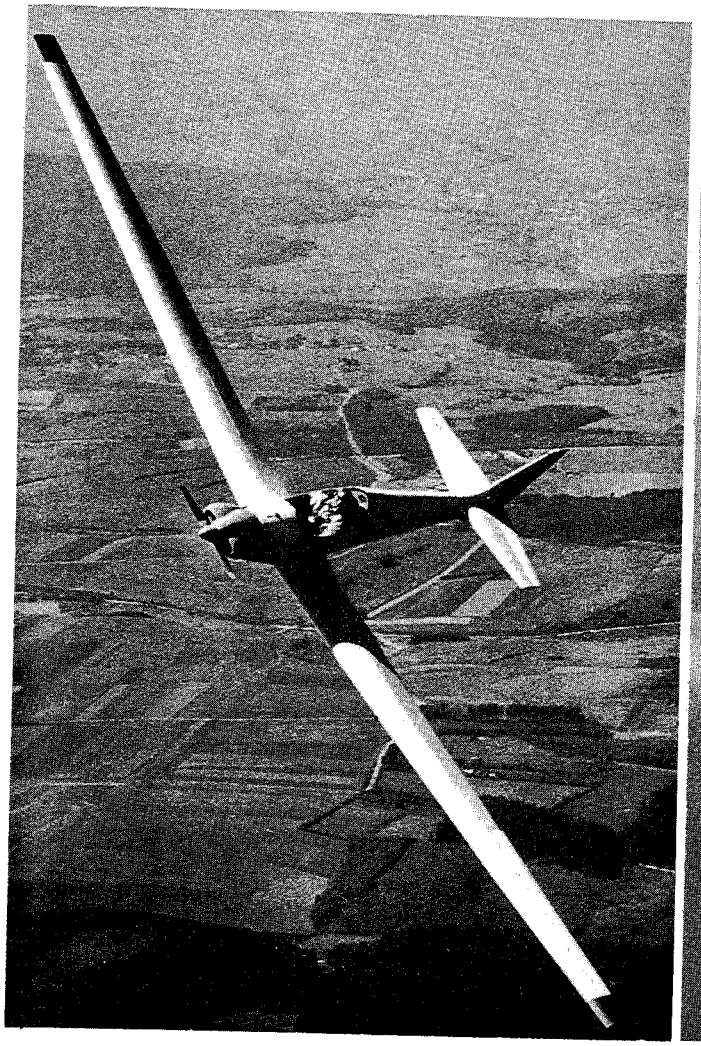
MOTORGLIDING

AUGUST 1973

YEAR AROUND UTILIZATION & INCREASED ECONOMY

IF YOU WANT MORE ENJOYMENT FOR LESS COST

FLY A **POWERED** SAILPLANE



SFS 31

RF 5 B

Type	Span	L/D	Cost*	Delivery	Seats	HP	Engine	Rt. Sink
RF-4D	37 ft	20	DM 33,600	6 month	Single	36	VW	4.0 ft/sec
SFS-31	49 ft	29	DM 37,800	6 month	Single	36	VW	2.8 ft/sec
RF-5	46 ft	22	DM 50,400	6 month	Dual	68	VW	4.6 ft/sec
RF-5B	57 ft	26	DM 52,390	6 month	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(s), Seat cushion(s), Tail antenna, Cabin vent(s), Recording tachometer, Oil pressure gauge, Battery, Oil temp. gauge, Ammeter, Starter (elec.), Exhaust silencer(s).

* Ex-factory

SPORT-AVIATION INC.
401 HOLMES BLVD. WOOSTER, OHIO 44691 (216) 262-6301

MOTORGLIDING

Donald P. Monroe, Editor

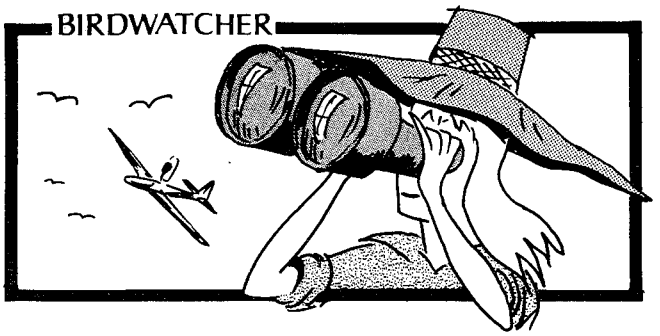
Vol. 3, No. 8 Published by The Soaring Society of America, Inc. August 1973

Contents

Cover: Fourniers in flight, by George Uveges

Motorgliding is published monthly by The Soaring Society of America, Inc., whose offices are at 3200 Airport Avenue, Room 25, Santa Monica, California 90405. The mailing address is Box 66071, Los Angeles, California 90066. Subscription to *Motorgliding* is $5.00 ($6.00 outside of U.S.) for one year (12 issues), beginning with the current issue. Back issues are available at 50¢ each. Second-class postage paid at Santa Monica, California and at additional mailing offices. Application to mail at second-class postage rates is pending at Santa Monica, California. Readers may wish to correspond directly with Harry N. Perl, Chairman, Powered Sailplane Committee, 3907 California Way, Livermore, California 94550; or Richard Schreder, Chairman, Airworthiness and Certification Committee, Box 488, Bryan, Ohio 43506.

Circulation of the July 1973 issue was 1130.



Readers of *Motorgliding* could hardly know that most of the labor that goes into this publication has been done by Don Monroe of the SSA. As editor I assembled the material and received communications and made a table of contents for the issues adding my own observations, explanations, and excuses as the Birdwatcher. The rest of the job was handled by Don who was an outstanding editor of Seattle's *Towline*. So it is right and proper for Don to assume the dignities and prerogatives of the office of Editor of *Motorgliding*. He will do a good job. *MG* readers will have reason to be happy that he has consented to do it.

I want to thank you all for the encouragement, the complimentary letters, and the fine material you provided during my tenure. I'm sure you will all agree that a motorgliding magazine is more properly the business of a glider pilot than of a birdwatcher. I'll be watching you. Thanks, Don.

Sincerely,
Elena Klein

Thanks for the kind words, Elena. A lot of credit for the appearance of Motorgliding *must be given to Beverly Pearson, who has been doing the excellent typing of the copy. I'm glad for the opportunity here to publicly express my appreciation for her contribution—Ed.*

LETTERS

Editor:

Shades of *deja vu*.

This was my first reaction on reading Arnold Skopil's interesting article in the Apr. *Motorgliding* issue in regards to his trials and tribulations with his powered *Bergfalke*. Only thing is, Arnold was there first, about twelve years ago, so I feel that I just stepped out of a time machine after concurring with every miniscule detail of his story.

The most important aspect of the emergence of *Motorgliding* is the simple fact that these events will now be properly chronicled for future reference. I would have given anything to know about Arnold's experiences before I received my SF-27M; and although it wasn't tragic (I'm still here), it sure would have saved a lot of trials in the wrong direction before I arrived at his exact same conclusions.

The lack of local soaring sites and soaring types; the need for independence (brought about by the anti-social cathode ray tube), and general indifference to soaring by the general public and regular pilot types, has finally focused attention upon the powered sailplane in a very powerful way. Amazingly enough, even though I do it every weekend I can, many of those who see it still do not believe it!

I'm sure Arnold would agree with this point: you cannot think *up (soaring)* until you have finally solved all of the ground-handling, taxi, traffic, and minor and major engine problems. However, once this is accomplished, it becomes of utmost importance to *soar*, and all flights are made with the idea of using the engine only for launch, except in purposeful trips to search out new soaring areas. And I certainly concur with the idea of a "planned goal flight". I had a pretty close call the week before I read his article in trying to *soar* in *sink*—down low. Lotsa nice bubbles, but no real lift. So now I have adopted a new rule: 1,000 feet ASL (Above Swamp Level) is GROUND ZERO for a powered sailplane, therefore at 1500 feet AGL you must be committed to landing or re-start; IF it re-starts. And therefore, I must re-start directly over a landable runway, at or before 1,000 feet. It is far better

(continued on page 12)

MOTORGLIDER SAFETY

by Tasso Proppe

Safety, according to Military Standard 882, is defined as: "Freedom from those conditions that cause injury or death to personnel and damage to, or loss of equipment or property.

