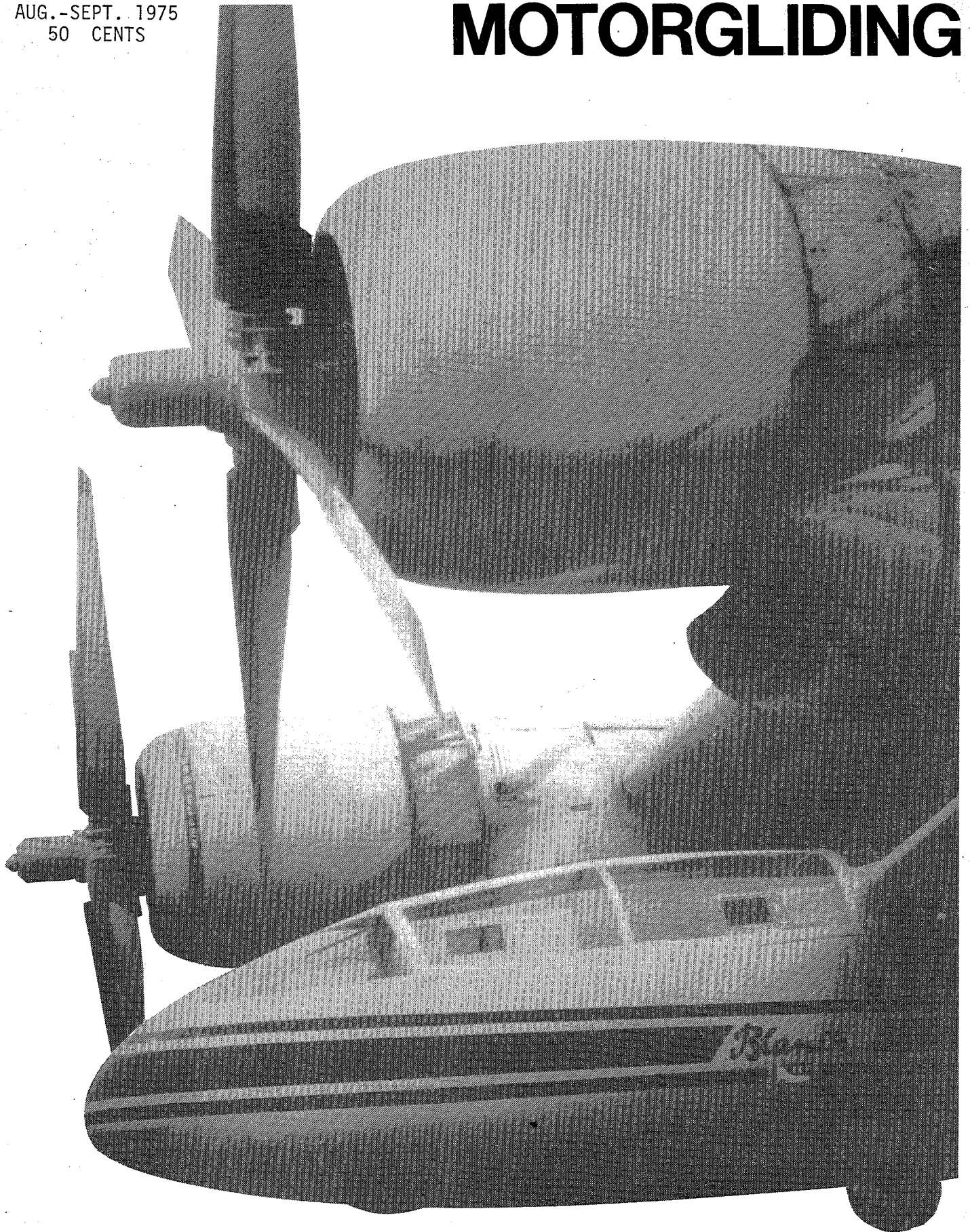


AUG.-SEPT. 1975
50 CENTS

MOTORGLIDING



BEST OF BOTH WORLDS.

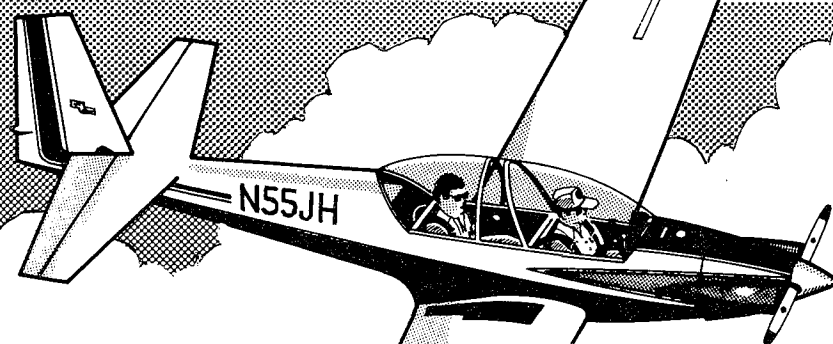
ENGINE: SPORTAVIA-LIMBACH SL 1700 E
68 hp AT 3,600 rpm

SPAN: 55.9 FT.

LENGTH: 25.3 FT.

EMPTY WT.: 1,012 LBS.

T.O. WEIGHT: 1,500 LBS. LBS.



THE SPORTAVIA

RF-5B

Sperber

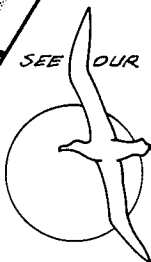
4 GAL/HR FUEL CONSUMPTION
250 ST. MI. RANGE @ CRUISE
43 MPH. STALL SPEED
143 MPH. MAX DIVE
100 MPH. CRUISE
9.8 FT/SEC CLIMB
18,000 FT CEILING

GLIDE PERFORMANCE

2.5 FT/SEC. SINK SPEED (1 PLACE)
3.1 FT/SEC. SINK SPEED (2 PLACE)
26:1 BEST L/D

SEE OUR MARCH '75 "SOARING" CENTERSPREAD AND
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MOTORGLIDING

Donald P. Monroe, Editor

Vol. 5, No. 1 Published by The Soaring Society of America, Inc. Aug.-Sept. 1975

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Circulation of the August 1974 issue was 950. This issue was mailed in August 1975.

SSA-FAA MEETING, HARRIS HILL, ELMIRA, N.Y.

