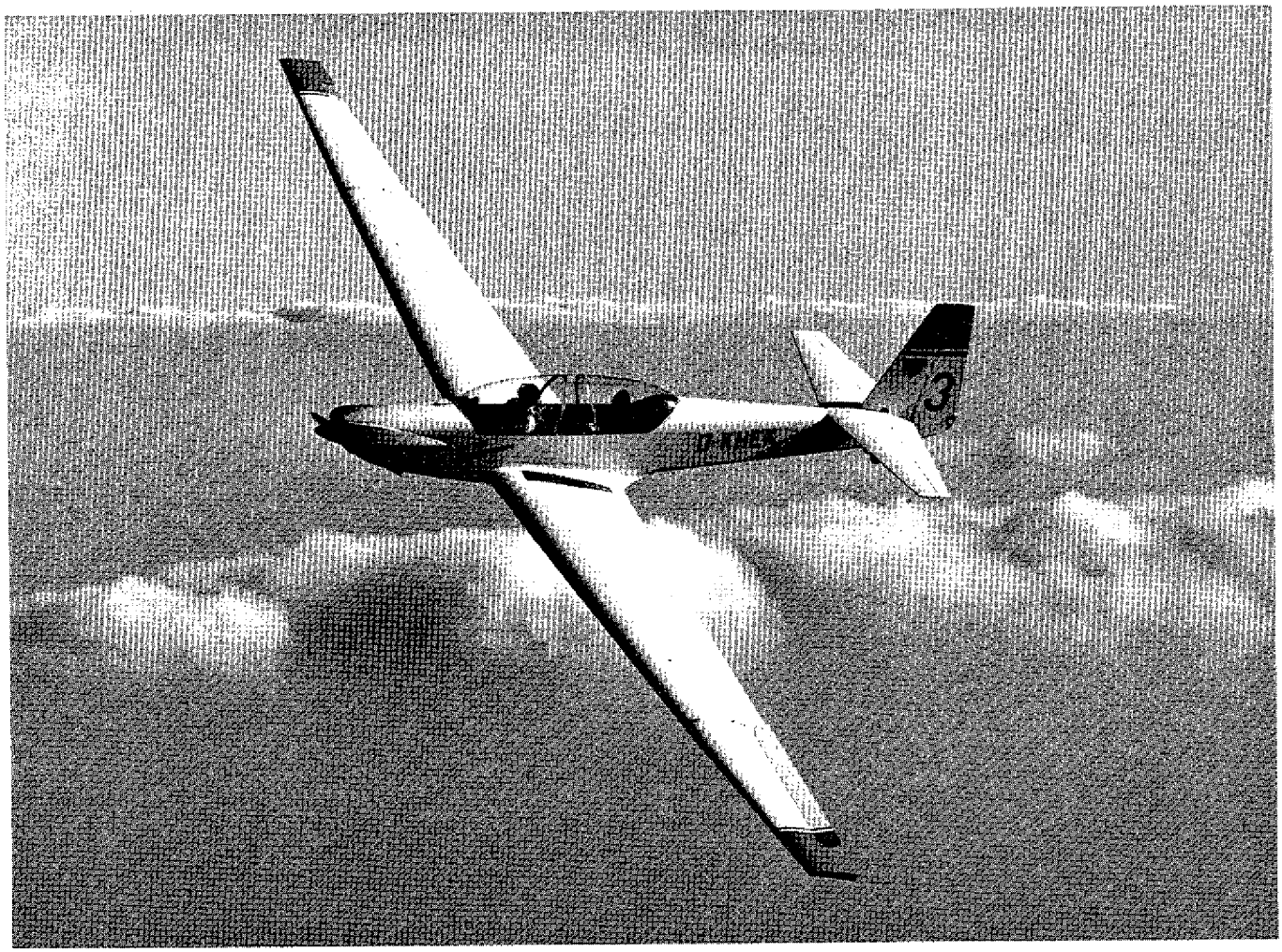

RF 5 B

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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Contents

Cover: RF-4D, by George Uveges

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Circulation of the December 1973 issue was 840.

SOARING THE BAY'S SANTA CRUZ MOUNTAINS A FIRST REPORT

by Bill Richards

The hardest part of writing this piece is getting up the nerve to do it, for I am neither a professional airline pilot nor retired military, I don't have 2000 hours in sailplanes, I'm not a competition pilot nor have I been soaring in the Bay Area since 1940. I'm merely a recreational pilot who enjoys antique aircraft, aerobatics and soaring.

When Bill Nutting and I ordered our RF-5B *Sperber* motorglider more than a year ago, we had in mind to seek out and explore the virgin soaring areas of Northern California as well as enjoying the well-known territories. Of particular interest was the wave potential of the pre-storm south wind as it flows over the Santa Cruz Mountains. Like numerous others, I had taken long tows in my Ka-8 from Sky Sailing across the Bay to catch this south wind wave, but I never felt particularly at ease over my prospects of getting home. I had found the wave to be steady lift and had reached 14,000 feet without difficulty.

On other occasions, when flying between Watsonville and Palo Alto, I had encountered strong erratic lift, turbulence and headwinds over an area roughly bounded by Santa Cruz, La Honda and Lexington Reservoir. Other areas that seemed to hold potential were Mt. Madonna and Mt. Umhumum south of Los Gatos, as well as the Big Sur coast.

We didn't get delivery of the RF-5B until June of this year—just in time for the summer blahs of Bay soaring. Other flying activities kept both Bill Nutting and myself from trying out the new sailplane in the Sierra Range or in Northern California areas by Shasta, Lassen, etc. That will have to come next year. But on to what we have found.

On numerous occasions we have discovered fairly dependable shear lift on a line from Black Mountain (back of Los Altos Hills) to the mountain back of Saratoga and Los Gatos. The location of the shear will shift daily but is usually marked by a smog front. It appears to top out at about 5000 ft ASL although we have ridden occasional thermals up through the shear to 6000 ft. A vineyard on the mountain crest just south of Black Mountain seems to kick thermals off fairly regularly. The shear is apparently caused by the air moving down the Bay and through the Santa Cruz pass meeting the onshore flow that comes in toward La Honda from the coast. A third flow of onshore air hooks around by Santa Cruz and all three meet in the area north of Skypark Airport. It's not great lift but it is interesting and challenging.