Safety engineering is trying to reduce the cause and probability of those conditions to occur—you cannot eliminate them entirely—and *if* they occur, reduce the severity of the resulting damage.

It might be useful, in this context, to distinguish between damage you do to yourself and to your machine versus damage you do to others. The licensing (and restricting) agencies should be more concerned with the latter, of course, and less with the first.

Safety analysis, then, takes a look at the probabilities of various failure modes and the severity of damage caused by such failures. Both values can be measured, and the effort to reduce cause, probability, and severity can be balanced against cost in terms of money, performance, and complexity.

Measuring probabilities is done by statistics. For example: from my experience as instructor and technical manager of a gliding school, I expect an average of about two to five aborted launches per winch per weekend day (120 to 150 operations) caused predominantly by snapped cables. It causes tense moments but hardly ever more than a few scratches. The probability of this failure mode: 2 in 100, or 0.02. Severity: very moderate. The powered airplane equivalent, an engine failure during takeoff has a much lower probability, let's say 1 in 200,000. (That's about once a year on a busy airport—600 operations a day), but *if* it happens, it is generally a catastrophe.

Why?

Let's look at the other measurable quantity, the amount of expected damage. Damage is the conversion of energy: kinetic energy into deformation (bent fenders, broken bones), or chemical energy into heat (burning fuel) or pressure (explosion). The energy is just *there*, you cannot make it disappear. The undesirable event (failure) unleashes it to convert into another (out-of-control) form. Here are the figures for those that want it straight:

Kinetic energy is mass times the square of velocity over two, $E = \frac{1}{2} mv^2$.

My motorglider weighs 700 lb; divide that by "g" (32.2 ft/sec^2) you get the mass: 22 "slugs" or lb sec^2/ft.

Speed at takeoff: 41 mph; multiply by 1.47 to convert into ft/sec = 60 ft/sec; then $v^2 = (60)x(60) = 3600$ ft^2/sec^2, and the energy is: $E = (\frac{1}{2})x(22)x(3600) = 40{,}000$ ft-lb.

If a failure occurs (winch cable breaks, motorglider engine quits) at or shortly after lift-off (400 ft. down the runway), you convert that energy into heat at the brakes, and if you assume a conservative friction on the ground (like a dirt strip), you end up with a braking distance of 300 ft and plenty of runway to spare. If it happens at the end of the runway, you have already sufficient altitude to turn around safely and make a downwind landing. For in-between conditions, there would be some concern, if you operate from a small field, but hardly any serious damage: The energy conversion is a *controlled* process.

Compare that with another example, say, an early vintage jet fighter: 16,500 lb, divided by 32.2 ft/sec^2 makes a mass of 515 slugs (lb sec^2/ft). A lift-off speed of 160 kt = 180 mph converts into 264 ft/sec and $v^2 = 70{,}000$ ft^2/sec^2. The kinetic energy at that condition amounts to: $E = (\frac{1}{2})x(515)x(70{,}000) = 18{,}000{,}000$ ft-lb.

That's 450 times the damage potential of my ship.

One does not have to assume a straight-out engine failure. A mere power deficiency prevents it from getting airborne, a misfortune which the conductor discovers not until he is 3/4 of the way down the runway and committed. It is impossible to convert this energy into anything in a controlled manner. If an abort is attempted, there is generally not enough runway left. It might be possible to use up some 20 percent of the energy at the brakes, but this generally results only in blown tires. The remaining 14,000,000 ft-lb are converted

into mechanical deformation of the airplane and the structures in its path.

A grown (175 lb) man falling from 2 story roof (17 ft) is 3000 ft-lb worth of damage (so is a bicycle rider slamming into a brick wall at 23 mph). That's considered a rather unhealthy exercise—the example above amounts to 47,000 times that much.

The probability figures of this second example depend on the maintenance environment. The sophisticated propulsion system requires a number of highly trained specialists for a variety of electro-mechanical servo systems (fuel management is the worst of them), and those mechanics better be fluent and up to date. The military figure (I have a back-up file for this analysis) applied to this example is roughly two aircraft destroyed per 100,000 takeoffs, and half of that accident rate fatal to the pilot. Note that this is four times the assumed "busy airport" figure. Equipment sophistication and speed increases the probability of an accident as well as its seriousness. For a private individual/hobby environment, that figure may well differ by a factor of 10 to 100. Considering the energy involved, this failure rate is too high under *any* circumstances.

However: our decision-making bureaucracies are slow or reluctant in recognizing the type of quantitative safety analysis above. To them, both machines are carrying the label "Experimental". If an accident happens to or is caused by one, the subsequent restrictive "safety" measures are imposed on both—which sometimes amounts to having to cage a seven-lb rabbit with the same precaution requirements (moat and ½-inch iron bars) as a 300-lb lion. (Do you remember the energy factor between the two examples—450?)

Time and space do not allow an exhaustive safety analysis of the entire motorglider system. I only wanted to set the stage for the discussion of a few typical issues that have been haunting and hampering the development of motorgliders in this country—some of which are carry-overs from the bygone days of caster oil, the primer-petcock, and the hand-cranked starter magneto.

A glider does not need a motor at *all*. Any motor, then, will be an improvement in vertical maneuverability and therefore safety. If that motor quits, your safety is reduced to glider safety which is pretty good due to its low speed and energy and due to a good gliding angle (lateral maneuverability, choice of landing area).

However, if you want to use an engine and have your glider licensed, there is an FAR requirement that engines, if used in the air, must have two independent ignition systems, and a lubrication system that functions under extreme attitudes, preferably upside-down.

Now, any small car engine (I have in my ship a 2-cylinder Steyr-Puch that looks like half a slice of a VW) would eliminate itself from the automobile market if it had a failure rate of the ignition system that had to be improved by adding another, redundant system rather that rely on reasonable maintenance. Dual ignition (two plugs per cylinder) stems from an era of very unreliable magnetos and plugs where ignition redundancy contributed to a noticeable improvement of the engine reliability. More reasonable, today, may be a technical requirement to ignite the mixture from 2 ends in the large combustion chambers where the flame propagation does not travel through the chamber fast enough. That is no justification to replace the extremely reliable battery/coil system of a less-than-200-cc engine by a sometimes-improvised dual magneto arrangement. It is dangerously questionable and only justified by tradition—I call that "Superstition Engineering."

If the two magnetos are driven by a common member (shaft or gear), the ignition reliability (and safety) is *reduced* by a factor of two: The dual load on the drive mechanism increases its probability to fail. If it does, both systems are useless. This becomes more serious when the drive gear is originally dimensioned to drive a distributer only. Two magnetos require a remarkable torque in an intermittent mode: a schoolbook set-up for fatigue failure.

The worst that dual ignition does

to small (500 cc per cylinder) engines is the second spark plug hole in the cylinder head. It weakens the head structure by about 1/3 (adds another hole to the three already there). The area between those holes in aluminum heads is susceptible to cracks (a very common failure mode on VW's). The subsequent head distortion causes misalignment of the valve seats which in turn causes the exhaust valves to leak and burn. One more hole creates two more probabilities for cracks. Fortunately, this failure mode does not manifest itself by a sudden total power loss—but why set it up in the first place?

To apply the lubricant requirement to motorglider engines is too outrageous to discuss here—an automobile engine operates satisfactorily under a much more severe attitude/acceleration environment than it would be subjected to in a glider.

