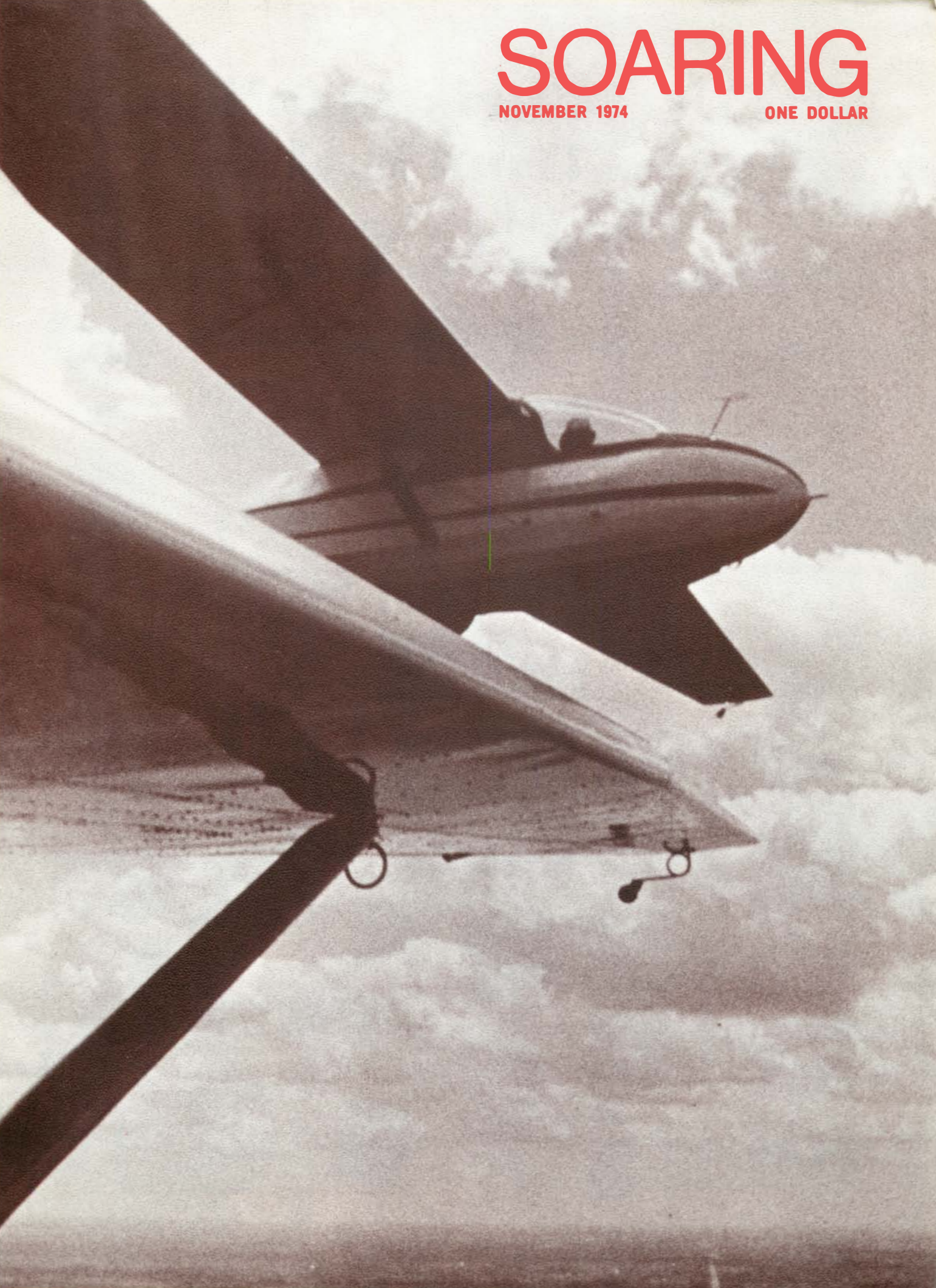
SOARING

NOVEMBER 1974 ONE DOLLAR



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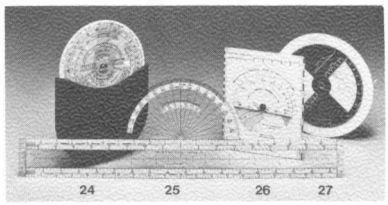