On another recent flight to begin exploring the Big Sur ridge soaring potential I encountered an interesting phenomenon that I'll have to investigate again. I had picked up a passenger at Watsonville and proceeded directly over to the coast at Pajaro Dunes. The day was clear with only light westerly wind showing on Monterey Bay. I positioned myself at about 400 ft ASL and slightly offshore and headed down the coast toward Monterey. I had intended to fly under power to the Big Sur but immediately found that I could bring the engine back to idle with a steady lift of 50-100 fpm. With no sea cliffs to cause upward flow and my offshore position I don't know what was causing the lift. By Fort Ord I had 1000 ft and was one-fourth mile out to sea but the lift remained constant on around the peninsula until we got to Carmel. Below Carmel the wind velocity picked up to an estimated 20 knots and was blowing nearly parallel to the Coast Range, hence not permitting ridge soaring with any degree of safety. Big Sur remains to be explored as well as this strange onshore lift.

Our most exciting flying to date, however, has been on the south wind wave. Preceding most of our Bay storms is a strong southerly flow of moist air. This flow is at right angles to the 3000 ft coastal Santa Cruz Mountain Range. If you live on the Peninsula, you have probably looked with longing at the long wave cloud that will lie from San Francisco to Hollister, generally over the El Camino Real, with a window a mile or so wide between the wave cloud and the hills. It's not the Sierra Wave, but it's our wave and it's there frequently and it's dependable. With the winter storm season just beginning, my log book shows the following flights, with all originating

and terminating at Palo Alto Airport.

Sept 22 - topped at 10,000 ft - 2½ hr flight.
Oct 21 - two flights to 7000 ft - 7 hrs total.
Oct 22 - stopped at 12,000 ft at passenger's request and returned to Palo Alto, and up again with a new passenger.
- stopped at 16,000 ft still going up 300 fpm! (No oxygen system.)
Nov 5 - topped at 10,000 over Mt. Madonna.
Nov 6 - weak wave - topped at 6800 ft
Nov 9 - stopped at 16,300 ft with 300 fpm lift - no oxygen yet!
Nov 11 - stopped at 16,000 ft with 150 fpm lift - still no oxygen.

Nutting and I had been procrastinating about installing oxygen in our plane but after the October 22 flights we have decided to go ahead with an installation immediately. All these flights have been with two persons aboard. In each wave flight the rotor was contacted at about 1500 ft ASL and the wave at 2000 ft ASL. By 2500 ft we shut down the engine and feather the prop. Lift has been up to 800 fpm with the wave cloud face frequently nearly vertical and the cloud 2000 - 3000 ft deep. On the 16,000 ft climb I was positioned about over Foothill College and needed only 65 - 70 mph to hold position. The second and third waves lay well defined over the Bay. I'm completely convinced that diamond altitude gain can be easily achieved and probably some diamond distances as well. The wave is well defined as far as the eye can see and a downwind and/or crosswind run towards Paso Robles or Bakersfield seems quite feasible.

To stay out of the San Francisco TCA we slide down toward Los Gatos, around the edge of the TCA and then back toward San Francisco once we have topped 8000 ft.

Since these waves precede the storm, we watch our window carefully and on two occasions have returned to Palo Alto in the rain.

While we have just begun to explore the Santa Cruz Mountains' soaring, Bill Nutting and I already both feel that we made a right choice with our RF-5B. It's a plane whose time has come. (Reprinted from December 1973 *West Wind*.)

THE DEVELOPMENT HISTORY OF THE MOTORGLIDER

by Hans Zacher, German Aeronautical Research Center, Munich, Germany.

Introduction by the translator: In Germany, winch launch is pretty much the mainstay of weekend and training (gliding school) activities. Aerotow is on the expensive side and out of reach for the small rural groups that form the backbone of the sport.

Hans Zacher distinguishes between Gleiter *and* Segler*—glider and sailplane —with or without motor, the difference being L/D performance below 25 and better than 25 respectively.*

This paper was presented at a symposium on aeronautical technology at Amsterdam, Holland, Nov. 1970.—Tasso Proppe

1. Preface:

Motorgliders have established themselves in Germany, and they are winning new friends in other countries as well. Motorgliders represent a category by themselves, officially recognized (not in the United States—Tr.). Licensing and certification is subject to government regulation. They are manufactured commercially in small production quantities. Suitable propulsion systems are now available.

The number of friends and supporters is steadily growing and, accordingly, the number of flight hours is increasing and so is the number of enjoyable "air hiking" flights. They are used to expand experience and to explore lift conditions. It is to be expected that this will be to great advantage for the future of pure soaring as well.

Wolf Hirth (the Dean of Soaring, Silver "C" No. 1) already very early promoted the idea of motorgliding in his "Handbook of Soaring'.

Motorgliders were built in the years around 1924 and later from 1936 to 41. The old idea was resumed after 1955 in Germany and in several other countries with new concepts. Without going too much into details, the following should represent a brief discussion of concepts and purpose of the motorglider, its development history and where we are today.

Purpose and Criteria: The purpose of the motorglider and the technical requirements are subject to opinion, and the opinion has changed with time. Even today, there is hardly a recognizable opinion commonly agreed upon by the friends of motorgliding as well as by the glider- and power-pilots. One school of thought promotes the self-launching motorglider as the only acceptable form whereas it is the opinion of others that the whole idea of soaring would call for an airplane that is depending on launch methods other than its own power to get airborne to be allowed the classification Motor*glider*. There are some that are opposed to this new concept completely.

Let's disregard any opinion and try to consider some of the opportunities the motorglider has to offer:

1. It can (generally) take off on its own power and therefore be independent from helpers and support equipment like winch, retrieving vehicles, towplane, etc. Therefore, it can be operated on weekdays outside the crowded weekend schedules where flight time is restricted to allow the waiting group members on the ground to put in some flight time, too.

On small airfields, it can still be launched by a winch (to shorten ground run).

2. It can seek out lift areas (clouds, waves, mountain ranges) not normally within reach of a winch launch.

3. On cross-country flights, it can negotiate larger areas of down-draft and thus make "air hiking" possible.

4. It is able to return to the base after a cross-country flight. During a competition, this return is generally not a problem, since vehicle and crew are on standby, but in the day-to-day training, this has proven to be rather cumbersome and slow.

5. The efficiency of instruction (in a dual motorglider) will be improved; we will discuss that later.

There are many more areas of application (for instance, research), but let this account suffice for now.