After we determined what a motorglider should *not* have, let's look at the other side of the coin and see what it *needs* in terms of safety.

There is a population of some 1000 of various motorgliders in operation in Germany and Austria, so statistics become meaningful for analytical interpretation. The accident rate (mostly non-fatal crack-ups) is *higher* than for general aviation. These accidents do *not* occur on takeoff but, instead, in the landing pattern, in an unsuccessful attempt to restart the engine and subsequently landing short and hitting obstructions—or neglecting aircraft control when frantically jerking the lawnmower cord.

There are two important conclusions: (a) A motorglider is not only a self-launching sailplane (some do not even have that capability at all): the engine is used to get you home when the vertical activity quits. (There are other features which I would like to discuss some other time). By the time you realize the vertical winds *have* quit, you are rather low—let's face it. And (b) That engine better be available when you need it. The safety requirement, then, is: engine *start* reliability.

So let's see what is available: An FAA-approved and type-certificated aircraft engine with zero time SMOH on record, dual ignition, carburetor heat, you name it, is absolutely and unacceptably *unsafe*.

We have to define first what causes the probability of these motorglider-peculiar accidents: "Engine fails to start within, say, 30 seconds when called for"—that's about another 80 to 100 ft descent; you have to add a little more time for it to warm up and deliver power.

The failure rate of these approved aircraft engines in that mode is pitiful. I do not have a figure. Whoever wants to know it should take a notepad to a nearby airport on a Saturday morning and start a stopwatch whenever a pilot settles in the cockpit and calls out "clear?" The probability that such an engine will fail to respond within 30 seconds is just too high. The damage in foot-pounds is negligible; but many an accident could be traced back to pilot frustration getting off late and subsequent shortcuts in cockpit and flight safety.

Air start reliability of these certified engines isn't any better. Two recent stories: one fellow tried to revive an engine in a Cessna 150 after having it switched off for wave soaring. He used up several thousand feet of altitude in the process (see May issue of *Soaring*). Another who soared the Torrey Pines Cliffs in a *Citabria* with the engine off, used up his battery capacity trying to restart it, failed, dead-stick landed it and finally got the engine going again with the help of an automobile battery and jumper cables.

Paradox, as this may sound: don't look to the FAA certification process for your (motorglider) safety.

Where else do you go to find an engine with "Freedom from those conditions that cause injury...."? My advice: Look at engines that are produced in sufficient numbers to show the failure history, mode, rate, and trend. Small cars, motorbikes, snowmobiles—if they survived the market competition, their start reliability must be reasonably good. Talk to people that own and operate them. If an engine is troublesome, they will tell you in no uncertain terms. A sales pamphlet is no source of information. Even

the weights are wrong.

Whatever engine you contemplate for motorglider application *must* have a starter device that works without straining the pilot. I have not seen a recoil (lawnmower) device that doesn't. Your safety is worth the weight investment of the electric starter motor/battery/generator combination.

Do not change the ignition system. If it is a two-cycle flywheel magneto, it is probably capacitance discharge already (CDI). If it isn't and somebody told you that it can be started reliably within 30 seconds—better try that yourself.

Don't look for a fancy carburetor. If the engine comes with a membrane ("all attitude") carburetor—throw it away. They are too sensitive and fickle. That translates into low reliability.

The operating requirements imposed on your carburetor are much less than on a road vehicle in regard to attitude and load variations.

Disable automatic chokes. You need a choke, but the failure rate of automatic ones (failure modes: binding open or closed) is too high for safety—convert to manual.

If you replace or do surgery to the intake manifold, this will require new carburetor adaptation. That is a *big* job which requires knowledge and instrumentation (exhaust gas temperature). The job is aggravated by specific problems of engines with a low number of cylinders (that, too, would be a nice subject to discuss some other time).

A reduction gear (to improve propeller efficiency, ground clearance, mounting provisions) does not create any safety problems. The thrust load is removed from the crankshaft bearings; that's an improvement. The addition of reduction members (gears, V-belts) and associated propeller shaft bearings represent additional failure potentials, but an all-out failure is preceded by a long period of warning noises.

The lifetime of an engine does not enter this discussion as a factor; an automobile engine with a very poor wear record—to require an overhaul (rebore, bearings) after 30,000 miles (that's 600 hrs at 50 mph)—will be good for 10 years if you run it for 1.2 hrs each weekend. Do you think you do?

To conclude, here are some action items for the future:

The existing battery/coil ignition systems should be converted to CDI as soon as those systems have proven themselves on the market (Chrysler, Audi).

A generator/alternator should be found with a low output (four amps instead of thirty for small cars). The big ones are liable to ruin your battery by throwing too much current into it due to low battery voltage immediately after engine start. Remember: The battery is part of your air start safety.

Write to your government representative to get the FAA to recognize motorgliders for what they are: sailplanes with a better method of getting airborne and a potentially *better* safety record than that of sailplanes, once the air start reliability is established. Motorgliders are *not* "Utility" category aircraft—as the FAA considers and treats them now.

Use this report or clippings of it in the letter to your Congressman. My criticism of the FAA is serious: Safety cannot be achieved by indiscriminantly suppressing good concepts. That discredits true safety engineering and reduces it to merely peddling slogans. Ask your Congressman to investigate my credentials before he brushes this analysis aside as a crackpot's opinion.

Here is a pipe dream: After the FAA joing the international aeronautical community in recognizing the motorglider, it should go one step further and contract *Consumers Report* to conduct a series of tests on a number of engines in the 30 to 45 hp area suitable for motorglider application.

And a footnote: I did not include an analysis of fuel safety. It should not be neglected. However, on first cut, it looks like this: My ship carries a max of 3½ gal at a very impact-protected location. The Corvair automobile carried four times that much right at the primary impact point, and I didn't hear much noise about that even from Ralph Nader, although a metal car shell provides a reremarkable source for ignition of spilled fuel.

SIERRA CROSSING

by Jack Lambie

Saturday morning, a dismal overcast, tiny showers as I climbed out of Compton Airport heading north as low as I dared under the TCA. The big air carriers mateialized below the clouds over me as the immense sea of city slid by below. At the mountains north of Pasadena the clouds were still lower so I turned west past San Fernando Valley and then north again to try to make the desert through the pass.

Rain appeared on the canopy and streamed back. I was supposed to meet Charlie Webber and Mike Bittner in their RF-4D motorgliders at Rosamond Airport ten minutes ago and here I was dodging around the passes with at least thirty-five minutes more to go if I could make it at all. The clouds thinned as I flew north and soon a few holes appeared. A slight tug on the stick and the conversion of speed into height brought us into the world of light.

The clouds ended at the last range marking the San Andreas Fault line and beyond was the tan desert. At the edge of the clouds one little puff thrust higher than the rest and as I pulled up to go over I caught a glimpse of brush and ground. *Oops!* The little cloud had been filled with rocks as one part of the ridge stuck up higher than the rest. The hair on the back of my neck bristled when I thought what might have happened if I had decided to skim through that innocent little puff.

Rosamond Airport was off in the shimmering distance as I burned off altitude at 125 mph. I was ready to turn for a pattern when I saw the two Fourniers rising in tight circles over the runway. Charlie and Mike! Smiling and waving we moved together for the first three-plane formation of Fourniers in California history. I could see their gas tank wires standing high with full fuel so I motioned that I had only another hour left. Charlie and Mike graciously dropped their alighting mechanisms a few minutes later at Tehachapi Gliderport and we landed to the looks of the envious pilots awaiting tows.