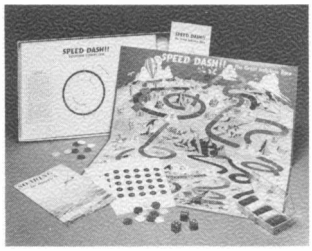

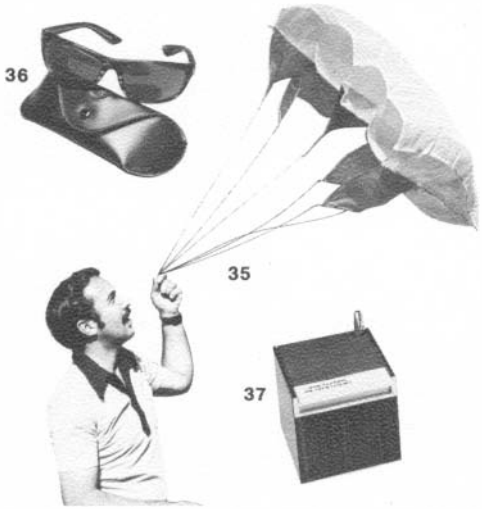

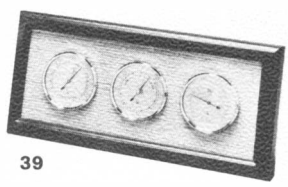

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SOARING

THE JOURNAL OF THE SOARING SOCIETY OF AMERICA

The Soaring Society of America is a division of the National Aeronautic Association (NAA), which is the official U.S. representative of the Federation Aeronautique Internationale (FAI, the world governing body for sport aviation). The NAA, which represents the U.S. at FAI meetings, has delegated to the SSA supervision of FAI-related soaring activities such as record attempts, competition sanctions, issuance of FAI Badges, and selection of a U.S. team for the World Soaring Championships. SOARING is the Society's official journal.

VOLUME 38 NOVEMBER 1974 NUMBER 11

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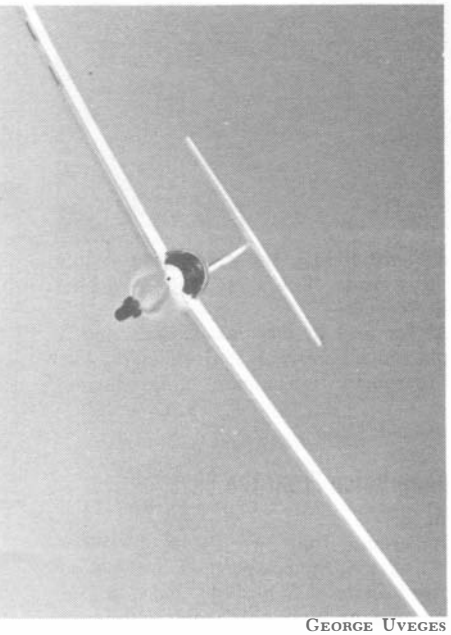

GEORGE UVEGES

Cover: A Savage encounter—the wing in the foreground belongs to a 2-33 piloted by SSA Ohio State Governor, Mark Savage. Russell Savage, above, is posing his 2-33 for a photo which was used on the cover of the Columbus Dispatch Sunday supplement.

SSA business and editorial office: 3200 Airport Ave., Room 25, Santa Monica, Calif. Mailing address: P.O. Box 66071, Los Angeles, Calif. 90066.

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LETTERS to the editor

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TELEPHONE NEWS SERVICE

Attention is called to the after-hours recorded telephone news service at SSA headquarters. Latest developments in the soaring world are recorded on tape every Friday (more often during major contests). The number to call is (213) 390-4449, between the hours of 6:00 p.m. and 8:00 a.m., Los Angeles time, and all day weekends. To reach a staff member who might be in the office during these hours call (213) 390-4440. If you call the first number for the tape, and don't get it after two rings, hang up, because it means it isn't in operation or someone else is listening to it. If you stay on the line you'll then be on the second number (through a rotary system) and may get a staff member instead.

Ridge Soaring at Black Springs

Dear Sir:

Now that *Soaring* readers have become acquainted with Waikerie, they might be interested in a glimpse of another soaring site here in South Australia. The enclosed photo of a ridge-soaring *Libelle* 201B was taken at Black Springs during the Ridge and Wave Soaring Safari run by the Adelaide Soaring Club in June 1974.

STUART YOUNG

Glenelg East, South Australia

Crewperson? Egad, Sir (or Madam)!