We have to clarify on the other hand, too, what a motorglider does *not* want to be.

a. It does not want to be an airplane for racing and travel—it does not want to be *fast*, but fly *slow!*

b. It does not want to compete with the sailplane. Therefore, it should not actually participate in soaring championships. There should probably be motorglider meets, but they should emphasize "air hiking".

c. It does not want to be a light or ultralight airplane, the engine of which is running continuously with a long ground run before getting airborne, poor performance and hence poor flight characteristics.

d. Neither does it want to be a means for "buzzing" relatives at low levels causing noise pollution.

The German LBA (equivalent to FAR) 10.05 explains the required performance and characteristics for certification of motorgliders. These "Preliminary Guidelines for Testing and Certification of Motorgliders" are rather generous and designed to promote the development. They allow for performance parameters below standards that would appear desirable for sport aviation.

The soaring pilot will be asking for performance similar to his sailplane, L/D approx 30, rate of sink 0.7 m/sec (= 140 ft/min) at a wing loading of 25 kg/m^2 (= 5.1 lbs/ft^2. That doesn't need a very powerful propulsion unit; 20 hp would suffice for a safe and reliable takeoff for single-seaters.

Those figures are pertaining to a performance motor-sailplane. One should not disregard the desirability of less expensive training motor *gliders*, single- and dual-seaters. The dual motorglider (moderate performance) in particular could impact the efficiency of instructing glider pilots. It offers the following advantages over the presently accepted dual training gliders:

1. It starts instruction at a much higher altitude than from winch launch; enables exploration of thermals, allows exercise of stalls and unusual atti-

tudes, and, of course, makes for longer flights where more can be learned.

2. It permits a better utilization of the equipment due to the possibility to continue instruction during the week without a large compliment of supporting personnel and machinery.

3. Transition from glider to power plane is easy, even a common basic instruction is possible.

4. Finally, it brings soaring within reach of all-family participation.

In conclusion, it must be stated: the objective of the technical effort is a powered *sailplane*, not an ultralight airplane. The latter has its place, too, as well as the motorized *glider* for practice and training.

2. Previous Developments.

After the first successes in soaring on the Wasserkuppe, an attempt was made (1924) to include motorized gliders and light powerplanes in the competition objectives. Some of the better known ones were: Strolch, Roter Vogel, Max, Kilibri, Karl der Grosse, and the Daimler L 15 with engines between 4 and 30 hp, some of them developed into successful sport aviation planes which owe their layout to the sailplanes—but the motorglider did *not* arrive.

Not until 1938 was the idea picked up again: at first by installing the newly developed Kroeber M 4 18 hp engine into existing proven gliders like the *Grunau Baby*, *Condor*, Mu 13 d. Then, in a refinement, two motorgliders evolved that, for the first time, deserved that classification. They were built in single copies which, even today, still represent a standard—but the war prevented them from establishing their real breakthrough: the C 10 of Hans Wuenscher, and the Hi 20 (*Mose*) of Wolf Hirth (Fig. 1 and 2).

The C 10 had an 18 hp Kroeber M 4 engine installed in the fuselage swinging a 1.68 m (5.5 ft) diameter folding propeller via a V-belt reduction drive. The prop rotated around a steel tube which served as empennage boom. The two copies built contained typical characteristics of motorgliders: a folding, large-diameter propeller with consequently low rpm, and a hidden propulsion plant. Somewhat later, and in a different way, the same characteristics were achieved by the Hi 20. The engine, also hidden in the fuselage, was driving the propeller atop a pylon via a bevel gear. The propeller and the pylon could be folded into the fuselage. For ground acceleration, the engine was coupled to drive the single wheel under the center of gravity.

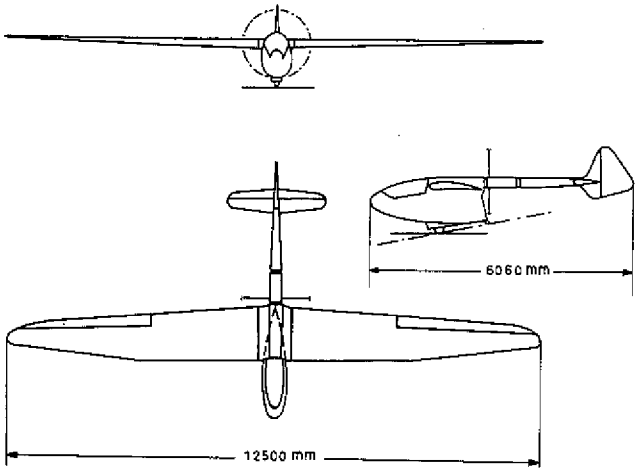


Figure 1. C 10 by Akaflieg Chemnitz 1940.

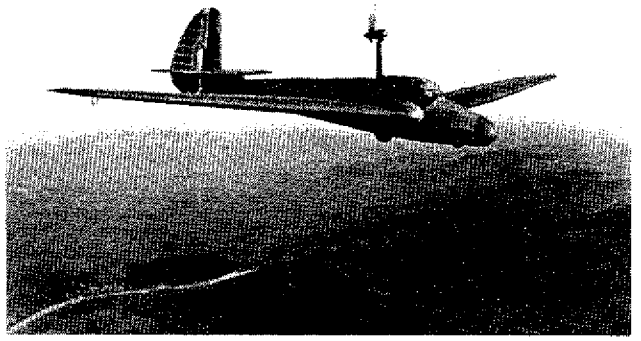


Figure 2. Hi 20 by Wolf Hirth, Nabern 1942.

3. Postwar Development.

When the construction of motorgliders was resumed around 1955, it again was an attempt to install engines into existing sailplanes with only little change to the structure. What ever motor-vehicle engines were suitable, or, if it happened to be available, an old low-power aircraft engine, was used.

Only very few dared to move into a new design of the motorglider, because the reliability of small powerplants around 20 hp was not established suffic-

iently. There were still some copies of the French AVA (some 20 hp) and of the German Kroeber M 4 (18 hp) left. The VW engine had proven itself in ultralight planes, but motorgliders only used it for prototypes and abandoned it later because of its weight. More recently, its modifications as Rectimo and Stamo engines became more suitable.

Ilo, Lloyd, Pollmann, and Braendl engines appeared in low-production numbers, but the commercial production of motorgliders did not become economically feasible until the appearance of the light 26-hp two-stroke engine of Solo-Hirth on the market in reasonable production numbers.