By B. S. Smith, Chairman SSA Publications Board

Motorgliding has been approved! The regulations have been adopted for a new category. This is what we heard at the meeting. Unfortunately for United States motorgliding enthusiasts, they were words from Canada, not from the FAA. We congratulate our northern neighbors on their success. Will our FAA ever move? We did have a full day's meeting with the following people in attendance:

Paul Schweizer - SAC
Floyd Sweet - SSA
Ernie Schweizer - SAC
Sam Francis - SSA
Les Schweizer - SAC
Elemer Balint - Canada
Stuart Schweizer - SAC
Bernald Smith - SSA
Jim Nash-Webber - SSA
S. O. Jenko - Amtech
John Varoli - FAA
Bernard Grochal - FAA
Lauren D. Basham - FAA
Theodore W. Robinson - FAA
Mervin K. Strickler - FAA
David B. Thurston - SAC

Discussion encompassed the rewrite of FAA regulations concerning gliders and motorgliding. The progress report as far as the FAA was concerned was nil. Nothing has gone to legal review which is one of the necessary steps prior to an official notice of proposed rule making (NPRM). The FAA officials in attendance expressed embarrassment over the lack of progress and explained that gliders were low on the FAA priority list for action. As we understand it, there is an FAA individual responsible for general aviation under whom the activity moves. It was noted that there were a number of more important matters he had ahead of us such as resolving the decision on placing general aviation aircraft registration numbers under the wing or on the fuselage or tail. Those of you familiar with this will gain a quick insight as to just where we stand in the hierarchy of FAA!

The material that the FAA had prepared was a hefty document which encompassed all the various inputs and FAA thinking up to this point. The particulars concerning motorgliding were essentially unchanged from those discussed previously. I won't go into it here in

detail again. We've discussed it back and forth; how much fuel, single/double ignition, glide ratios, all of these matters. Still, we are seemingly no further along than we ever were on having a U.S. category for motorgliders. I guess the newest matter this time was the suggestion that there be two categories of motorgliding, one with a fuel limit and one with no fuel limit. Those with no fuel limit would probably be categorized as airplanes.

For whatever it's worth, my personal opinion is that we've just had another slowdown in passing the buck by the FAA. The main result of the meeting was the FAA asked SSA to submit a complete document on the needed regulations. They are saying that they need someone else to do the work; they can't do it and I guess they feel that what they have developed so far can't be implemented in its present form. Review of present material will be made under the guidance of the SSA Technical Board and changes developed thereto with the whole thing resubmitted to FAA requesting immediate rulemaking. Here we go again!

Probably one of the major slowdowns is the inclusion of motorgliding rulemaking in the complete rewrite of the glider criteria handbook that FAA is undertaking. This will develop complete certification requirements for gliders and motorgliders as well as what we want in order to be able to license and fly in standard category under reciprocal agreement and fly therein. The FAA can't see their way to a motorgliding category without rulemaking similar to Part 23/33. Contrast this to what's just occurred in Canada.

We were pleased to see the success the Canadians have had. They now have regulations covering operations for motorgliders; see this report's appendix. Note that they have no provision for original type certification of motorgliders in Canada. They will give type approval to those licenses in other countries which meet their new requirements. It was explained to me that ships so licensed could be used in regular commercial operations. I think the approach they've taken is quite interesting. We are most indebted to Mr. Balint (who was at the meeting) for the tremendous effort by him and other Canadians in getting these regulations through for Canada. It will have an impact on our FAA for the U.S. stands alone now in the glider world in lacking motorgliding regulations. Balint indicated that it took about three years from the time they began an intensive

effort until the final adoption of the regulations by the authorities.

Regarding the new Canadian rules, it's important to understand their pilot licensing is done on a "superior" basis. This means a pilot with a power license is qualified to fly gliders and balloons, but a pilot with a balloon license can fly only balloons. Therefore, the appended regulations are for those pilots with only glider licenses who want to fly motorgliders. A pilot who already has a power license needs nothing further to fly a motorglider. This is a significant difference from U.S. regulations where we require licensing of the pilot in each category. My personal feeling is that I would not like to see power pilots flying motorgliders who were untrained in soaring.

Some other points in the new Canadian rules to note:

Reasonable changes from FAI code are: landing L/D - 8:1 @ $1.4V_S$ instead of 7:1 @ $1.3V_S$; stall speed - 80 km/hr vs 75 km/hr; Max wt - 900 kg vs 750 kg; and they've included power loading which needs explanation: The maximum power allowed is 1 hp per 20 pounds weight. It's reversed from our power loading terminology. This means a 1400-pound motorglider could not have *more* than a 70 hp engine! The requirement for completing private pilot license exam means the written exam only, not the flight check. Finally, note that a glider pilot, to fly motorgliders unrestricted beyond 25 miles from his field, must have 45 hours *motorglider* time! The Canadians weren't too happy with that one. But, at least they've got something to work with.

Where will the U.S. be a year from now?

APPENDIX: NEW CANADIAN REQUIREMENTS FOR POWERED GLIDERS

1. Amend Air Navigation Order, Series II, No. 1 to include powered gliders as a sub-classification of powered aircraft.

2. For inclusion in this subclassification the powered glider must meet the following requirements:

a. Glide ratio (without the use of spoilers or other landing configuration devices)—not less than 20:1;

b. glide ratio (in landing configuration)—not greater than 8:1 at $1.4V_S$;

c. stall speed (V_S landing configuration)—not to exceed 45 knots (80 km/hr);

d. takeoff weight—not greater than 1985 pounds (900 kg);

e. maximum seats—2;

f. takeoff distance—not greater than 600 meters to 15 meters from smooth, dry concrete at maximum permissible takeoff weight and under standard conditions at sea level;

g. rate of climb—not less than 300 meters in 4 minutes at maximum permissible takeoff weight under standard conditions and in takeoff configuration at sea level; and

h. maximum power loading—not greater than 1 hp per 20 pounds maximum permissible takeoff weight.

3. Require an endorsement to a glider pilot license for each type of powered glider to be operated.

4. For the initial endorsement of a powered glider, the pilot must have:

a. satisfactorily completed the private pilot (aeroplane) license examinations;

b. acquired not less than 15 hours flight time in gliders or powered gliders including not less than 5 hours in powered gliders. The flight time in powered gliders shall include not less than 1 hour solo flight time and at least 10 takeoffs, 10 landings and 10 air starts; and

c. submitted a satisfactory recommendation from a qualified gliding instructor who is endorsed for instructing on powered gliders.

5. For subsequent endorsement of a powered glider, the pilot must have completed not less than 1 hour flight time in the type of powered glider to be endorsed on the license including one flight as sole occupant of the glider, and submitted a satisfactory recommendation from a qualified glider instructor.