Dear Sir:

In this year's story about the 41st National Soaring Championships (*Soaring*, Sept. '74) one cannot overlook the fact that someone doesn't like the crewgirls, i.e., the female crew members. All of a sudden, throughout the article they are being referred to as a crewperson. As far as one can remember we had, and still have, crew chiefs and crew members who are either crewmen or crewgirls (crewgals if not a youngster).

It appears that some "unisex" hypocrite is trying to tell us that we should ignore the sex of a human being—even in soaring.

The person responsible for this nonsense in the article should write some stories for a rodeo or western magazine and refer to the cowboys and cowgirls as a cowperson! I wouldn't be surprised to see this dude being roped up in a hurry.

Let's keep such nonsense out of soaring and *Soaring!* May the person responsible for this crude offense get stuck in a blue hole—forever!

As for myself, *vive les femmes!* and it applies to all crewgals and crewgirls, too. No reason to discriminate against them.

S. O. JENKO

Mansfield, Ohio

A Deep Voice From the Sky

Dear Sir:

It seems that we have forgotten our basics ("Space-speed & Downwind Turns," *Soaring*, Sept. '74). Newton said that a moving body will continue to move in a straight line unless forced to move in a crooked line. He also said that if a body is really moving in a crooked line (not merely observed to be doing it by the town drunk), it can be guaranteed that some other body is also moving in an opposite crooked line. Also, there is an exchange of energy between these bodies (let's call them systems), with the total amount of energy being conserved. Of course Newton couldn't prove any of this, so we call his claims "laws" for lack of a better name. As soon as *they* are disproven, the world will be a much better place to live in, particularly for glider pilots. Can you image positive L/D?

A sober observer on a third system might conclude that the systems mentioned above are exhibiting strange behavior. Before he gets too upset, he should check his store of kinetic energy to see if any changes are going on. (Whenever my car is stopped at a red

light and an adjacent car starts to move, I check my kinetic energy by a reflex pressing of the brake pedal. If I don't go through the windshield, I know that I am not a relevant system, only a nervous observer.)

When flying an aircraft, I study my ground course for clues as to wind conditions, not as a criteria for coordinated flight. Admittedly, I have to remind myself that as long as I am not screeching a tire, rubbing a wingtip, or experiencing ground-effect, I can only exchange energy with the earth by falling up or falling down. To do this I utilize aerodynamic forces to direct my velocity to produce climb or sink. If I lose this ability as a result of a stall, then the element of choice is gone.

The other day the smog made it possible for me to experience a strong lateral shearline (negligible vertical components). As you all know, such a phenomenon is very rare. I carefully manipulated the control surfaces of the aircraft so as to maintain a constant groundspeed as I passed through this rare form of shearline. If the FAA examiner present had been watching the gauges at the time, he would have complained about a sticking airspeed indicator. Instead, he commented that there should have been a good bump.

Shortly afterwards, I observed another rare phenomenon, a lateral dust devil (negligible vertical components). The examiner said, "Look at the thermal! Let's soar." So in we went. Our projected ground path showed that we were circling tightly. The horizon was moving rapidly, and the ball was centered. But our degree of bank seemed strangely shallow considering the circumstances. In the still air outside the dust devil, we set up the same circling ground path. Our airspeed was lower, and the bank was steeper. It was as if the whirling air in the devil provided a constant crosswind that helped me.

I got a real scare when I came in to land. By then the afternoon wind was very strong, and I knew there would be a strong groundshear. My final was steep and perhaps too slow. I experienced an awful downdraft and the ship stalled. I oriented the nose straight down, but still was merely falling at one *g* as evidenced by things floating in the cockpit. This brought me enough airspeed to flare before crashing. So help me, that downdraft must have entered the ground and continued on to China. Maybe there is such a thing as an "air pocket."

My paranoia was building. I expected to hear a deep voice from the sky say, "There is something about you that irritates me." After reading in September *Soaring* that "Momentum is directly related to groundspeed, or more properly 'space speed' point-to-point in space," I knew that someone else would hear the voice long before me, and I could read about it in *Soaring*. Until my landing, there was no way I could think of to exchange energy with the earth, let alone space, except by falling up or falling down. My experiences could only be explained in terms of how I might be exchanging energy with an airmass that does different things in different adjacent places. Will some country boy please help me.

CHARLES (City Boy) WEBBER
Riverside, California

Mountain Soaring in Canada

Dear Sir:

U.S. enthusiasts had an opportunity to sample Canadian mountain soaring when members of the Seattle Glider Council and the Boeing Employees Soaring Club were invited to a two-weekend Labor Day soaring camp hosted by the Vancouver, Canada, Soaring Club. A large number of club and private ships were there for both weekends.