The Wankel engine—so far in low power versions only—is about to be introduced.

A little turbo jet (BMW 8026) with, according to the manufacturer's information, 45 kg (100 lb) thrust at 38 kg (84 lb) weight was unsuccessful as a propulsion plant for several reasons; much as the installation appears to be ideal, it remains to be seen how far the advantages of the installation (no disturbance of the aerodynamic shape) will be offset by the high initial cost, the high fuel consumption, and the noise pollution. Another design feature would be the absence of problems related to propeller ground clearance.

In addition to the power plant, a discussion of propeller and starter devices is required. If one does not choose a completely hidden propeller, a folding prop is still a good choice. The same holds for a two-position-pitch prop with a feathering feature. A normal, fixed-pitch prop is at a considerable disadvantage, but it is still pretty much in use because of its simplicity.

For air restart, an electric motor has been selected quite frequently; it weighs with its battery some 20 kg (44 lb).

In more recent developments, a manual (recoil) starting device has been used quite successfully with engines of good start characteristics. Air start reliability is more important to the acceptance of motorgliders than weight, fuel consumption, or low-wear characteristics. Of 1000 to 2000 flight hours, the engine is actually supposed to run only 100 hours—if the idea of *soaring* is to be adhered to. However, if you need it, the engine should respond instantly.

The dual-seaters that existed at the beginning of the development, evolved with stronger engines into sport aviation airplanes (RW 3, *Motorraab*, *Elster*). The first single-seaters with 12 hp or less disappeared because they could not take off on their own power but had to use the winch to get airborne. There may be a comeback in that category. The real survivers are the single-seaters with 25 hp which satisfy the takeoff roll distance requirement. It must be admitted that they do not yet represent the ideal of a motorglider that the C 10 and the Hi 20 came so close to.

The recent availability of more reliable engines in the required power class will offer a challenge to pursue further development. This development is already being outlined by the SF-27 M or the AS-K 14—but a number of problems still have to be solved.

The motorgliders that are presently in production are already the avant-garde for the concept of "air-hiking" that Wolf Hirth devoted so many a line to.

Outside Germany, some remarkable motorgliders were built, too. In Austria a Steyr-Puch engine was installed into the *Kraehe* (Hey, that's my bird—the translator); in the USA, Ted Nelson built his *Hummingbird* in several copies: a dual-seater with fold-away power plant. Other examples are: *Hawk 3* (W. Haufe) with folding propeller; Prue 215 A (M. Dreher), *Cherokee II* (K. Flaglor) and HP 12 (R. Schreder)—the latter two with go-cart engines.

In the USSR, the Antonov A 13 was developed, in Rumania the IS 9 by Silimon, in Czechoslovakia the Blanik XL 13 M by the Prague Aeroclub, and a single-seater by Stibor.

In England, the Capstan T 49 was motorized, and in Italy, A. Matelli applied himself to the idea of motorgliders with AM 6, AM 12 and the cvv 6 Canuro Pallas. France, too, contributed to a considerable degree with Ch. Fauvel's tailless AV 45 and AV 221 and the development of a small engine.

This presentation is too short to be able to mention all the names and details.

Much of this development goes on with little fanfare in seclusion.

4. The Prospect and Outlook of the Future.

Hull problems did not contribute to the failure of motorgliders to make it. It was always the engine. But the development *is* making progress, however slowly.

Everything is left to private initiative. There is no sponsor—there is even a suppressive tendency from the part of officialdom.

New possibilities are taking shape (the Wankel rotary-engine, ducted fans, fiberglass technology) and new questions are being raised: the recognition of soaring records flown on motorgliders, participation in competitions, conditions of badges, evaluation formulas considering engine running time, fuel consumption, and speed.

But there is no definition established yet as to what really is "soaring" and what is a motorglider. What are the limitations for size, weight, engine power, rate of sink, and gliding angle. Who decides on the differentiation between motorgliders and ultralight airplanes, and between those two on one hand and motorized sailplanes on the other.

No matter what shape the future motorglider finally will assume—that of a C 10 or the Hi 20, the MS 60 or the H 30 TS, the SF-27M or the AS-K 14—it always has to be a good sailplane with a reliable, easy-to-start power plant.

Motorgliding and "air hiking" will always be: as much *soaring* as possible.

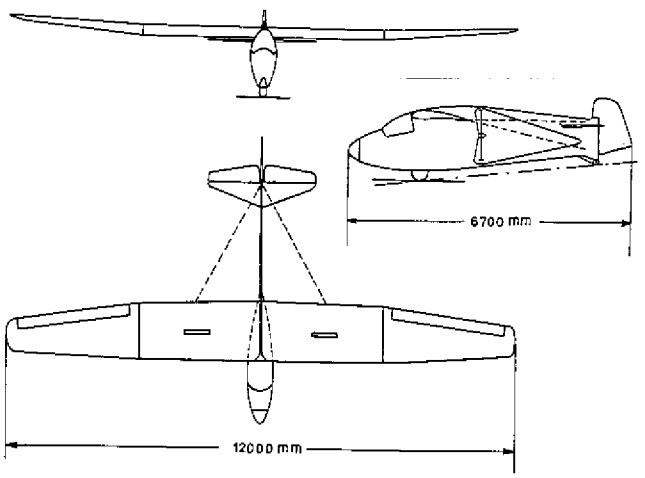


Figure 3. *Kraehe* by Raab, Munich 1957.

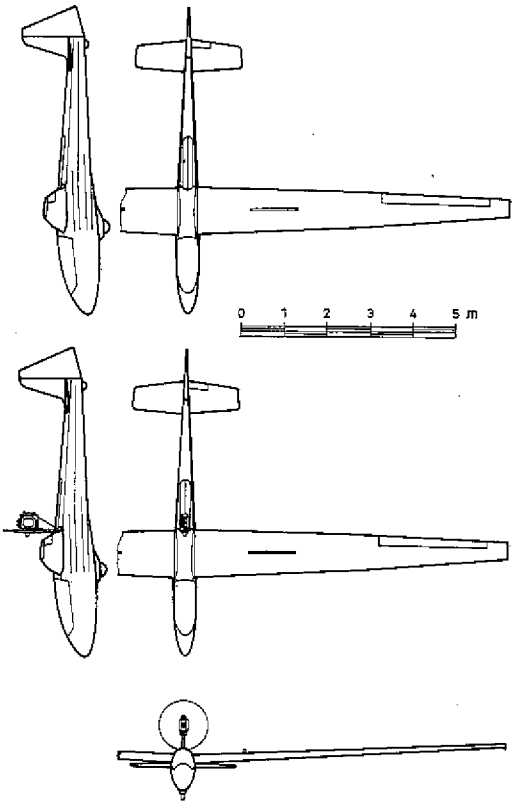


Figure 4. SF-27M, by E. Scheibe, 1966.