6. Prior to exercising the privileges of an instructor rating in powered gliders,

the holder of a valid glider pilot license and valid glider instructor rating must have:

- a. acquired not less than 10 hours flight time in powered gliders including not less than 20 takeoffs, 20 landings and 20 air starts except that the experience may be reduced by one half if the applicant holds an aeroplane license; and
- b. submitted a satisfactory recommendation from a qualified glider instructor who is endorsed for instruction on powered gliders.

7. Except as provided for in a. and b. of this paragraph, powered gliders will be restricted to a radius of 25 nautical miles from a recognized glider training unit and must not enter any portion thereof which is designated as a control zone. For unrestricted flight:

- a. a powered glider shall be equipped as other aircraft with no waiver of requirements respecting instruments, emergency locator transmitters, radio, etc., and
- b. the pilot shall have acquired, in powered gliders, not less than 45 hours flight time which shall include solo, dual and cross-country flight time requirements similar to those required for the issue of a Private Pilot License (aeroplanes).

Certification Policy

We anticipate that European airworthiness authorities will adopt common standards for powered gliders and that the FAA will also issue standards for such aircraft in due course. We also plan to adopt or develop standards to give ourselves the option of type approving aircraft, as well as issuing flight permits to aircraft that are eligible to be classified as powered gliders. However, we have had no approaches from industry on this matter and, therefore, we feel that the introduction of such a policy would be premature at this time and that the interim policy discussed below will be adequate to permit the importation of foreign powered gliders pending our development or adoption of airworthiness standards.

a. Type Approval of Prototype and Imported Gliders

We will issue a type approval and consequently a Certificate of Airworthiness to any aircraft that is shown to comply with the requirements specified in this letter and also with the applicable Canadian regulations for prototype or imported aeroplanes in accordance with Part I, Sections 2.1 and 2.10 of the Engineering and Inspection Manual.

b. Flight Authorization of Other Imported Powered Gliders

We will issue a Flight Permit (Private) to an imported powered glider under the conditions stated in paragraphs 2 and 3 of our letter, reference 5010-10-301 (CAER) dated February 9, 1972. Paragraph 2 states "a powered glider shall be eligible for a Flight Permit (Private), provided that it is the subject of an acceptable Certificate of Airworthiness for Export both from the State of manufacture and from the most recent State of registry (if different from the State of manufacture)".

With reference to paragraph 3 of our letter we would appreciate the co-operation of your Technical Committee in providing us with evaluations of the first example of each type and model of powered gliders imported into Canada. Such evaluations should be supported by sufficient documentation and should include a recommendation on whether a Flight Permit (Private) should be issued with respect to that particular aircraft and other aircraft of the same type and model, subject to satisfactory condition.

c. Flight Authorization of Amateur-Built Powered Gliders

We will issue a Flight Permit (Ultra-Light) to an amateur-built powered glider for which compliance can be shown with the requirements for ultra-light, amateur-built aircraft, as issued in N-AME-AO 40/74, pending publication in Part II, Section 1.8 of the Engineering and Inspection Manual. You should note that the concession in the revised requirements to permit the importation of an amateur-built aircraft is extended only to a Canadian citizen or "landed immigrant" who built the aircraft himself.

AS-K 14 ELECTRIC ENGINE STARTERS

by Walter Buhl

Having been exposed, during the 1974 International Motorglider Meet, to motorgliders with electric engine starters, Bob Tawse and I came home convinced that this was something we ought to have on our AS-K 14's. This conviction was partly due to envy as we saw how effortless life could be but mostly due to a bitter day straining our guts with a strange engine as we qualified for our German motorglider licenses.

About the time I got around to ordering the parts the Hirth Company decided to go out of business. A call to Hirth Motors of North America in Detroit located two ring gears. I found a starter motor at a snowmobile dealer. Imported Motors Inc. of Buffalo had another starter and I also bought a generator coil for the magneto. At Burg Feuerstein I had seen and photographed the installation in the AS-K 14 flown by Hermann Michel. A letter to Rudolf Kaiser, the AS-K 14 designer, got me a set of drawings from Alexander Schleicher Segelflugzeugbau. These are somewhat sketchy and Kaiser added notes like "cut to fit" and other hints. This is due to the fact that the engine crankcases, being sand castings, are not alike. The Schleicher installation has been accepted by the German Civil Aviation Authority (Luftfahrt Bundesamt).

There is nothing that has to be done in the way of filing clearances on the crankcase that cannot be done by hand or with a power hand tool, but it is a lot of hard work. For the two engines I worked on, it was a lot less work and quicker to put the whole engine on the table of a big boring mill, and doing the work with long reach boring bars (Fig. 1). The real machine work is making the ¼ inch-thick aluminum engine support plate (Fig. 2) and the starter support block (Fig. 3). These could be done with a power drill and band saw, but we had the advantage of a complete tool shop, so we dowel-pinned two plates together and did them together.

Tawse brought his engine up to our shop so we could do the milling for him. He assembled the modification. Where we removed the hand starter we made up a fiberglass support for the tach drive (Fig. 4). The ring gears came bored out to nicely press on to the fly wheel. Hirth holds the ring gear on with Lock-