The Vancouver club flys from Hope, British Columbia, airfield which is about a three-hour drive from Seattle. The field is grass, 128 feet ASL, and has two runways 4700 feet long. It is situated in the Fraser River Valley which at this point is about a mile and a half wide. The site is surrounded by magnificent mountains as can be seen in the accompanying photo of an AS-W 15 near Mt. Hope.

The strip is edged on the south by a ridge which gives good ridge soaring in a west wind. This lift usually extends to 6000-ft. Mt. Hope on the east end of the site. To the north of the field lays Dog Mt. which frequently generates wave in the prevailing afternoon westerly winds.

Although the flying on Saturday was marred by a tragic accident, the ever hospitable Canadians did everything possible to make us welcome. Their clubhouse and grounds are first-rate. Pitching a tent on smooth level grass is a pleasure! On the first day of the camp several ladies of the club spent the better part of the day in the kitchen preparing salads and cakes for the welcoming barbecue.

Hope is without a doubt one of the loveliest soaring sites anywhere. Lofty mountains with patches of snow contrast with the dense green of the forests. The sparkling waters of the Fraser River and numerous lakes combine to make soaring at Hope a sensory delight. There are good campgrounds, wide smooth grass runways, stunning scenery, ridge lift, and some wave, all provided by a club composed of friendly people. What more could a visiting glider pilot ask for? We hope we are invited back next year.

NANCY ZIRKLE
Tacoma, Washington

Sharing Torrey Pines

Dear Sir:

We would like to thank Walt Mooney, Steve du Pont, and John Murphy for their letters concerning hang gliding at Torrey Pines, printed in the September issue of *Soaring*. After all the rumored bad feelings between the sailplane pilots, R/C modelers, and hang glider pilots, it was indeed a breath of fresh air to hear some rational opinions—and from established sailplane pilots to boot. We were overjoyed.

Since we first started flying Torrey Pines about a year ago, we have always felt that the only way to exist there is through both cooperation and education. The main thing a kite flier needs be aware of is the sailplane approach pattern, which, having seen it once, is very recognizable, both in the air and on the ground. Sailplanes don't occupy their approach window for long and it is very easy to avoid that area for the length of time it takes for one to land.

Whenever we are flying there and come across a flier new to Torrey Pines, we are always sure to make him aware of the safety measures needed. Hopefully, this winter will see a new spirit of interest, cooperation, and education among the many fliers who use the airspace. We're all interested in sailplaning; we hope to interest some sailplane pilots in our craft.

KEITH NICHOLS
BILL ROBERTS
TOM PRICE
KATHY MCKEEN
BILL LISCOMB
San Diego, California

Batten Down That Battery!

Dear Sir:

This summer, while soaring in my brand-new Std. *Cirrus* in our very poor summer weather, I encountered a cold front of tremendous power. After enjoying the front for almost two hours, I decided to land back at our field, but as I came down in a high-speed dive I found that we had extreme turbulence at about 2000 ft. AGL (10,000 ASL) so I slowed down to about 45 knots. Suddenly, I hit a downdraft which must have produced several negative *g's*, causing my landing gear to burst open and also, to my horror, putting my rudder out of action on the right side. Fortunately, I was able to turn left or maintain a straight-line course. Needless to say, I immediately made a heading for the field and landed safely.

Post-flight inspection showed that my

battery pack (which was supposed to be strapped in the nose) had flown out of its nylon straps and wedged itself between the fuselage and my right rudder pedal, making its inward movement impossible.

Later, going over what had happened, it was possible for me to wedge the battery in such a way that no movement was possible in either direction. It was also possible to wedge the battery and jam one rudder pedal to the degree of not being able to maintain a straight course.

I would suggest that anybody concerned check the strap-and-buckle system to see if it holds under stress and does not slip out of lock.

RICARDO SALINAS-PRICE
San Angelo, Mexico

Buoy Meets Gull

Dear Sir:

I recently had the pleasure of meeting Ed Hall's gull-friend (*Soaring* cover, Aug. '74). It looks as if she has left Maine's Pemaquid Bay for the warmer climes of Santa Monica Bay where I took this photo.