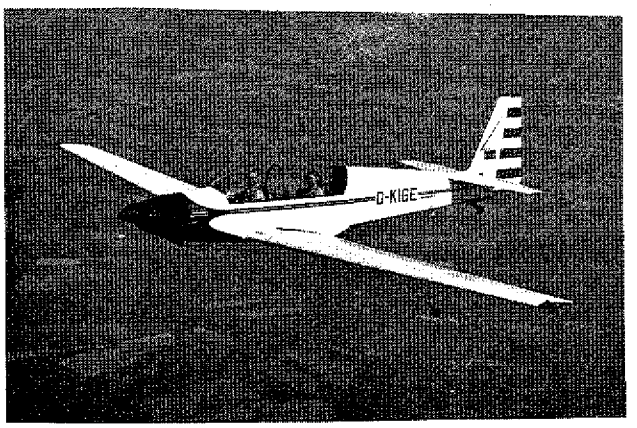


Figure 5. RF-5, by A. Putzer, 1968.

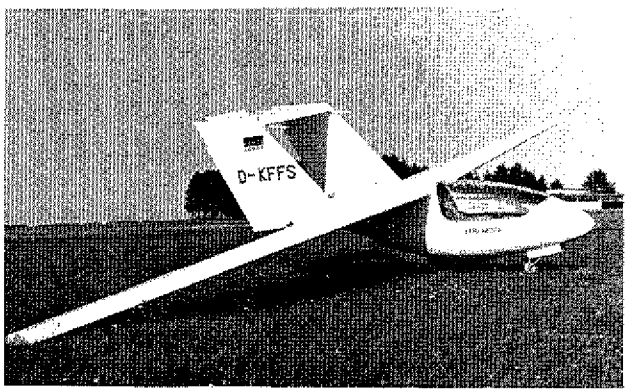


Figure 6. fs-26, by R. Eppler, 1971.

FOREIGN SCENE

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

The March 1972 issue of the French *Aviasport* has an interesting article about the three most popular tailless designs by the well known designer Charles Fauvel. The article is composed of excerpts from letters by the designer. A summary is presented here.

AV-361 *Mouette (Seagull)*

This performing single-place sailplane replaced the AV-36 some ten years ago. Substantial modifications and improvements were made during this period; it is being built in many countries, including America, by homebuilders. The glide ratio of the AV-361 was increased to 26+, as compared to 24 for the AV-36; likewise the penetration was improved. Other technical data are:

Span	42	ft
Wing area	157	ft^2
Aspect ratio	11.4	
Empty weight	275	lb
Gross weight	567	lb
Min. sink	2.4	ft/sec

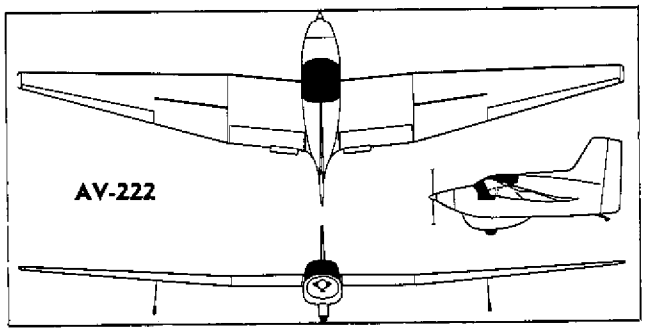
AV-45 *Faucon (Falcon)*

A single-seater auxiliary-powered sailplane, of which two were built and test-flown in '68 and '71 by two homebuilders. One has the Nelson engine (single ignition) with electric starter, the other features the German Solo power plant. The front cover of November 1971 *Motorgliding* shows this APS in flight. Some technical data:

Span	45	ft
Wing area	172	ft^2
Aspect ratio	11.84	
Empty weight	475	lb
Gross weight	770	lb
Glide ratio	27	
Min. sink	2.6	ft/sec

AV-222 *Buse (Hawk)*

This two-place auxiliary-powered sailplane is a version of the well known AV-211. The *Hawk* has a three-panel wing instead of the (usual) two panels of the AV-211 to facilitate the construction as well as to simplify the panel attach fittings. As shown on the three-view sketch the central panel is straight; the dihedral is provided by the outer panels. This APS was featured on the back cover of May 1971 *Motorgliding*.

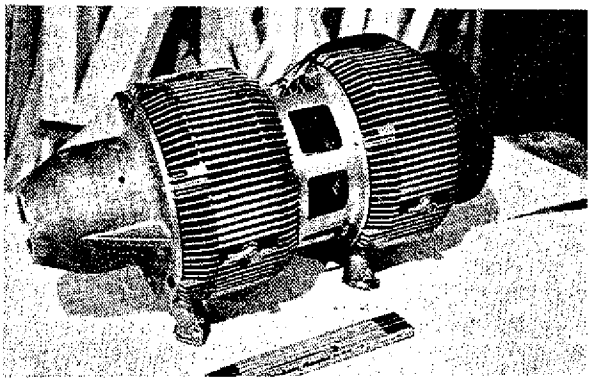


Span	54	ft
Wing area	248	ft^2
Aspect ratio	12	
Empty weight	715	lb
Gross weight	1210	lb
Glide ratio	26	
at	53	mph
Min. sink	2.85	ft/sec
at	46	mph
Rate of climb	590	fpm

The above information is based on the perennially hypothetical engine DeCoucy "Pygmee II" of 55 hp at 5500 rpm (2750 rpm at the propeller). However, it should be noted that the prototype AV-221 flew with a VW-Rectimo 1200 engine (39 hp) and that those built by many homebuilders in various countries may have the VW 1600 engine (60 hp at 3600 rpm). Detailed plans for the three previously mentioned designs are available from the designer Charles Fauvel for F 400, 700 and 800, respectively (F1 approx. $.22). (Address: 72, Boulevard Carnot, Cannes, France.)