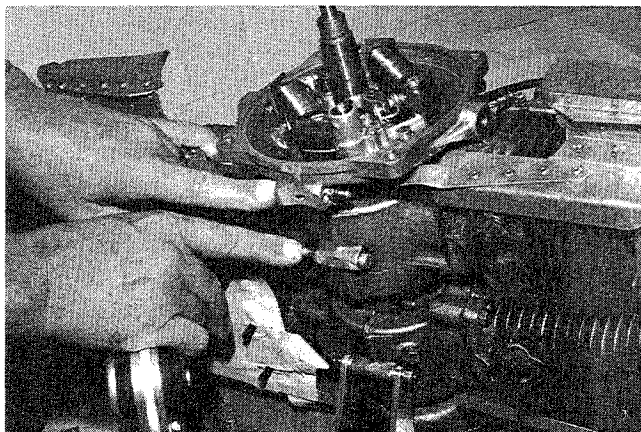


Fig. 1. Milling required to clear starter

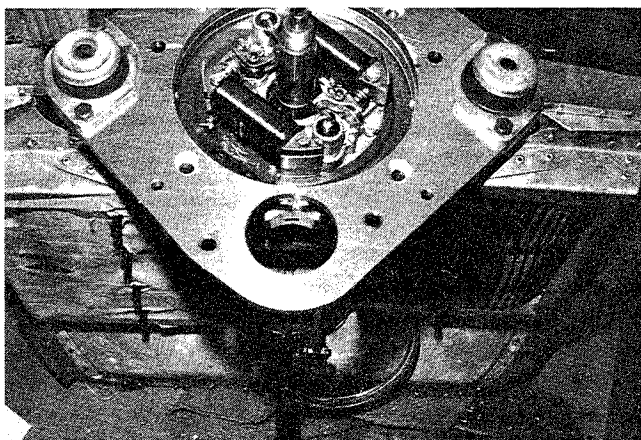


Fig. 2. Engine support plate with starter mount at bottom

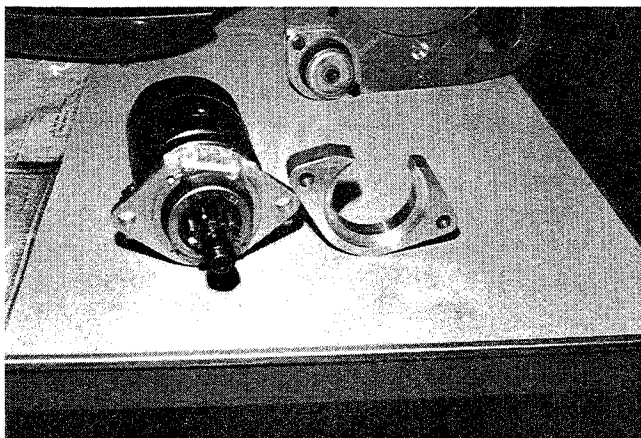


Fig. 3. Starter mounting flange and spacer milled to clear crankcase boss

tite. We did it too and it works, although it worries some. The success with Locktite is dependent on clean surfaces.

There are three options on the battery-charging problem. 1. We left our magneto wired as originally with two magneto coils 180° apart. This is what Schleicher recommends and they charge the battery with a Ducatti generator. We elected to forget about charging because the engine does not run enough to do much good. The battery specific gravity is

checked at the end of each day and if down the battery is recharged during the night for the next day. This seems to be the safest system. 2. Fred Jacobs, who was converting his SF-27M at the same time, elected to remove one magneto coil and substitute battery ignition on two cylinders with two others firing from the mag. This allowed him to install the charging coil in the mag giving him two amps charge when on engine. Scheibe recommends this and it is common on -27M's. 3. The Flugsportgruppe, Limburg/Lahn who have been the most advanced in improving motorgliders, were the first to propose the generator coil with battery and now have worked out a scheme using only one magneto coil to fire all cylinders. The diagram shows how the dual ignition points alternately ground and break the circuit (Fig. 5). Very clever. Notice that the ignition is always "on" and the engine is stopped by shorting the coils.

We used a Japanese motorcycle 14-ampere-hour 12-volt battery and a similar source starter relay. The battery was located as far back on the canopy deck as it would go to keep the C.G. of the whole installation from going forward due to the addition of the 7½ pound starter and ring gear. The starter wires

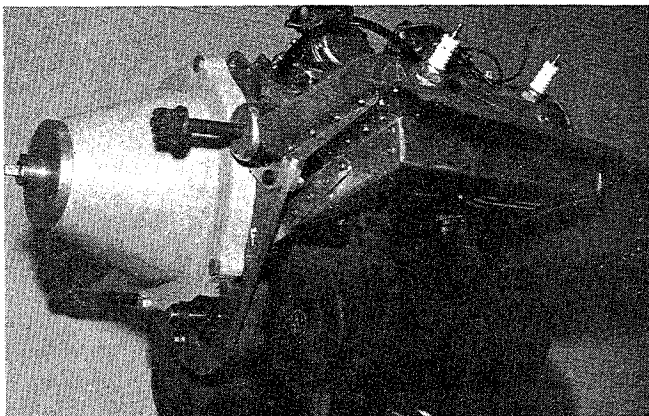


Fig. 4. Fiberglass tach drive support which covers flywheel and ring gear

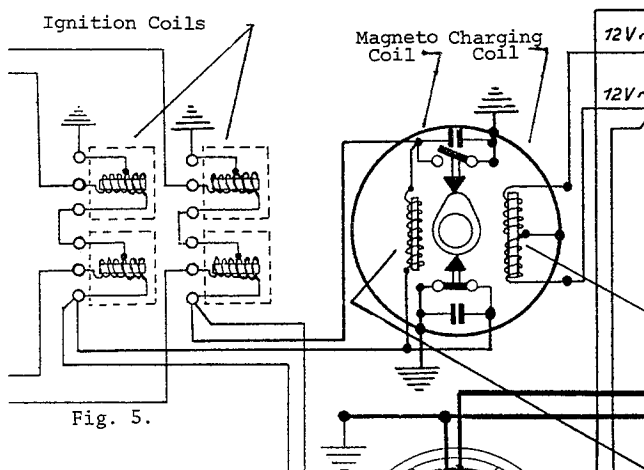


Fig. 5.

were multiple strand #6 with 600-volt vinyl insulation. The starter button is located where the pull starter had been. The hand starter weighed 5½ pounds and I also removed an 8-pound gel-cell which was replaced with the wet battery weighing 10 pounds including starting relay. On my ship the net increase in weight including nuts, bolts, and wire is 10 pounds. This will vary depending on how you are presently equipped and how hard you work for weight control. Our problem is to keep below the allowable loaded weight of the ship. On the AS-K 14 it is possible to hold empty weight to 550 pounds. This leaves 245 pounds as disposable weight.

Having done all this, the question one is asked is, "How do you like it?" We took our ships to Bald Eagle Ridge the second week in April and the starters got their first try in the air. Our reaction is - Why didn't we do it sooner? With two-cycle engines the starter has trouble getting through the first compression, but from there on the engine is cranked with vigor. After shutting off the engine the prop may not be horizontal. As we have to feather the prop, it is easy to turn the engine slowly by starting the feathering, but hold a steep pitch which causes very slow rotation and then snap it into full feather when the prop is where you want it.

One of the things that bothered me in ridge soaring in former years was the hazard of trying to get a hand cranked engine start when one is really down to almost no altitude. The electric starter gives an almost completely reliable start and it can be done in three seconds on an AS-K 14. The drill is—have throttle and choke pre-set; then unfeather the prop, throw the ignition switch and push the start button. These three actions are all done with the right hand and the engine fires right off.