On our way again Charlie and Mike told me to lead to the airshow at Merced and make it "an interesting trip." Mike Bittner had gotten his motorglider rather recently and although an ex-navy instructor with much experience he really hadn't yet seen how to get the most out of our magic machines. So I thought it would be fun to make a typical cross-country using the speed and soaring ability of the aircraft to extract the most possible efficiency and fun. The idea is to never use the motor to climb. Instead, the atmosphere is there to do the lifting and all the motor does is make the ship go forward. I headed straight for canyon sides and let the combination of thermals and slope winds carry us higher toward the tops of the southern Sierras. At the ridge line we brushed over the trees and surged up in the currents on the northwest sides. Into the lift and around and around to 10,000 feet and then off at a fast slant towards Merced 200 miles away. The Central Valley was covered with clouds at 8000 feet and since it looked hazy and hot below we could fly in a nice tight formation in cool comfort and smooth air by staying on top.

Mike is a superb formation pilot and he tucked in tight on my right wing with Charlie just behind. The rainbow-ringed shadows of our three planes raced over the white billowing clouds. The forested and snow-patched Sierras made a backdrop like an island or peninsula. That's one fun thing about flying. We knew we were over the California central valley west of the mountains but visually we were in a new land.

With joyous exuberance I eased into a big barrel roll and Charlie did an aileron roll and Mike zoomed into a perfect loop. We were kings of the sky. I remembered reading "Blackhawk" comic books in 5th grade. It was about a group of fighter pilots in black pursuit ships that went about like knights of the air righting wrongs. That's how I felt with our little group hi-jinking through our own private world of clouds.

At some point north of Fresno with only 40 miles to go I started a long gradual descent and we lost each other coming through the cloud openings, so I poked along gliding awhile and then circled in a thermal to look around. There they were scooting along only a quarter-mile away! Our skein of motorgliders coasted over the airport at Merced, squeezed into the infinite string of aircraft lined up for landing, popped gear down, spoilers open and made runway contact.

The CAP boys guided us to a spot next

to the F-51's and the Hawker *Sea Fury* and an MU-2 backed in on the other side using its reversed props. Two hours and nineteen minutes from Tehachapi, including soaring and stunting, and only 6.1 gallons of gas.

We wandered around the varied antique aircraft wondering at the incredible time and talent that had been lavished on some of them. A 1918 SPAD had been superbly rebuilt with every nut and bolt painted or polished to perfection. The struts and other woodwork were finished like fine furniture. The original French instruments were as new. It was fun to think of some out-of-the-way place, such as the tailskid mounting or something, and check it out to see if the rebuilders had neglected any single spot in their work of reincarnation. They had not.

There were about a dozen of the many machines on display that had comparable workmanship and detailing. The huge, thirsty, slow-speed engines pulled the draggy old machines through the air at speeds slower than the Fourniers. The big fighters were in another class entirely. These technological masterpieces of World War II with their taildragger gear, piston engines, and small tail surfaces are still pretty closely related to the older ships of a decade before and thus make a good study in progress.

Mike, Charlie and I walked around uptown Merced watching the local gang dragging the main. The social inertia of an agrarian town is such that it seemed the clock was turned back twenty years. We finally ambled over to the fairgrounds to have coffee and cake leftovers and listen to a talk by a wingwalker from Lindbergh's show back in the 1920's. It seemed strange that just the wonder of flight was not enough to excite people but they had to hang upside down from the wheels and change planes in midflight to keep interest up. The antique flyers seemed to be an older, more well-off group than the strictly experimental builder-flyer bunch. After the awards—that SPAD won, of course—Charlie and Mike caught the bus for the airport and I wandered to the fairgrounds racetrack. It was past ten and the ticket sellers were gone so I went in to watch the main event just starting. They had a total of six starts because they never got past the required laps before a big crash on one of the corners would bring everything to a halt. Eventually enough cars had been eliminated so there was room for the '60's era stockers to maneuver and the race rather anticlimactically concluded. Then I was treated to an action that would have warmed the heart of a Roman emperor. Fifteen cars lined up on the finish straightaway and at the wave of a green flag proceeded to smash into one another. At first it looked like a group of ants scurrying around from a broken nest banging and bumping one another. Soon little heaps of three or four smouldering machines abandoned by their drivers made hiding places for the few cars left to sally forth in individual combat. An old Ford Thunderbird that must have been made of Impervium delivered the *coup de grace* to the surviving Chevy stationwagon. The standing-room-only crowd streamed happily from the compound and into their cars for the drive home while I walked toward what I thought was the airport. Soon it was plain I was lost. I sat down by a liquor store digesting a beer in the warm thick night when a car full of black teenagers pulled up. I asked directions to the field and they said, "Come on man, we'll run ya over there." I squashed in the back seat with the celebrating group for a ride so reminiscent of my gang back in Illinois in 1949. I seemed to have stepped into a time machine. Up one street and down another the oil burning engine strained in second gear like a grandfather swinging the children around and chasing with them in the yard, its last overdone happy action. Incoherent shouts and whistles greeted other cars of peers that pulled alongside and finally a long stop in the middle of the street while people crawled back and forth between cars. Then on to the "Party" which was near the airport. I could see the beacon turning a few blocks away. Finally I walked down the rows of silent old biplanes and crawled into the sleeping bag under my wing until dawn when the "Wake up the Town Flyby" planes such as the P-40, F-51 types coughed into sputtering rumbling pressure waves and sailed forth in the red pre-dawn sky. As exciting and, well, OK, thrilling, as it was it still didn't allow sleep for anyone on the field so we got up had a stuffy-filling breakfast of pancakes, coffee, and sausage and decided to fly to Bishop before the Merced

field was closed for the airshow. We polished our canopies,pulled the props through.

"How many winds do you put in yours, Mike?"

"Double knots, Jack."

"Are you wound tight, Charlie?"

OK! Blackhawks Awaay! We float off the runway, circle for a formation flyby and head six degrees at 100 feet over the ground. It's strange, from the air Merced looks like any other city. Lots of new housing developments, shopping centers and, of course, the freeway. Soon we are rolling across the golden fields and as the first foothills appear we see a bunch of vultures circling. Wham, into the lift and the scenery circled carrying us up to the top of the first grassy hills, then on the oak-covered hills and another thermal, squirting out of a gulley carries us higher into the next range of piney ridges. More circles carry us across into the deeper canyons and winding roads of the serious mountains. Puttering up the canyons there isn't much lift so we tuck up against the side of a big hill and climb to cloudbase.

Now we're coming to big patches of snow as we head further east into the Sierra massif. Our engines run rough and at full throttle only 2600 shows on the tach because of the thin air and overrich mixture. The snowy peaks we must cross tower above the cumulus we have been soaring under. We run under one last cloud street and we're on our own to claw across the snowy mass.

Circling in each surge near the shear cliffs we climb higher. At 12,000 feet the cold air is still sparkling and bouncing with turbulence and lift. No roads below. There are icy frozen lakes on which it would be feasible to land, but how would you get out? Yosemite's valley and spurting falls is off to our north a few miles away. I could always glide over there if the bottom fell out, I guess. Mike stays with me circle for circle as we push further into the white rocky wilderness. He's got a lot of guts or trust or both, since this is his first flying like this.

Why does it seem so scary in the icy crags, cirques, and cols? The air is cold and super transparent but in our cockpits it is snug. It is as alien here as on top of a cloud deck. We lose each other for moments at a time as we circle and move from cliff to cliff in the dazzling arenas. Then I can see, far off, the Owens Valley. It is starting downhill now, we've crossed the Sierras. Mono Lake to the north of us is a giant mirror reflecting the cumulus clouds on its calm surface so different from my last trip coming down from a Minden soaring contest when the Fournier in minutes was alternately thrown within a few hundred feet of the water and then tossed up to 19,400 in the wave. I snap some pictures of Mike's white and red RF-4D among the snow fields. It's a lot more fun with the other planes because you not only are enjoying your adventure but can also see another identical plane with you so it's experienced from both points of view.