WANKEL ENGINE for Auxiliary-Powered Sailplane. This is the title of a small article in October 1973 *Aviasport*. The translation is given here.

Fichtel & Sachs, the manufacturers of small Wankel engines in Germany, has developed a new engine by coupling two rotor units of 24 hp each. This engine, KM-914, develops 47 hp at 5000 rpm with a maximum torque of 51.4 ft-lb at 4000 rpm. With a 1:2 reduction unit the overall length is 24.3", diameter, 8.2" and the weight is 99 lb.



The first installation will be in the German auxiliary-powered sailplane D-39 of the Darmstadt College soaring group (see *Motorgliding*, June 1973). This APS was originally designed with a Hirth 017 snowmobile engine developing 36 hp.

The calculated performance of this Standard Class D-39 with KM-914 Wankel engine is:

Glide ratio	37		
at	65	mph	Propeller
Min. sink	1.97	ft/sec	folded
at	56	mph	
Empty weight	615	lb	
Gross weight	880	lb	(incl. 10 gallons of fuel)
Wing loading	7.4	psf	

A few words of caution to Wankel engine enthusiasts: Spurred by an advertisement last April in the Wall Street Journal *by the American distributor of small Wankel engines, AMTECH SERVICES inquired about and received the following information concerning three engines:*

KM 24 snowmobile engine (294 cc, 23 hp, 46 lb excluding accessories, $385)
KM 48 generator type engine (160 cc, 8 hp, 44 lb, including accessories, $470)
KM 914A engine (300 cc, 16 hp, 70.5 lb, including accessories, $682)

Obviously none suitable for our performing "Jenko APS II" under development (see Jan/Feb '72 Motorgliding, *p. 15).*

Then, based on the Aerokurier *article (see our translation in "Foreign Scene", October 1973* Motorgliding*) we inquired again. The distributor's investigation produced the reply that other than the previously-mentioned engines are strictly "experimental" and may never reach production. Our further efforts to explore the situation here (e.g., Outboard Marine Corp. manufactures a 35 hp Wankel snowmobile engine under license for* their *snowmobiles) show that there is no hope at present for a 25 to 35 hp engine of reasonable weight due to the very strict licensing agreements. Thus the only hope may be the Fichtel-Sachs Co. if they ever decide to get one of their "experimental" engines in production.*

We intend to write an article on this thorny matter of suitable engines for APSs in the near future.

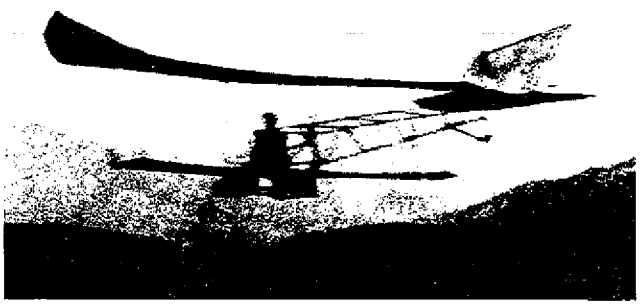
WHAT, a "MOTORGLIDER" in 1913?

A very interesting article about gliding BEFORE WW I appeared in September 1973 German *Aerokurier* magazine. It shows that auxiliary-powered gliders are as old as gliding itself (purists, don't get panicky!) So, those readers who some 60 years ago were indulging in wishful thinking or even building a"motorglider" may find these few lines of substantial sentimental stimulation, proving once again that you were not alone at all!

Although the beginning of gliding and soaring is generally credited to the 1st Gliding Contest at Wasserkuppe (Germany) in 1920 gliding rallies in prior years are less known.

The summary of the article is presented here:

The 2nd Glider Rally took place in 1912 at Wasserkuppe. Many participants were high school students from Darmstadt. One of the best gliders was a surprisingly "clean" biplane FSV-X (see illustration).

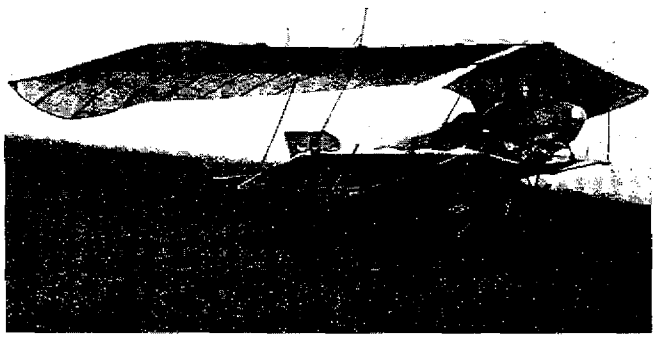


One of the students, Hans Gutermuth, flew a record 2700 feet in 1 minute 52 seconds. In view of their very successful 2nd Glider Rally plans were made by

the high school students to build a new "light weight" motorglider with a 25 to 30 hp engine. (It must be a "magic number" surviving all the years of frustration).

However, this enthusiastic goal appeared to be beyond the reach of the high school student glider group. Although a new glider, most likely designated FSV-XI and resembling the proven FSV-X, was built during the winter of 1912/13 there was neither money for the engine nor the time left for its installation in order to attend the 3rd Glider Rally.

Not much is known about the 3rd Glider Rally. However, the first motorglider without the engine flew during the meet, although the anticipated performance did not materialize.



With exception of a few photographs little other information is available. It appeared that the glider was built too heavily. Some of its features like streamlined, plywood covered fuselage paved the way for future sailplane design conceptions.

The previously successful glider FSV-X did not show up and the 3rd Glider Rally in 1913, in spite of much expectations, especially about the first motorglider (FSV-XI), was without any marked events and left behind hardly any information.

In view of the fact until a few years ago no reliable, lightweight engines existed, one wonders just what kind of an engine those high school students had in mind. By the mid '30's, when this writer followed their footsteps (with similar, crazy ideas, some of which later on became standards in soaring) no such engines existed, except the notorious motocycle engines. By the late '30's two surprisingly well-designed two-cycle, two-cylinder engines (one German, one French) appeared. But then, the rumblings of WW II stopped everything.

One wonders what the high school students are doing today besides playing ball and getting high—on drugs.

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WANTED: TWO-PLACE used motorglider. Hugh Currin, 2029 LeRoy St., Klamath Falls, Oregon 97601. (503) 884-9988.