GEORGE UVEGES
Santa Monica, California

Like Flying a Lawn Chair

Dear Sir:

The *Monarch* ultralight flying wing has been completed. This has got to be one of the most fun sailplanes ever. Even after twenty-eight flights it still grows on me. It's like flying a lawn chair that drifts about the sky at 30 to 35 mph. I even have a sunshade over my head. It's weird to carry on a conversation with curious bystanders several hundred feet below without yelling. Its L/D? I'm not sure yet, but I can glide over 3000 feet from a tow to 120 feet. This has been repeated many times with similar results.

JIM MARSKE
Michigan City, Indiana

Xerograph Exposes Soaring Hat Caper

Dear Sir:

One day when I was fooling around with xerographs (i.e., exposing leaves, twigs, dirt clods, etc., to photographic film by the light of the sun), I was surprised by the appearance of the enclosed image which bears a striking resemblance to my great aunt from Cedar Rapids (a retired Naturopath whose favorite saying was, "It's better to *have* character than to *be* one.") This photo exemplifies all that is great about soaring—the bright smiling sun of the high plains, the brilliant blue early morning sky, the debonair appearance of the freshly-scrubbed pilot, and a hat that smells and looks like the interior of my cockpit after six or eight hours of bumbling about the skies.

A leak from a high-placed crew member of the charger from Ramah, Colorado, leads me to believe that there are actually *eight* "one-and-only lucky soaring hats" in John Brittingham's stable.

EDWIN D. RATHBUN, M.D., F.A.A.P.P., P.A.
Liberal, Kansas

In Defense of the RF-4D Motorglider

Dear Sir:

The 1974 Sailplane Directory is very well written and has included many seldom-seen and one-off models that have flown in times past. Bennett Rogers is to be congratulated for such a time-consuming effort.

There is one serious error in the motorglider section however. The RF-4D, with seventeen copies in the United States alone, is the most popular motorglider, not his AS-K 14, as he would have us believe by refusing to list the RF-4D. His reason was, "Owners do not use them as motorgliders but as airplanes." I called Bennett. He stated that this was because he had talked to an owner two years ago who had said he seldom turned off his motor. This particular owner, I might add, soars quite often when we fly together, but he has a larger engine with such high compression that the self starter has been removed.

The four RF-4D owners here in southern California with whom I fly soar on every flight we have together. Mike Bitner, for example, keeps his ship at Comp-

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ton Airport and has been soaring forty-five minutes almost every day during his lunch hour. He uses the small shearline-convergence two miles south of the airport over the refineries.

I have found and soared many conditions I never would have thought even existed if I had been in a glider or the usual short-ranged self launcher. I got to 14,200 feet over the mountain west of San Felipe in Baja California, Mexico, the last day of 1973 in a wave that was nowhere evident in the dead calm at the airport. Soaring with condors, flying along the Big Sur cliffs by Highway 1, exploring frontal systems, and many wave flights over the L.A. Basin are just a few of the many interesting soaring adventures with the Fournier. No question the sink rate is higher than the long-winged version, but with the speed and range of this little magic carpet, adequate lift is always found for soaring on every jaunt.

A sailplane is an expensive toy; a self-launched glider even more so. You can buy all the tows you could possibly use for the difference in cost between a Ka-6 and the AS-K 14. The oily little two cycle they use makes a very poor airplane for getting anywhere, so all you have is a fair glider that can launch itself, thus offering a great deal of convenience but not much else.

The Fournier RF-4D, however, can cruise at 113 mph on 2.85 gph of ordinary car gas for 400 miles, has superb handling beyond the meaning of the AS-K 14 owner's concept of the term, and can soar in all the truly interesting lift regimes except very weak and uninspiring lift.

I wonder why they quit making the AS-K 14 and are concentrating on the VW powered AS-K 16? No doubt, as Bennett guesses, many RF-4D owners use their ships as airplanes. Why not? They are superb touring machines with performance equal to a Cessna 150 in every way on only 32 hp. It will fly right alongside a 1-26 at 62 mph at 20:1, although at slow speeds in small thermals the 1-26 is easily the master.

To make a practical self-launching sailplane requires a good deal of power, and very little of this power is needed to make a fine cruising airplane—so clean is the design of most gliders. A sailplane/airplane is the most practical fun machine ever created. You can pick a place and go there, stopping to soar anywhere interesting along the way. You can loiter around with the prop barely flicking over at 60 mph, wheeling and turning at 50 feet over an interesting geologic formation or ghost town, using something like one gallon per hour. As much as I love competition in sailplanes, it isn't often you can slide close over the ground just looking at the world around us.