Mike veered off to the north to find Charlie. They had radio and couldtalk to one another. I shut off and glided to Lake Crowley, circled with some big white pelicans and headed down the cloudstreet to Bishop airport. I spent so much time circling and gliding I was sure I would be last but on the field there were no Fourniers to be seen. Not wishing to restart, pure laziness, I put the wheel down and glided to a landing. As I climbed out Charlie and Mike landed.

Walt Lockhart, our glider pilot friend of many years, picked us up and let us use his van to go to town for lunch in return for a flight in Charlie's ship. An hour later when we returned we called him on the radio and he reported cloudbase at about 14,200 ASL. He landed and kissed the cowl before climbing reluctantly out. We topped off our tanks, I used two gallons less than Mike—ha ha—and taxied out for a formation takeoff.

Charlie led off on takeoff as usual since he has a 1700 cc VW engine instead of the 1192 cc of mine and Mike's. He started a circle as soon as he broke ground so we could gather up behind him and as we bunched together in our 360-degree turn between the runways we found a thermal of 1200 feet per minute. Twelve minutes later at 14,000 feet we headed for Mt. Whitney. We were feeling pretty smug thinking how we must have looked to the people at the Bishop airport. After all, their airport over 4000 feet does not usually see little low-powered planes climb out at 1200 feet per minute. At the steep Sierras we circled and glided along the rocky cliffs

heading south. I got under a particularly promising cloud and lost Charlie and Mike. We were going to Whitney so I headed on down. Since Whitney was higher than the cloudbases I flew along the edges of a row of cu sitting just on the lee side of the peaks. There was enough lift to climb alongside them to 15,220 ASL and soon I was over the tin house at the highest point in the 48 states. It looked very cold and lonely up there but bouncing around in the currents on the lee side I was still more than comfortable in the warm cockpit. At these high altitudes things look very bright and sparkly and the grandeur is such that it's hard to form proper orientation to sizes and distances. Far below the hot, relatively hazy valley was a different world.

I pulled off the gas valve, let the engine die and flicked off the ignition. By slowing and pulling up in thermals and gliding at 65 mph between bumps Inyokern airport was reached with over a thousand feet above the ground. Wow, 28-to-1 glide ratio. A tailwind and upcurrents do help. A slow easy pull on the start lever and the engine began spinning the propeller again. At 150 feet I bounced along over the desert toward El Mirage. It was so rough and turbulent I just sat back and let the ship bounce and slide. It was kind of fun and relaxing after a while. I pretended I was a pure glider and set up a couple forced landing patterns for practice. The best way is to throttle the engine way down and try to glide to a good landing spot and drop down almost to flare-out height before adding power. That's what is fun about flying. You can do whatever you want, point the nose where you want to be, tilt and turn, swing around and go up and over—truly what we mean by freedom.

I swished low over a group of motorcyclists in a gulley tearing up the desert. They never looked up so quiet was my passage. Then across El Mirage Dry Lake where the wind was blowing fine dust and a quick slow landing into the gusty stuff at the gliderport. The glider pilots who had driven up through the Cajon pass earlier reported very poor conditions with clouds and heavy smog so I left very quickly. I might have to come back....

At Cajon Pass the white mass spilled up over the edge like a giant's bowl of oatmeal and as the 1000-feet-per-minute up current at the edge lifted me to 6000 ASL I could see it seemed to cover the entire lower basin. As I continued over the white glaring stuff I saw dimly ahead that it did end at San Bernardino so I shut off and glided to Flabob, settling lower into the smog until visibility was only a mile in the coppery setting sun. Ten minutes after I landed Charlie came in after escorting Mike past Compton.

Relaxing at dinner that night we talked of our exciting weekend. the formation flying to Merced, the snowy dazzling high Sierras, coming back in the clouds and smog, the beautiful airplanes and many friends we had seen—adventures of great variety and satisfaction in our clean, little motorgliders.

MORE ON BURG FEUERSTEIN

In the June 21, 1973 *Flight International*, Peter Ross writes about the May 27-June 3 motorglider championships at Burg Feuerstein. He reports that Helmut Reiter, now an engineering consultant in Munich, is putting a 55-hp Hirth engine into a *Standard Cirrus* fuselage. Willibald Collee is planning to use the same design in a 22-meter *Nimbus*, to be ready next year. The two are working closely together.

Ross also reports that Scheibe is working on a *Bergfalke IV* with retractable motor. This is a two-place sailplane with a 34-to-1 max L/D.

That the SZD-45 two-place from Poland did not make an appearance was disappointing to Ross.

Ross reported on other equipment and the competition, stating that 50 motorgliders were at Burg Feuerstein, and 24 were competing in the three classes.

Ross noted that prior to the contest Gerhard Stolle had flown a Scheibe SF-28A Tandem around a 300-kilometer triangle for a new German record, the first such flight by a two-seat motorglider.

STATIC THRUST MEASUREMENT

by Steve du Pont

To calculate takeoff run and taxiing possibilities, and whether we should use reduction geared (belts) propellers in powered sailplane homebuilt or home installations one needs some knowledge of static propeller thrust. Stan Hall has given in the August *Sport Aviation* some insight into this for the VW geared and ungeared engines, but we need it for the snowmobile types such as 400 cc 30 hp at 5500 to 6000 rpm types. These engines would seem to need propellers of over 50 inches diameter if geared, and not over 30 inches in diameter if direct drive, the latter figure guess-timated and looking terribly small to this writer. Hovey doesn't help us much in the static thrust department.

Could somebody help?

It is supposed that the static thrust will be larger than the thrust at higher speeds. 30 hp would probably give well over 100 pounds, depending on whether and how geared, and what speed the most efficient operation is designed for. VW installations according to Hall will give less than 250 pounds direct and more than 250 pounds geared.

This writer recommends care in mounting propellers directly on engine crankshafts due to the gyroscopic loads not intended to be put into shafts and the lack of proper thrust bearings. Plenty of ground testing would seem necessary on some kind of a *mobile* rig to safely prove such installations.

It is suggested that some tests be run by owners of AS-K 14 and M-Zugfogels and whatever other powered sailplanes are around. A sketch of how to rig the the pull tests and a list of data required are below.

I will gladly receive any test data, and try to pick up any questionable or missing numbers, and will compile the results for *Motorgliding* if readers will send it to me. Don't put it off, do it now.

Get someone who knows how to do this kind of thing, if you don't, to supervise. The problem may be that you haven't got a scale strong enough to measure the pull.

Call the local scales man who may be listed in the yellow pages and see if you can borrow a tension scale large enough. If it is a VW-powered machine with geared prop you may need a scale able to hold 250 to 300 pounds. If it is a small two-cycle engine such as in a AS-K 14 or Zugfogel it will probably require over 100 pounds, possibly 150.

If you can't get large enough scales, you can rig a lever per the sketch. Attach the anchor ropes to fence posts or the like flat to the ground and let the lever lie on the ground. The scale anchor rope and the tension rope to the tailskid of the airplane must be parallel during the test. All the ropes will best be parallel. Use a strong enough lever such as a 2 x 6 made of clear strong wood. The ropes, for safety and considering that the knots will weaken them, must be 5/16-inch nylon or 3/8-inch manilla. Glider towrope will do and had best be doubled.

The sketch is a top view of the lever and ropes as they lie on the ground during the test. Be prepared for a rope break. Lie the scales on the ground protected by a piece of plywood or canvas.