My flywheel-ring gear assembly was unbalanced which required the making of a stub shaft on which the flywheel assembly was mounted and rebalanced. This was due to a second hand ring gear but Tawse did not have this problem. The cost of the parts was: Starter motor, \$50; Ring gear, \$14; Starter relay, \$15; Battery, \$30; Cable, Switches and Hardware, \$30.

We are indebted to Rudolf Kaiser, of Schleicher, and Herman Michel, of the Flugsportgruppe Limburg/Lahn, who were instrumental in this development work. The Flugsportgruppe has a new quiet muffler for the AS-K 14 and have supplied me with the drawings. After I get one built it will be reported.

ELECTRIC STARTER FOR SF-27M, N54175

by Fred Jacobs

Converting my SF-27M from hand to electric start was really a motorglider community project. Correspondence and discussions with Bill Mouton and Lew Tuttle helped influence me but the final nudge came from my flights at Glen, New Hampshire. A low level relight gave me some anxious moments and it wouldn't start after landing from a 24,500-foot flight. I decided that more reliable starting was required and I swear by it since my ridge soaring at Bald Eagle Ridge in Pennsylvania. Works like a charm.

Walter Buhl supplied names of dealers for the ring gear, starter, charging coil, rectifier, etc. Also invaluable advice on procedures and some morale lifting when I became discouraged.

My ring gear had a lip that had to be ground off so that it would slide on to the flywheel and clear the crankcase. In addition to Loctite I ground two notches in the rear of the ring gear for two set screws. These prevent the gear from turning or sliding backward on the flywheel. Two more set screws in front of the gear ensure that it won't move forward.

The starter mounting brackets were made from AISI 4130 Chrome Molly 0.063-inch sheet. The crankcase flanges had to be trimmed so the Bendix gear and ring gear would mesh.

One magneto coil was replaced with a generating coil and rectifier to charge the battery which in turn powered half the ignition system.

An 18 A.H. Prestolite garden tractor battery supplies adequate power. My attempt at building a fiberglass battery box resulted in a sieve. Discarded this and built one of 22-gauge stainless steel pop riveted and sealed with epoxy.

The electrical system added 27.6 pounds. The doors were adjusted to open wider and stainless steel guards placed over two fuselage tubes bumped by the starter going in and out. A bracket similar to Lew Tuttle's was made to hold the propeller brake and support the engine when retracted.

Many hours were spent thinking, measuring, calculating, recalculating, making and fitting the parts. A friendly machinist ground the lip off the ring gear and an EAA member welded my brake bracket.

It was a lot of work but well worthwhile. The next task is to modify the magneto coil so it will fire all spark-plugs according to a schematic forwarded by Walter Buhl.

GERMAN MOTORGLIDER ALTITUDE RECORD

by Helmutt Lehmann,
translated by H.G.A. Buytendyk

Like an ocean voyage is to a yachtsman, the high altitude wave flights are to the soaring pilot. Unfortunately not all of us can tow our sailplanes to Innsbruck (Austria).

Record flights take lots of planning, patience, and careful calculations. Time and costs build accordingly. The most nerve-racking is, that the wave as promised by even the best weather service is no guarantee. So I waited for weeks and so did my parachute, barograph and oxygen equipment which remained ready in my garage. Finally the low pressure area in England became deeper and the high pressure area in Yugoslavia started to move. This was a good sign.

The next morning I filed a flight plan from Ampfing (Germany) to Innsbruck and return—120 miles. Mr. Hadl,

the air traffic controller from Ampfing, sealed my barograph. On the way we went, reaching Rosenheim. The engine was shut off in lift of 400 ft/min about 600 ft above the first ridge. Soon I climbed to 5000 ft when all hell broke loose.

I was not familiar with the area and the moisture level was low so there were no clouds to show me the rotor location. My previous experience with turbulence was limited but I had read a great deal about the wave rotor so everything in the cockpit had been properly secured. I said had been because even with my careful precautions now my cockpit looked and sounded like a garbage truck going over an obstacle course. I tried to penetrate but was too low for the first mountain range. I tried three more times but failed due to altitude, turbulence, and I may as well admit it, my knowledge was minimal.

It had been three hours now since the engine was shut down, my location still short of the Austrian border. With

remaining time and altitude available. I turned home for Ampfing, 48 miles north-east and made the Ampfing control zone with altitude to spare. Somewhat frustrated with my accomplishments I checked with the weather bureau, which promised high winds and from a more southerly direction. Putting my *Sperber* to bed I logged 3:58 hours engine-off time.

I did not sleep that night and found myself at the airport at 7:30 a.m. Saturday, November 16. Mr. Hadl arrived shortly after the reported that the wind speed at Patscher Koff was 105 knots. This was indeed impressive. Mr. Hadl checked my barograph again and smiled without saying a word. He wished me luck and helped me secure all equipment, including the pilot.

Shortly after takeoff and under power, I soon realized things had changed: indicating 112 mph I was barely making a ground speed of 50 mph, so I left the engine running until I reached Kufstein. This little trip of 55 miles took me 1:15 hours.

Turbulence started again so I climbed at low airspeed to avoid the beating I had taken yesterday. Slowly I moved on to Mariastein. On the radio (123.4) you could hear conversations of several sailplanes in the area experiencing strong lift. This gave me hope and courage for my wave attempt.

I stopped the engine 1300 feet above the ground (4000 ft ASL). With the spoilers open, I made a one-minute spiral descent to put a clear notch on my barograph. Penetrating now at 90 mph in a south-westerly direction the *Sperber* made contact with the wave. I looked around and was all alone. Then as if in the hands of angels we soared up and up at 650 ft/min. My excitement at this moment cannot be put in written form. My nervous tension of the last two days gave way to the beauty of my surroundings. Innsbruck shadows gave way to the early sunrays and as it became smaller it was as if I cared no more. There was no turbulence, and no noise except a light crackling from my radio.

The pointer of my vario shows a steady 4 m/s (787 ft/min) climb at 75 mph and some turbulence now which was increasing. I called to the sailplane appearing above me seeming 3000 feet higher. He told me to increase my speed as he explained my position to be in the secondary wave. I followed his advice and with a speed of 96.8 mph penetrated south. Previously during penetration, I had noted lift to be nil and this had me worried. Now again I showed 550 ft/min up. Slowing

now and keeping slightly ahead of my unknown friend (*Libelle*) this position showed to be perfect. He reported 13,000 ft ASL. I wasted no time to hook up my oxygen and climbed ahead of a small lenticular in complete calm.

It had been quiet now for a while and something came over me. It was not fear, neither was I completely relaxed, I could however, not feel a muscle in my body, yet I was there along with my *Sperber*. I wanted to scream, yet kept a watchful eye on my oxygen blinker. Assuring was the tick-tick of my barograph.