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Here's Henderson

by Dick Henderson

An aircraft that would seem to have possible potential as a motorglider is the Rand KR-1. The designer, Ken Rand, was contacted about using the KR-1 as a basic design. He gave the idea his wholehearted support, having had such a plan in mind for some time. Mr. Rand suggested the addition of 18-ft outer panels to replace the 5-1/2 ft panels in the original drawings, using the same construction techniques and rib spacing. The long-wing design would require the addition of spoilers.

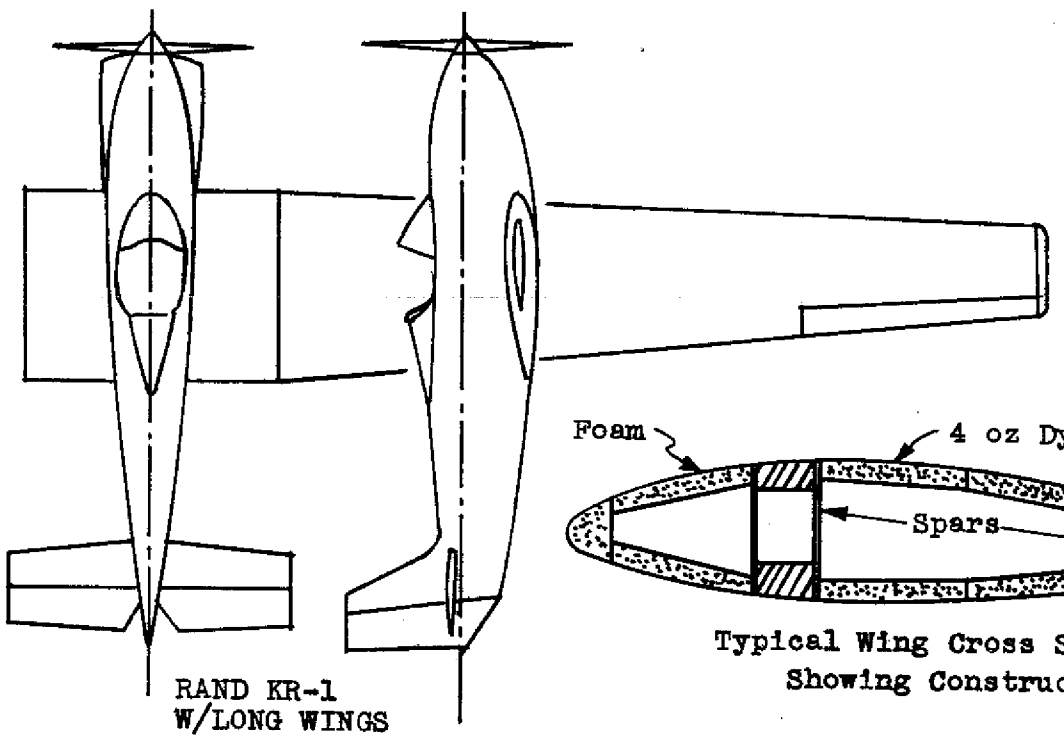
The addition of a Revmaster starting system and carburetor was suggested for air starts and better engine induction reliability.

The design of the KR-1 indicates simplicity and ruggedness and has won the Pazmany second-place award for efficiency at the EAA fly-in at Oshkosh, Wisconsin in 1973. A KR-1 built in Anchorage, Alaska, also at the fly-in, was observed to have an incredibly smooth finish equaled only by finished of the finest glass sailplanes. This finish technique is outlined in the KR-1 construction booklet.

Mr. Rand claims the wing carry-through center section is stressed for plus or minus 20 G's with the short wings and still retains a plus or minus of 4 G's with the long wings. He says the aircraft requires no changes in moment arm length or tail surface areas.

The KR-1 is a single-place 36 hp VW-powered low-wing monoplane with two-wheel retractable main gear. The wing is a two spar built of spruce and plywood with removable outer panels. The wing has a minimum of plywood ribs to hold the spars in position and form the airfoil till foam is glued in place and shaped to the plywood ribs. The fuselage is a basic box form and has foam added for contour. To the wing and fuselage is added Dynel fiber cloth and epoxy resin. The whole aircraft weighs 310 pounds empty and cruises at 130 mph. The KR-1 has flown 170 mph in test runs.

Information on the KR-1 may be obtained from Rand-Robinson Engineering, Inc., 6171 Cornell Drive, Huntington Beach, California 92647. Info packet $2.00, plans $25.00.



RAND KR-1
W/LONG WINGS

Typical Wing Cross Section
Showing Construction

BURG FEUERSTEIN '73—a reply to Landon Cullum, Jr., and an invitation for the next motorgliding contest there.