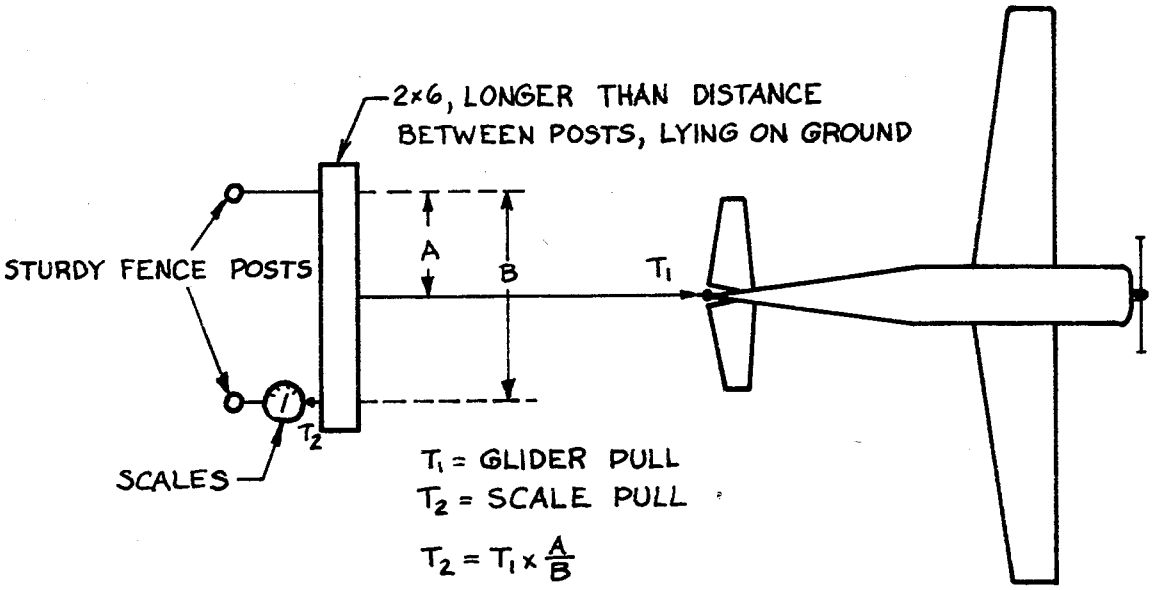
Note the angle of the propeller to the ground as it will probably have a nose up attitude and this will introduce some error.

Measure the tension and rpm at full throttle. Note any wind. Try to do it in no wind. Photograph the details of the test rig.

STATIC THRUST DATA NEEDED:

1. Make and model of engine.
2. Displacement of engine. No. of cylinders.
3. Two or four cycle?
4. Rpm at test. (Engine or prop? state which).
5. Propeller diameter.
6. Propeller pitch. If you don't know that, measure the angle in degrees of the flat bottom back side of the propeller blade at 75 percent of the blade radius from the center of the hub.
7. Propeller material: wood, metal, plastic...
8. Is it noisy?
9. Do it in no wind.

10. Gear ratio. That is number of engine full and fraction turns for one turn of the propeller.
11. A photo of the propeller installation and the glider.
12. A photo of the test setup. Send to: Stephen du Pont, 160 Long Meadow Rd. Fairfield, Conn. 06430, for comp ation for *Motorgliding*.
13. A power curve of the engine from manual if there is one.
14. Addresses of engine maker and peller maker.



STATIC THRUST TEST SET-UP

LETTERS (continued from page 2)

to do this (swallowing pride) and scratch the badge or goal attempt than to lose the rest of the soaring season or seasons. Overconfidence in re-starting a hot 2-cycle is no excuse for making an unnecessary off-field landing.

Yes, I surely agree that dual wheels, even close together, are far better than one, and perhaps far better than two spaced apart the normal Piper/Cessna distance. My retractable-extendable wingtip wheels allow great cross-wind takeoffs and landings in a manner that is strictly heretical in the conventional piloting sense. With the *leeward* or *downwind* wingtip wheel on the ground (you have no choice), the powered sailplane will taxi beautifully in a 20-knot cross wind with a three point stance that consists of a triangle 25 feet by 15 feet; main gear, tip wheel, and steerable tailwheel all on the ground. With stick full back, the downwind wing will only when it wants to, and this is you have perfect aileron control (s into the wind). Only once did I happ to have someone run the *upwind tip* t had a problem; once he let go, the *dow* tip hit the runway hard after the win caught the windward wing. I feel tha closer the wheels, dual or single, a the CG, the better, as a sailplane has powerful flight controls.

One new, or maybe not so new, pr with the truly independent powered plane: Lack of properly qualified (or witnesses for a badge or goal flight am sending along a copy of a barog trace that would qualify for Silver tude but no witnesses, as I went out during the week without anyone aroun miles.

Bill Mouton
Metairie, Louisian

Editor:

For a long time, we have been reading your publication with great interest, in particular, of course, your articles about the development of motorgliders in Germany.

Your publication in the February edition regarding the meeting at Burg Feuerstein deals—besides other subjects—with the motorglider *Sirius I*, which we manufactured, and we should like to draw your attention to several items we should like to rectify, so that your readers are at any time well-informed.

The motorglider *Sirius I*, which was presented last year, is a test unit for the "integrated ducted fan", a propulsion unit developed by our company. This propulsion unit, for which we used Wankel rotary engines, was developed with the financial assistance of the German Ministry of Economics, and the costs were naturally very high. However, we want to point out that the motorglider *Sirius I* was financed by our company alone. We would, therefore, be very grateful to you if you would correct the respective remark of your February edition accordingly.

Regarding the high noise level you also mentioned, we should like to inform you that now the motorglider meets with the noise prescriptions of our German Air Navigation Office, after termination of several measurements.

When flying 300 meters above with travelling performance, the result of the measurement was 64 db (A), whereas the maximum value allowed by the regulations would be 68 db (A). The motorglider *Sirius I* is equipped with the wings of the sailplane FK-3. As this model is no longer produced in series, there are no wings available any more, so that also the *Sirius I* cannot be manufactured in series, in spite of the lively interest it receives. However, there might be the possibility of our taking up production again, as soon as suitable wings are available.

The report of Dr. Sonzio—with whom we have very friendly relations—mentions several times the *Sirius II* and *III*. This is obviously an error, and we would ask you to inform your readers of the following:

The model *Sirius II* was equipped with the wings and tail section, furthermore with a part of the fuselage front section, of the well-known sailplane *Calif A-21* of Messrs. Caproni Vizzola. We feel that Dr. Sonzio, being the designer of this model, was talking in the interview about the *Calif A-21* and *Calif A-21 J* (with jet-engine).

An agreement between Messrs. Caproni and our company says that our company, Rhein-Flugzeugbau, manufactures the motorglider model of the *Calif A-21* with ducted fan propulsion. This model, which has the same propulsion system as the *Sirius I*, was named *Sirius II* because of its two seats. There is no model *Sirius III* yet, but further development in this direction may come, because the propulsion system has proven to be successful throughout approximately 150 flight hours....

Rhein-Flugzeubau GMBH

Editor:

Following an invitation from Tasso I did push the starter button in his *Kraehe*, successfully replacing the usual tow plane and, in the absence of fair thermals that day, climbing a few times to a comfortable altitude and inspecting the sites around Hemet for future use—if he should invite me once more. I like that button! No forgetting to release the tow line and no dependence on that last thermal or slope elevator.

The *Kraehe* approach to soaring makes good sense for many, but especially at the age when the income gets smaller and the bones more brittle. More elegant design solutions can be found; after all, the various power arrangements are not a reserve of expensive fiberglass structures.

I enjoyed your stories on Tasso Proppe and note that his activities are reaching surprisingly far. He uses two motors, one in his car for penetration and the one in the *Crow* for elevation, recreation and salvation. My old friend has a good thing going.

Willy A. Fieldler
Los Altos Hills, California

Editor:

Because of the cost I will probably never own a store-bought airplane but the idea of a homebuilt keeps my hopes alive.