Several other sailplanes now appeared below me. Rudi in his *Libelle* still above and appeared much smaller. I exchanged my position and experiences with Rudi who reported 9000 meters (29,520 ft). Other "glass" machines could not believe when I reported leaving 27,000 ft to Rudi. This was my first real big one and I was proud.

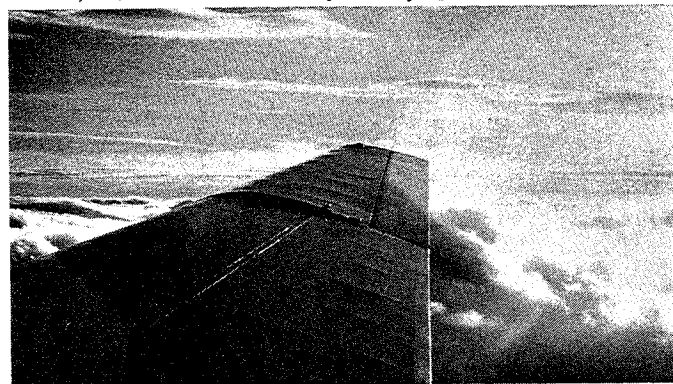
It was evident to me now that I had made a good choice with my *Sperber*. Together we could be home tonight and call it a day. And what a day it was. Even the glass boys realized this fact.

My oxygen was to the point a decision had to be made. I reported to Rudi my indicated altitude of 8300 meters (27,224 ft) asked for his phone number and said goodbye to a man I had never met. I reached Ampfing without using the engine and 4 hours and 18 minutes later.

Tuesday the German Aero Club called with good news for me. I had established two new German motorglider records with a height gain of 21,714 feet and an absolute height of 25,528 feet above sea level.

The good combination of clean lines, relative high speed capability and a fine glide ratio I can confirm the *Sperber* to be a fine soaring bird.

(It is interesting to note that the *Sperber* and the *Libelle* both made this flight together and bettered all other attempts that day.—H.G.A. Buytendyk)



WHY DON'T WE USE MOTORGLIDERS MORE FOR SPORTING PURPOSES?

by Per Weishaupt

Motorgliders have existed for more than 50 years and have been practically used for more than 10 years. There are probably more than 1000 of them flying today. These are mainly used for three purposes:

1. Training. Elementary and advanced training in gliding and soaring. For this they are very suitable and extensively used.

2. Pleasure soaring. For pleasure soaring they are also suitable even if the performance of most of them is not very high. They are used a good deal because they:

a. can be taken out of a hangar without helpers and be started by the one or two persons who are going to fly in them

b. can transport themselves from a base airfield, where for airspace or meteorological reasons soaring may not be possible, to an area where soaring can take place—and back again afterwards.

3. Power flying. For traveling and pleasure flying as a powered aircraft they are not as well suited and in some ways more expensive than conventional powered aircraft, but they are useful enough for a certain group of pilots for local flying, for visiting neighboring airfields and they can even be used for real long-distance flights.

By being used as powered aircraft when soaring is not possible utilization of the aircraft is increased and the cost per flying hour reduced. The combination of a not-very-good glider and a not-very-good powered aircraft has proved to be a very good all-round aircraft for many purposes.

However there is a fourth purpose for which they were intended:

4. Sporting soaring. For real sporting soaring they have up till now been used too little, even if the FAI rules some years ago were changed into the direction wanted by the users of motorgliders.

a. Since it has been possible to fly special *records* for motorgliders only few of these have been recorded in most countries.

b. Although they may be used for

badges this has only taken place on a very small scale.

c. *Competitions* for motorgliders seem to have been more or less confined to the competitions at Burg Feuerstein, Germany, and even these have not attracted countries enough for the contest to count as an official FAI contest. The possibility for a World Championships was opened by the CIVV several years ago, but as long as there are no more local competitions and no real international ones there will of course not be a World Championship.

Therefore the CIVV has asked its Subcommittee to look into the matter and make proposals for sensible rules for performance soaring with motorgliders, as the present rules do not seem to have attracted attention enough.

The subcommittee is now starting its work by trying to make the users of motorgliders express their opinion on the subject. So:

1. Why don't we use motorgliders more for sporting purposes?

2. Are the owners of motorgliders content to use them for training, pleasure soaring and traveling and not at all interested in records, flying for badges and competitions?

3. Or is it the rules for sporting use of motorgliders that are wrong?

4. If so, in which way do you want them changed?

5. Do you want motorgliders used for sporting soaring exactly as normal sailplanes, that is without being allowed to use the engine after crossing the starting line?

6. Or do you want the engine to be used not only as ballast but in a certain amount also as part of a sporting performance?

The CIVV Motorgliding Subcommittee is asking all users—and prospective users—of these sailplanes to help it in analyzing the present situation and finding out in which direction future rules should go.

Please let us hear from you.

Please write to the President of the subcommittee at the following address:

Per Weishaupt
Kongelig Dansk Aeroklub
Copenhagen Airport
DK-4000 Roskilde
Denmark

FOREIGN SCENE

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

The "Fan-Pod" Power Package

The European aviation magazines gave considerable publicity last year to a newly developed propulsion package—the "Fan-Pod". It is a creation of a well-known aircraft company, the Rhein-Flugzeugbau. In spite of all promotion, the Fan-Pod, because of its size, can only be used in a two-place, side-by-side, auxiliary-powered sailplane as a retractable power package (see illustration of such a proposal); also for boat propulsion. When installed as a non-retractable (fixed) propulsion unit on a sailplane the substantial additional drag when not in use will convert any sailplane into a glider.

The following summary is based on an article in the German *Aerokurier* (April 1974):

The Rhein-Flugzeugbau is regarded as the cradle of the shrouded propeller technology in Germany. One objective is to reduce the noise below the levels of railroads and streets. In addition to exploration activities with various airplanes the company is known for its development work with auxiliary-powered sailplanes *Sirius 1* and *Sirius 2*.

The single-place *Sirius 1* had two Wankel engines (20 hp each) driving a shrouded propeller. Although the results were satisfactory, the noise levels were too high. The two-place *Sirius 2* had two 30-hp Wankel engines; the expected thrust levels were achieved. Comparable thrust levels could be obtained with ordinary propellers having much larger diameters. With this accomplishment the efforts were devoted to lowering the noise levels.