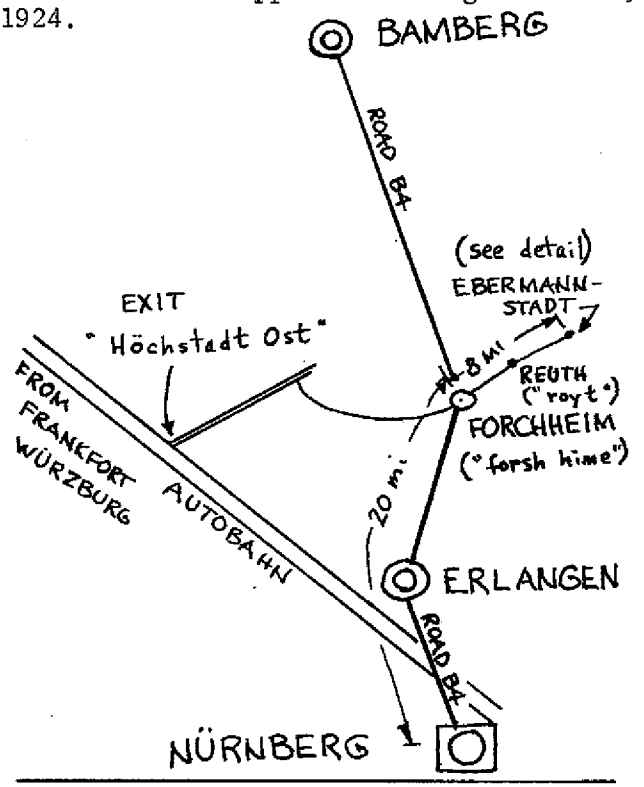
by Peter Riedel

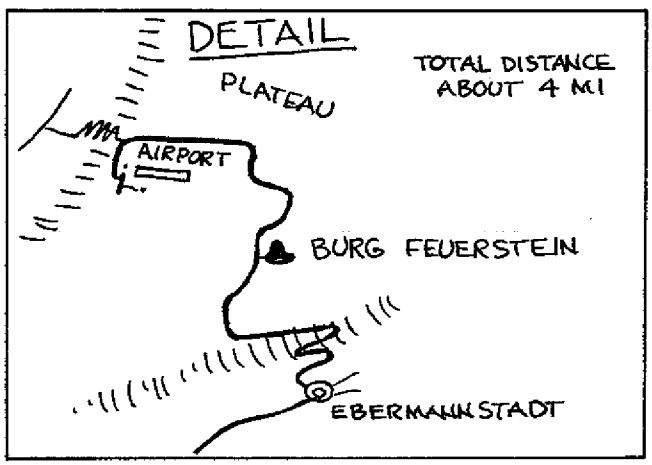
Unfortunately I discovered your report about your visit to the 1973 motorgliding contest on Burg Feuerstein airport a short time ago only. If this reply is published soon it might assist visitors from abroad to find their way to Feuerstein and to English-speaking people there in a more satisfying way than reported by our soaring brother Landon Cullum, Jr. in the July 1973 edition of *Motorgliding*, pages 7 to 9.

For your information, my dear Mr. Cullum, Jr., I was present during the entire motorgliding contest on Burg Feuerstein for the express purpose to take care of non-German speaking visitors. It seems that you just strolled around the airport without dropping in at the "Information" room where the directors of the meeting had their headquarters. Did you see the tower? Big enough and close to the center of all activities, the information room was at its ground level. Many other visitors from other countries found their way to this room, where always somebody was on duty to take care of visitors, of the press and of telephone calls. I took guests from Finland, Japan, Sweden, and the United Statesaround the field. You could have been one of them. If I would not be there in the future, there would be others capable of assisting non-German speaking people. Herr Hans Zacher (pronounced "Tsacher") speaks English and he is one of the main driving forces behind the motorgliding movement. He will always be one of the directors of motorgliding contests here in West Germany.

Finding Burg Feuerstein by road is rather difficult, but with my map in hand driving time from Nuremberg to the Burg Feuerstein airport should be reduced to about 45 minutes from your indicated one hour and a half. My estimate would include stops for asking at gas stations or looking at road signs. It is certainly best to first head for Forchheim ("forshhime") instead of trying to find slightly shorter routes through villages with difficult names and suddenly offbranching roads. I would recommend the return trip to highway B-4 via these shortcuts, since it is always easier to find a main road, even if you would loose your way.

Welcome to the 5th German motorgliding contest on Burg Feuerstein from June 8-16, 1974! It will celebrate the 50th Anniversary of the very first motorgliding contest in Germany which took place on the Wasserkuppe from August 10-31, 1924.





Tip: Road to Burg Feuerstein branches off right after the first gas station to the left, at the very outskirts of Ebermannstadt. The road starts climbing right away. Nurnberg (Nuremberg) to Forchheim is 20 miles on Road B4.

LETTERS

More response to the FAA concerning the upcoming NPRM on motorglider certification:

Dear Mr. Baker:

The article on page 3 of the magazine *Motorgliding* is indirectly dedicated to the FAA—so I am submitting an official copy, just in case you haven't seen it already.

I am also including a list of my "credentials", and I should add that I am now 63 years old and flying the motorglider *Kraehe* in the southern California area; pictures and descriptive material in other issues of *Motorgliding* (March, May).

I was always involved in pioneering new concepts of aeronautical advancement. But I have the unpleasant feeling that time is running out on me.

I am firmly convinced that motorgliding will eventually replace the already outmoded (let's face it) methods of aerotow—and I wanted to be a part of this development. I did not believe that the reluctance from the part of the FAA to recognize this category would paralyze its development to such a degree in this country; now, after nearly two years of effort, I am rather discouraged. I am running out of financial maneuverability and elbowroom.

However, I predict: Motorgliding will be the soaring sport of the future.

Through motorgliding, soaring will be accessible to a large segment of the population. (Today, in this country, it is a sport for the very dedicated and the rich only.)

The American Curiosity which has already experienced the water (sailing, motorboating, waterskiing, skin diving, underwater photography), the desert (dune buggies, motorbike), the mountains (hiking, camping), will sooner or later reach for the air, too. The pressure is already there: the hang gliders. They will soon spill over into motorgliding (not aerotowing high-performance sailplanes), simple, fiberglass-plastic machines with snowmobile engines, and the desert will be populated with them, taking off from dirt roads.

If you are not prepared for it, that is, if you are not recognizing that pressure and responding to it, it will be the same disaster as the Citizen Band ("too little and too late") of the FCC.

I think, I will be too old by then to help guiding this new technological baby to sense and safety, as I did in the past.

My advice: Create the category Motorglider—you have already a considerable amount of precedence in Europe. Allow the gliding schools and enterprises to operate dual motorgliders for training purposes, so that people can learn to fly (soaring!) in a controlled manner and have some safety consideration engraved into them. And hope for the best.

Tasso Proppe
Lemon Grove, California

Editor:

Please extend my compliments to Michael Machat for the rendering of my motorglider, *Oryx* which appears on the cover of *Motorgliding* for December, 1973. Considering that he had only a three-view with which to work, plus a couple of small photos in *Sport Aviation*, he did remarkably well.

The only fault I could find with the presentation was on the three-view itself. The typist undoubtedly read the wing area properly, but punched the wrong key. The area is 177 square feet, not 117. No problem.

In spite of *Motorgliding's* admonishment to the contrary, I am receiving a considerable number of inquiries about the machine. I'm glad that people are interested. These inquiries are, of course, being fully answered as a very busy schedule permits.

I estimate the construction to be about 70 percent complete at this time. However, progress during the past few months has been much slower than I had hoped. It always seems to work out that way, doesn't it, with all of us?

I don't recommend that anyone wait for the plans because they are still probably 1½ to 2 years away. I am building

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to layout drawings and sketches and, since they are incomplete both in coverage and accuracy, no one but I can understand them (and sometimes even I have trouble with them!). Consequently, a whole new, expanded set of drawings will have to be made following flight test. And, as any designer can attest, this will be a real timeburner.

Anyway, by the time I get the aircraft completed there probably won't be enough gas around with which to fly it. Maybe we should all go hang gliding!

Stan Hall
Sunnyvale, California