The thought occurred to me that the simple-to-build features of the Pazmany

port which is more inconvenient, more expensive and more hazardous.

4. Overall utility. There are occasions—such as report of a missing aircraft—when human life depends upon the availability of as many aircraft as possible for search and rescue. The "low and slow" capability of auxiliary powered sailplanes makes them especially useful for such operations. I would not be very helpful in searching for a downed aircraft while spiraling in a thermal; I would be extremely effective flying the SF-25A under power a few hundred feet above terrain at speeds of 40-60 mph.

For these reasons, then, I hope that the FAA will avoid placing an arbitrary fuel limitation on auxiliary powered sailplanes. Thanks in advance for the careful consideration I am sure you will give to my reasoning.

John A. Wallace
Putney, Vermont

Dear Mr. Baker:

I am a "powered sailplane" pilot, and own and fly a semi-high-performance (L/D 34:1), "self-launching-sailplane", the Scheibe SF-27M, N-80AR.

I am of course greatly interested in the NRPM governing the design, manufacture, and use of such craft as reported in the May 1973 issue of *Motorgliding*.

Up to the present time, I have had some wonderful experiences and flights in the SF-27M, along with extremely good cooperation from our local GADO office, and have the ship licensed in the Experimental/Exhibition Category.

In regard to the proposed rules, I would like to make the following points:

1. Except for the tremendous effort and cost put forth by Ted Nelson and Harry Perl, in certification of the two-place *Hummingbird* self-launching-sailplane, other possible U.S. aircraft manufacturers, including the only major sailplane factory here, have been discouraged in development of powered sailplanes due to the "vacuum" that exists in present rules, which currently make the "SLS", commercially speaking, both illegitimate and uneconomical. *(Actually, the* Dragonfly *was the only auxiliary powered sailplane to receive an ATC—Ed.)*

2. The unrestricted design and development of "pure", high-performance sailplanes has had a considerable impact and proven value in the recent and current design-aerodynamics employed in many aircraft now flying constructed in the last decade.

3. Existing high-performance sailplanes with "exotic" glide ratios of over 40/1 are stirring the imagination of aircraft designers at this present minute in time.

4. It is therefore important that any rule-making or proposed legislation *does not* inhibit or restrict the aerodynamic design possibilities inherent in the relatively "undeveloped" area of self-launching sailplanes.

To further elaborate on this, I would hope that you take into account, very seriously, my humble suggestion that the "rules" be applied to the "pilot", and aircraft "equipment", rather than the aircraft itself. By this I mean to show that it may be very "dangerous" to limit the fuel supply to only one-hour's duration. I can assure you that on takeoff, you need this much fuel just to "slosh-around", and this kind of negative thinking may result in a good many fuel-starvation *accidents*.

Further, there are many self-launching sailplanes flying in the United States that are far safer than the typical *Cherokee 140* or Cessna 150, assuming that all engines will not run forever without failure. The Nelson *Hummingbird*, the Fournier RF-4, the RF-5B, the Schleicher AS-K 14 and the SF-27M have lower takeoff and landing speeds, better engine-off glide ratios, better glide-path control for landing, and better pilot visibility than the majority of current light aircraft. In fact, any of these aircraft can "abort" a takeoff at any point of a 3000 foot runway without disaster, which cannot be said for conventional ATC'd aircraft.

Therefore, it can be shown, by actual demonstration, that the existing self-launching sailplanes, now operating, listed above, are safer than conventional aircraft and pure gliders in both the takeoff and landing modes, since the SLS has better glide-path control than general aviation aircraft and engine restart capability in event of a "low pat-

PL-4 would make a dream come true if it could somehow be transformed into a motorglider. Is this in the realm of possibility? If so, I'm sure it would appeal to others as well as myself. I would appreciate hearing your comments.

Thank you.

J. E. Necessary
Arkadelphia, Arkansas

Would a reader care to comment?—Ed.

Some of the people who have written to the FAA concerning the upcoming rulemaking on motorgliders have sent copies of their letters to us:

Dear Mr. Baker:

I am writing to comment on what I understand is a forthcoming NPRM concerning Auxiliary Powered Sailplanes. Just a few days ago I accepted delivery in Boston of a used (1966) SF-25A Scheibe *Motorfalke*. Living as I do in a rural area the 30-hp engine in this aircraft offers me a long-awaited independence from towplanes, towropes, winches, ground handlers, etc. Its aerial restart capability also assures far greater safety in an area such as Vermont where the flat expanses of farmland which characterize some areas of the United States are few and far between.

Clarification of the regulations concerning Auxiliary Powered Sailplanes is certainly to be welcomed. I find it somewhat restrictive, for example, to be told that my aircraft must be classified as "Experimental" and that I cannot even take my wife up for a ride until it has accumulated fifty flight hours. This despite the fact that it has been flying successfully and safely in Europe since 1966!

However, as I study the report in the May issue of *Motorgliding* which summarizes what is alleged to be "Present FAA Powered Sailplane Proposal Thinking" I am very much disturbed by the suggestion that such aircraft have a fuel tank maximum useable capability for takeoff and climb to 4000 feet.

I assume that the purpose of such a provision is to assure that sailplanes are not used for cross-country transportation and their possible mix of 60-mph sailplane traffic with 250-mph commercial aircraft in the vicinity of controlled airports. In view of existing regulations with reference to radios, transponders, flight plans and the like it would seem that there is little likelihood of sailplanes impinging upon controlled areas.

On the other hand, it seems to me that there are several valid reasons for avoiding the imposition of a limit on fuel capacity.

1. Safety. The aerial restart capability of auxiliary powered sailplanes should materially eliminate the hazard of off-field landings. A friend of mine recently died as a result of injuries suffered in an off-field landing. With a powered sailplane he could have restarted when he found himself in difficulty—but not if he had already used up a restricted amount of fuel in making his original takeoff and climb.

2. Instruction. One of the major advantages of the auxiliary powered sailplane is its economy of operation. If the present "Experimental" restrictions are removed from such aircraft, they can be used in the United States, as they are in Europe, for low-cost instruction of the tens of thousands of young people who would like to learn to fly but cannot afford the $20-30 per hour rates of most flight schools. If one is using a two-place sailplane for instructional purposes, however, the proposed limitation of fuel capacity would clearly be a handicap.

3. Ecological considerations. In a time of growing fuel shortages and widespread concern over air pollution, the auxiliary powered sailplane should have great utility. My SF-25A gets 30 miles per gallon. When I disassemble it and trailer it behind my car, I get 18 miles to the gallon—and the combined 50 foot length of car and trailer presents an obvious hazard to other motorists. Why deny to the powered sailplane owner (and to society) the fuel savings possible if he/she can use such aircraft for movement from point A to point B. In the state of Vermont, for example, there are two soaring centers, roughly one hundred miles apart. Under the fuel limitation proposal, I would not be able to fly my SF-25A from one to the other but would be required to use highway trans-

port which is more inconvenient, more expensive and more hazardous.

4. Overall utility. There are occasions—such as report of a missing aircraft—when human life depends upon the availability of as many aircraft as possible for search and rescue. The "low and slow" capability of auxiliary powered sailplanes makes them especially useful for such operations. I would not be very helpful in searching for a downed aircraft while spiraling in a thermal; I would be extremely effective flying the SF-25A under power a few hundred feet above terrain at speeds of 40-60 mph.

For these reasons, then, I hope that the FAA will avoid placing an arbitrary fuel limitation on auxiliary powered sailplanes. Thanks in advance for the careful consideration I am sure you will give to my reasoning.

John A. Wallace
Putney, Vermont

Dear Mr. Baker:

I am a "powered sailplane" pilot, and own and fly a semi-high-performance (L/D 34:1), "self-launching-sailplane", the Scheibe SF-27M, N-80AR.