To conclude, the Fournier RF-4D is still the most popular motorglider in this country, and is the kind of machine engineers and designers should try for—a practical airplane that soars.

JACK LAMBIE

Bellflower, California

Spit & Whittle

Dear Sir:

It appears that in his account of the Hobbs Nats Ol' Red has done me an injustice. He named me the culprit who reseeded Big John's seat and sealed his canopy (*Soaring*, Oct. '74). Now I ask you, would the perpetrator of this foul deed be silly enough to sign his own name? Never!

However, in view of the present drought and the lousy condition of the cattle business, I know John can use all the grass he can find to get through to spring. I speak from a position of some authority here at Horseshoe Land & Livestock, Inc.

UGLY BEAR
(Springer Jones)

Mitchell, Nebraska

Wisconsin Soaring Youth Boosters

Dear Sir:

With last month's discussion about youth in *Soaring's* "Letters" column, I feel that I should bring attention to three people who have made outstanding contributions to youth in soaring here in Wisconsin.

First and foremost is Mr. Paul B. Hammersmith, the advisor of the Explorer Post of which I am a member, and the owner of a 1-26 which is very generously put at our disposal. In addition to following our soaring program, he conducts trips to various gliderports around the country. His generosity, tolerance, and friendliness are exceeded by very few.

Also deserving recognition is Mr. Gunter Voltz. He is very active concerning costs and youth in soaring. He is a major force in aiding us and keeping things in line, and he always has a little piece of soaring lore or technique to offer in his ubiquitous Volkswagen on the way to the airport.

Last, but by no means least, is Mr. Earl Stier, proprietor of the West Bend Flying Service. He is aware that people such as myself (a 15-year old working on my Silver Badge) are limited in finances and generously provides a discount on his rental sailplanes. He, too, is a ready source of wise advice and a wealth of aviation knowledge.

Although West Bend, Wisconsin, does not have the kind of soaring conditions that you can rave about to visiting pilots, these three men have helped create an atmosphere that permitted me my small achievements in this sport and which has produced carrier pilots, airline pilots, advanced badge pilots, Kolstad Award winners, and high ranks in the intercollegiate aviation circles.

This letter is meant to bring credit to these three very generous, knowledgeable, and honorable men who deserve it so greatly.

WINFIELD STARR

Milwaukee, Wisconsin

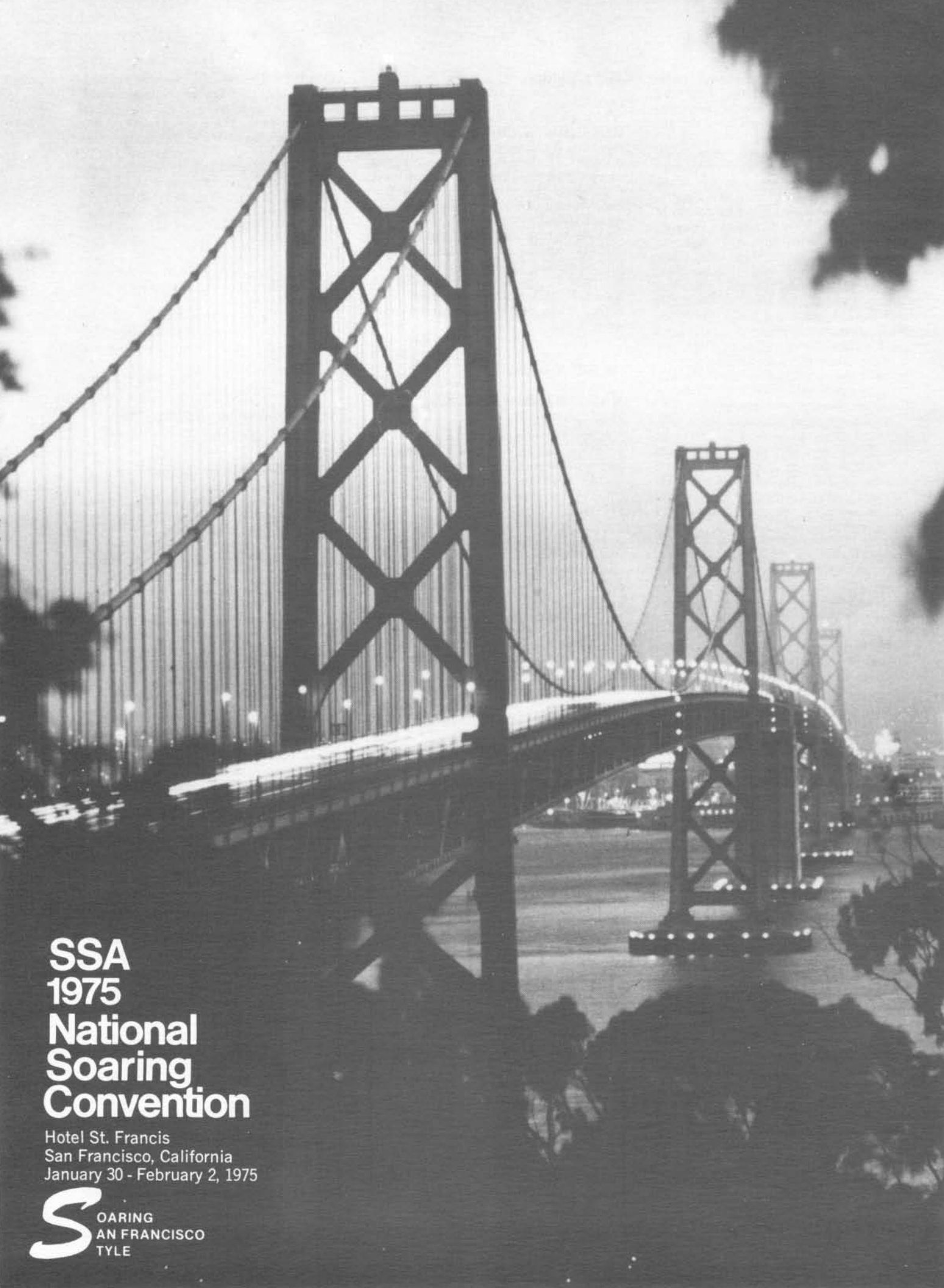
Needed: Something Between the Swingwing and the 2-22