The Fan-Pod is a power package in itself, ready for installation (see illustration). Based on experiences with *Sirius* auxiliary-powered sailplanes the Fichtel and Sachs Wankel engine of 22 hp is the heart of the Fan-Pod. Two such units are coupled together in one Fan-Pod, developing 187 pounds of static thrust at 5400 rpm. The first such power package was installed on a *Blanik* (non-retractable). The noise levels were reduced; at 985 feet altitude, 57 dB(A) were measured, some 10 dB(A) below the currently approved levels for APSs—the FAA goal for the 1980's.

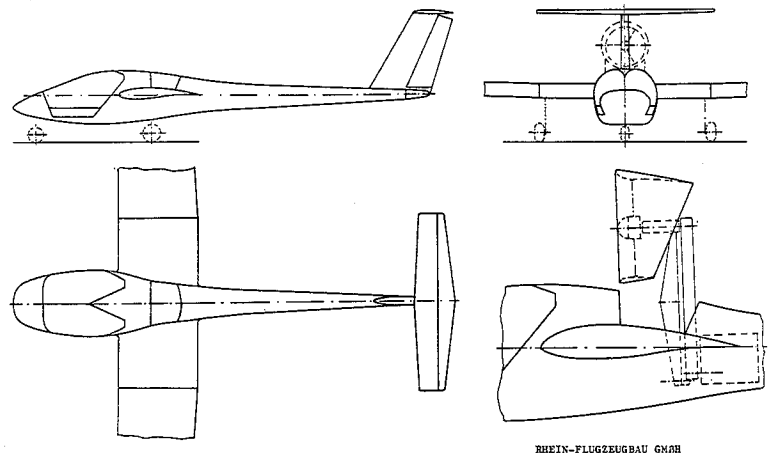
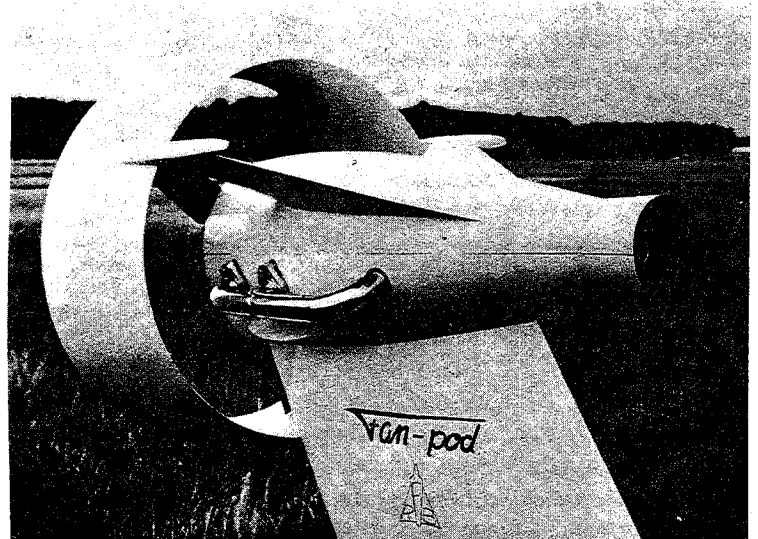
It takes about one half hour to in-

stall or remove the Fan-Pod.

The Wankel engine develops 22 hp at 5400 rpm; the fuel consumption is 4.5 gallons/hour. Attempts to use Wankel engines in airplanes were not successful. The reason lies in the nature of the engine design—it has a hot spot which requires proper cooling. Cognizant of this fact proper steps were already undertaken when installation was made in *Sirius 1*. Thus the Fan-Pod can run full throttle on the ground without reaching the critical temperature; the engine provides its own forced-air cooling.

NASA studies show that Wankel engine is most likely the answer to the propulsion question of the 1980's.

The complete "Fan-Pod, SG-85", ready for installation in sailplanes is priced at 6,000 DM.



Technical Data

Fan: Three- or four-bladed reinforced plastic; Shroud: plastic sandwich construction; Engine fairing (nacelle): fiberglass; Engine: Wankel, two units KM 914, electric starter and 12-V generator; Engine mount: metal pylon (7.9 inches long);

Overall length: 47.3 inches; Max. diameter: 29.6 inches; Inside diameter (shroud): 25.6 inches; Weight: 123 pounds.

Bergfalke IV-SM

One of the newly designed-homebuilt power packages appeared in a *Bergfalke IV-SM* during the 1974 APS Contest at Burg Feuerstein. It was a creation of an engineer, Dipl. Ing. Bernd Scheffel. He received the first prize from OUV in recognition of his development work over the past several years.

The following account is based on an article in the April 1974 *Aerokurier*:

This retractable power package is somewhat different: instead of swinging the engine with propeller on a pylon, the engine is mounted in the fuselage.* This results in smaller trim changes.

The propeller is driven by a timing belt (2/1 reduction). The belt drive is connected to the engine by a universal joint which also serves as the hinge. The slower rotating propeller of large diameter has a better efficiency and is also less noisy.

In order to accommodate the rather bulky, trusslike pylon the fuselage was

* Similar to our design developed in the late 1960's and used in our APS I and APS II; see *Motorgliding*, May 1971 and Jan./Feb. 1972 issues.

newly built, the main wheel was moved backwards, and a new nose wheel was added. The canopy was extended forwards.

In addition to the throttle there is another lever which actuates the doors, extension and retraction of the pylon with propeller, and stopping the propeller. It stops automatically in a vertical position once the retraction cycle is actuated.

The nose-down pitching moment due to the propeller thrust is only slightly noticeable since the horizontal tail is partly exposed to the propeller stream.

The engine is the Hirth 028 with two carburetors and an electric starter. It develops 50 hp.

The two fuel tanks in the wing roots provide fuel for four hours, corresponding to a range of 280 miles. Flown as a single seater it has a rate of climb of 492 fpm at 59 mph. This design was shown in the May 1974 *Motorgliding*, illustrations 6, 8, 9, 10. Some other technical data:

Wing span	56.5	ft
Wing area	183	sq ft
Aspect ratio	17.4	
Empty weight	900	lb
Gross weight	1320	lb
Wing loading	7.2	psf
Glide ratio	30	
	at	56 mph
Min. sink		2.6 fps

POSTFLIGHT NOTES

Please note that we have acknowledged the reality of our situation and have become bimonthly, with a realistic issue date. Therefore, Volume 4 was completed with Number 8, the August 1974 issue. This issue is Volume 5, Number 1, and is dated August-September 1975. When the volume of material increases enough to justify it, we shall again attempt monthly publication.