I am of course greatly interested in the NRPM governing the design, manufacture, and use of such craft as reported in the May 1973 issue of *Motorgliding*.

Up to the present time, I have had some wonderful experiences and flights in the SF-27M, along with extremely good cooperation from our local GADO office, and have the ship licensed in the Experimental/Exhibition Category.

In regard to the proposed rules, I would like to make the following points:

1. Except for the tremendous effort and cost put forth by Ted Nelson and Harry Perl, in certification of the two-place *Hummingbird* self-launching-sailplane, other possible U.S. aircraft manufacturers, including the only major sailplane factory here, have been discouraged in development of powered sailplanes due to the "vacuum" that exists in present rules, which currently make the "SLS", commercially speaking, both illegitimate and uneconomical. *(Actually, the* Dragonfly *was the only auxiliary powered sailplane to receive an ATC—Ed.)*

2. The unrestricted design and development of "pure", high-performance sailplanes has had a considerable impact and proven value in the recent and current design-aerodynamics employed in many aircraft now flying constructed in the last decade.

3. Existing high-performance sailplanes with "exotic" glide ratios of over 40/1 are stirring the imagination of aircraft designers at this present minute in time.

4. It is therefore important that any rule-making or proposed legislation *does not* inhibit or restrict the aerodynamic design possibilities inherent in the relatively "undeveloped" area of self-launching sailplanes.

To further elaborate on this, I would hope that you take into account, very seriously, my humble suggestion that the "rules" be applied to the "pilot", and aircraft "equipment", rather than the aircraft itself. By this I mean to show that it may be very "dangerous" to limit the fuel supply to only one-hour's duration. I can assure you that on takeoff, you need this much fuel just to "slosh-around", and this kind of negative thinking may result in a good many fuel-starvation *accidents*.

Further, there are many self-launching sailplanes flying in the United States that are far safer than the typical *Cherokee 140* or Cessna 150, assuming that all engines will not run forever without failure. The Nelson *Hummingbird*, the Fournier RF-4, the RF-5B, the Schleicher AS-K 14 and the SF-27M have lower takeoff and landing speeds, better engine-off glide ratios, better glide-path control for landing, and better pilot visibility than the majority of current light aircraft. In fact, any of these aircraft can "abort" a takeoff at any point of a 3000 foot runway without disaster, which cannot be said for conventional ATC'd aircraft.

Therefore, it can be shown, by actual demonstration, that the existing self-launching sailplanes, now operating, listed above, are safer than conventional aircraft and pure gliders in both the takeoff and landing modes, since the SLS has better glide-path control than general aviation aircraft and engine restart capability in event of a "low pat-

tern" when compared to the pure sailplane.

Since, in my opinion, the safety aspects of the landing and takeoff modes of flight for self-launching sailplanes can be demonstrated to equal or exceed existing criteria for conventional aircraft *or sailplanes*, it would seem that the major concern that your office and general aviation should have is in the soaring or cruising mode of flight.

I would certainly share your fears about having an unqualified low-time glider pilot cruising up and down the airways without proper training or navigational equipment in the aircraft.

This situation would not be too unlike the typical ASEL VFR pilot getting involved in an IFR situation. The point here is, although the *pilot* may not be qualified, the *aircraft* might well be equipped for instrument flight.

With this point in mind, it is important to know that highly reliable, aircooled, dual-ignition, lightweight Wankel engines are now being designed and tested of single and multiple rotors, which, when mated to a properly designed high-performance single or dual seat sailplane-type aircraft, that new configurations of self-launching sailplanes will appear on the scene with climb, cruise, soaring and landing capability that will exceed the accepted performance of today's production aircraft.

The "safety" aspects of this type of aircraft should delight both the public and the Federal Aviation Administration. For instance, with my SF-27M, I can demonstrate that it is possible to fly cross-country and remain within the safe gliding range, engine off, of the last airport flown over, or the one ahead, or at some times, both. This aspect of flight is not possible for existing general aviation aircraft flying below 10,000 feet.

I would therefore propose that "self-launching sailplanes" be licensed in TWO categories:

Category 1: Soaring: Self-launch, soar, self-retrieve.

Category II: Cruising: Equipped for VFR flight rules.

In my opinion, the term Auxiliary-Powered Sailplanes should be stricken and this type of development *should not* be encouraged. Gliders or sailplanes with minimal power that would prevent safe takeoff and climb should merely be licensed as "Gliders", in the "Experimental" Category. This type of aircraft is not being recognized by the FAI as far as motorgliding records are concerned.

Therefore, Category I, Soaring SLS aircraft would serve the primary purpose of legalizing and commercializing SLS instruction and flight in known and or remote soaring areas. The fine record and example of the SF-25B in England is well known and published.

Category II would encourage the best of both worlds and would be generally unrestricted if flown by properly trained and qualified pilots. The SFS-31, RF-5B, Schleicher AS-K 16 and *Sirius II* are existing aircraft capable of good performance in this category.

In conclusion, it is my sincerest hope that the proposed rules will give due consideration to self-launching sailplanes presently flying, along with the great benefits that may be reaped in flight instruction and airmanship by our young pilots-to-be, to say nothing of the great safety and technological advances that may be made in this field by only a simple and positive approach to your proposed rule-making.

Bill Mouton
Metairie, Louisiana

CLASSIFIED ADS

NELSON *DRAGONFLY* N34919. Rare, historic ATC'd side-by-side powered sailplane has new Winter vario, helicopter airspeed; C-12 altimeter, Hobbs meter, etc. Stits Poly-Fiber tests 40#+. Open trailer. Needs some work to fly again but basically sound. $1200/offers. No trades. NELSON H-59 ENGINE. Similar to current H-63CP, 48 hp, but has single magneto ignition, no starter or generator, not ATC'd. Less than 8 hours since new. $900 including freight in U.S. is less than half the price of a new H-63CP. Special deal for both of the above: $1950. W. Kirkland, 1371 N. Grove, Upland, Ca. 91786, or phone (714) 982-0330 evenings.

POSTFLIGHT NOTES

As noted elsewhere, I have been appointed Editor of *Motorgliding*. The magazine shall continue as it has evolved over the last few months in format, and, hopefully, in content. I hope to continue to receive articles and letters from those of you who are doing the dreaming, designing, building, and flying of motorgliders. Readers want to know how others are solving problems, so keep writing. I also hope to hear from those who want to help chart the future course of motorgliding in this country, in areas of airworthiness, aircraft and pilot certification, operation under the FARs, training, and competition. News from abroad is also needed (in English, please). And send in some cover photos (8 x 10 black-and-white).

At the August 3 SSA Directors' Meeting, Bernald Smith, Chairman of the Development Board, recommended that SSA maintain continued contact with FAA concerning new rules for self-launching sailplanes (see May 1973 *Motorgliding*). Sam Francis, Chairman, Governmental Liaison Board, and Dick Schreder, Chairman, Airworthiness and Certification Committee, will do so. Notice of Proposed Rule-Making is expected this year.

Dick Henderson has forwarded to *Motorgliding* a letter from Kiekhaefer, in which they state that they have terminated work on engines for man-carrying aircraft.

Comments on renewal letters: "Publish information on jet engines for gliders." "Illustrate mechanical set-up for engine retraction mechanisms." "Publish all you can about propellers developed for motorgliders—price, availability, etc." These are pretty tough to satisfy—can you help?

Coming—a report on the July Sugarbush motorglider meet, by Bob Tawse; on ferrying an RF-5B, by Bill Richards and Bill Nutting; and....

Donald P. Monroe

Motorgliding
c/o The Soaring Society of America, Inc.
P.O. Box 66071
Los Angeles, California 90066

Second Class Postage Paid
At Santa Monica, Calif.
And At Additonal
Offices

12 MG
1

Return Postage Guaranteed
Address Correction Requested