Dear Sir:

Today my Gliding Instructor Rating expires. I have not been in a sailplane in two years. Soaring is an activity I have had to forego as the pace of life has increased and its quality declined. I recognize the truth of Moffat's statements on sailplanes as an investment (*Soaring*, Sept. '72), but this is hindsight and it would be more difficult for me to finance a sailplane today than it would have been as a struggling graduate student dreaming of the then newly-introduced wonder machine, the *Libelle*. I have had no truck with the "freaky" kite crowd, but they are accomplishing something for us and I hope they keep on trucking. We need something between the *Swingwing* and the 2-22. The new *Petrel* ("Letters," *Soaring*, Sept. '74) offers me more hope than I have had in a long time. I hope you will report in depth on this machine.

NYAL WILLIAMS

Muncie, Indiana



SSA 1975 National Soaring Convention

Hotel St. Francis
San Francisco, California
January 30 - February 2, 1975

SOARING SAN FRANCISCO STYLE

SSA in ACTION

"I LEFT MY HEART IN SAN FRANCISCO . . ."

Do the words fit your music? If you've been there, you know they do. If you've never been there, now's the time to go. And what better opportunity than a gathering of soaring people?

In ancient Greece, great comings together at banquets took place. Afterwards, there would be much music, singing, compotation, and conversation. It was a drinking together—a symposium—a social gathering at which there was a free interchange of ideas. That is what we invite you to in San Francisco—the 1975 National Soaring Convention. We call it

SOARING SAN FRANCISCO TYLE

The seventies are here; where are we? **Stan Hall** and **Taras Kiceniuk** know where they are and will comment about the sailplane's role in the next decade. **Jim George** and **Earl Smith** will discuss the Sierra and high-country soaring. This is an exciting area for both fun flying and competition. They are just some of the people who will be speaking during the sessions on February 1st and 2nd.

Lawrence Wood will begin his 1975 term as SSA President by presiding at the Directors' meeting. There will be time to make your own views known, too: The Annual General Membership meeting of the Society is an important occasion for members to participate. It will take place during the weekend, also.

Friday, January 31st, will be a busy time. The National Soaring museum Directors will be meeting all day under the guidance of their president, **Paul Schweizer.** We have been alerted to expect an important announcement from them at that time. **Fred Robinson** will head the SSA Business Members' meeting. The 1-26 Association expects to be meeting, too. The growing tradition to encourage early arrivals will be continued by the Convention host, Pacific Soaring Council (PASCO), with an Early Bird Party Friday evening.