We realize that none of our subscribers will be able to figure out when his subscription expires, but we think we can. When we figure it out, we'll let you know. In any case, it is not necessary for you to send money to renew your subscription until you receive a notice from us.

Those of you that are readers of *Soaring* will now be aware that Stan Hall has suspended work on his *Oryx* (December 1973 *Motorgliding*) in order to devote his energies to the *Vector I* project. *Vector*

I is a foot-launched ultralight designed for cross-country soaring.

We have learned that Vern Oldershaw has flight-tested his 0-3 sailplane, modified for an engine-prop installation, also of his own design. You will recall that his design allows the engine to remain in the fuselage, behind the cockpit. The propeller is belt-driven, and is retractable.

We urge you to submit articles and photos for *Motorgliding*.

LETTERS

Editor:

There are some readers who are not pure and wait for the day of the RF-4D with back seat and dual ignition and 80 hp on the short wing, or better, AS-K 16 with certificated VW less about 20 feet of wing, less about \$15M on the price.

Don McHenry
Eagle Pass, Texas

Editor:

I had to chuckle over Steve du Pont's article about the RF-5B "Confessions of a Motorglider Eater", Vol. 4, #8, Aug. 1974. It was a very amusing and enlightening commentary on a piece of equipment I have not yet had the opportunity to see first-hand. The only thing missing was any mention of probably the biggest rock of all—the one that blocks the entrance to the cave for most—its price tag.

Dick Stevens
Flint, Michigan

Editor:

I would like to report that there is now one flyable Nelson (BB-1) *Dragon-fly*. I have just finished an 18-month restoration of N4ND (formerly N34919). I first flew it on April 19, with the original Nelson engine installed.

This Nelson engine has had a long history of unreliability, and true to form siezed a piston about 10 minutes after takeoff. This presented no problem as the flight was made off a large dry lake in the Pahrump Valley.

A Rockwell 2F-600-1 engine was then installed and six flights were made off the dry lake on April 23. The engine

change was possible in such a short time because I had planned on using it eventually and it was ready to bolt on.

I am currently flying on an Experimental airworthiness certificate for Research and Development on the Rockwell engine, but plan to obtain a Supplemental Type Certificate in the near future.

The Rockwell engine seems to be well suited for this application having magneto ignition, electric starter, alternator, and a few more horsepower than the H-44 Nelson. Several other aircraft are flying with this engine and it is designed for use on propeller-driven vehicles. Other users report the engine to be very reliable, and that has also been my experience so far.

I have parts to repair the Nelson engine and will preserve it in case a future owner should wish to return to the original configuration for historical purposes.

Flight testing with the new engine is continuing from the new Hidden Hills Soaring Center run by Ross Briegleb at Pahrump, Nevada, where, I might mention, soaring conditions are outstanding. The *Dragon-fly* was flown from this airport on April 3.

I plan to sell this ship in the near future and move on to a high performance sailplane and perhaps another restoration project of some kind. This ship will be on display at the West Coast Antique Fly In at Merced, California on June 7 & 8.

Bob Seals
Las Vegas, Nevada

CLASSIFIED ADS

WANTED: FOURNIER RF-4D, J. O. Hankammer, 3920 Chelmsford, Topeka, Kansas 66610. (913) 478-4863.

SF-27M for sale. Radio, instruments, enclosed trailer. Virtually new. Homer J. Rader, Jr., 1226 Commerce, Dallas, Tx. 75202; (214) 741-3641.

DESIGNING & BUILDING your own auxiliary-powered sailplane and in need of sound engineering advice? For free detailed information send a self-addressed stamped envelope to: Amtech Services-mg, RD 8, Mansfield, Ohio 44904.



The Winners!

Scheibe's popular high performance powered sailplanes once again demonstrated their superior flight qualities by taking first and second places in their class at the 1974 Burg Feuerstein motorglider competitions. Year after year Scheibe powered sailplanes consistently outperform the heavier and less maneuverable ships. No wonder more pilots fly Scheibe powered sailplanes than all other makes combined!



Contest winning performance at a reasonable price, plus docile handling characteristics and a worthwhile range under power (about 280 miles) mark the Tandem Falke as today's best value in self-launching sailplanes. The 60 hp Limbach engine with a Hoffman feathering propeller provides plenty of power to operate from regular airfields.

Engine-on Performance

Takeoff run	500/650 ft.
Rate of climb (sea level)	430 ft./min.
Maximum speed (sea level)	106 mph
Cruising speed	81-93 mph
Endurance (cruise)	3 hours
Fuel capacity	10 gallons

Gliding Performance

Maximum glide ratio	26/27 to 1 at 53 mph
Minimum sinking speed	2.95 ft./sec. at 43 mph

The Tandem Falke's outrigger wheels and steerable tailwheel allow completely independent operation. With its outrigger wheels removed the Tandem Falke may be conveniently hangared with other sailplanes.

A side-by-side version is available for pilots who prefer this arrangement. Similar performance, but slightly lower rate of climb and glide ratio. Order the SF-25CS "Falke."

Prices include flight test, German certificate of airworthiness, flight and engine instruments, electric starter, feathering propeller, cabin heater, upholstered cockpit, two-tone paint, packing in container, and shipping to the port of Hamburg:

Scheibe SF-25E Super Falke	DM 55,500
(First place, 1974 Burg Feuerstein)	
Scheibe SF-28A Tandem Falke	DM 49,800
Scheibe SF-25CS Falke	DM 49,000

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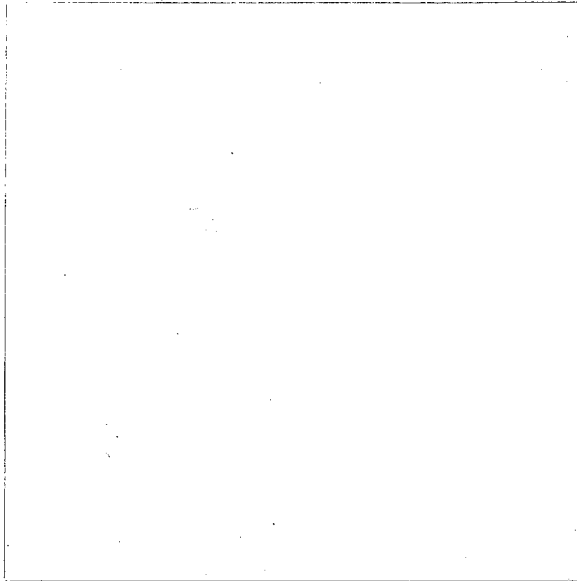
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