Thursday afternoon, the Commercial Operators will be discussing the vicissitudes of their concerns under the able leadership of **Don Slotten.**

With Saturday night's cocktail party and Annual SSA Awards Banquet, it will be a pretty full schedule. To beautifully round it out, **Nancy Davis** has arranged an equally interesting time for those not attending the Saturday session. Take the tour of San Francisco and cross the Golden Gate Bridge for lunch in Marin County with visits to Sausalito, Tiburon, and a return across the Bay by ferry.

Besides the sailplanes, equipment, and supplies which will be on display, 1975 SSA Calendar manager **George Uveges** will present a large collection of the original artwork which was submitted for consideration by the judges.

We realize the world doesn't really revolve around San Francisco, but San Francisco is certainly centered on Union Square. And that is where the Convention will be—at the St. Francis Hotel. Some very special reductions on all room rates have been secured with prices starting at $22/single. There is a wide range of rooms with a limited number at the lower price levels so make your reservations early by writing to: **Hotel St. Francis, Union Square, San Francisco, CA 94119.** Be sure to state that you are attending the Soaring Society's 1975 National Soaring Convention in order to receive the special low rates.

Convention Registration fees are: Session only, $15/person; Banquet only, $15/person; Tour only, $15/person. A special package for $55 provides attendance for two at the Banquet, one at the Sessions, and one on the Tour. For advance registration, which will be held for your arrival, write to: **1975 National Soaring Convention, Box 3075, Fremont, California 94538.** See you there.

PASCO Convention Committee

NSM ARCHIVIST/EDUCATOR SOUGHT

The National Soaring Museum needs an Archivist/Education Specialist to help set up and oversee the functioning of the museum's archives and information retrieval systems and to work actively in its school programs. Qualifications: An interest in soaring and ability to communicate that interest to all age groups; an interest in helping to preserve the significant artifacts and documents from the past. Apply to the National Soaring Museum, Harris Hill R.D. #1, Elmira, N.Y. 14903.

Liam English NSM Director

STANDARD CLASS 100-KM RECORD CLAIM

Manfred Sczesny, 44-year old VW garage shop foreman from Sylmar, California, is claiming a national Standard Class soaring record for speed over a 100-kilometer triangular course of 75.8 mph for a flight he made in his Standard *Cirrus* from El Mirage Field, near Adelanto, California. He used the established turnpoints at Wrightwood and Littlerock, California.

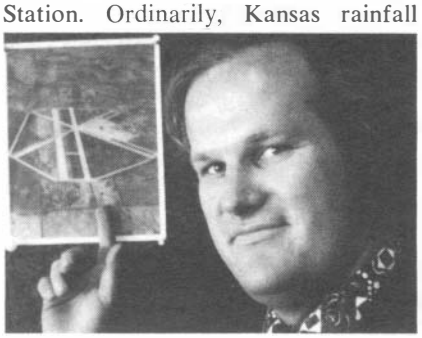
Sczesny made three attempts, but aborted the first two after the first leg. On his final attempt, the lift was not strong on the first leg, and the first turnpoint was in rain, but there was good lift under the rain cloud, and he climbed from 9000 feet to 12,500 feet in six-meters-per-second lift. From then on, he made a fast glide to the second turnpoint and home.

The previous record in this category was 68.56 mph, flown by Betsy Howell, at Odessa, Texas on August 14, 1973, also in a Standard *Cirrus*.

SUNFLOWER AERODROME

SSA'er **Bill Seed** is pointing to an aerial photo of what must be the world's largest gliderport. *His* gliderport. He calls it Sunflower Aerodrome. A neat name.

It has miles of concrete runways and taxistrips, hangars, a control tower, etc., and is located about 45 miles northwest of Wichita. It used to be called the Hutchinson Naval Air Station. Ordinarily, Kansas rainfall



can form large puddles in the great plains, but the recent drought dried everything up, perhaps prompting the U.S. Navy to move nearer to the water. At any rate, the sailors put it up for sale just when Bill was looking for someplace to fly his new *Blanik*. He was trailering his sailplane around when he spotted a couple of guys flying an old Slingsby *Swallow* on the 'drome just after the Navy moved out. It was from them he learned the place had just been put up for sale at an unbelievably low price.

Bill is a member of the Kansas Soaring Association and he knew they wouldn't meet for a month, and he also knew the Society had already spent years considering the advisability of a national soaring site. Time was of the essence, so Bill acted unilaterally and with dispatch, somehow raising the funds to swing the deal.

Word of the facility has gotten around and parachutists and car racing buffs have staged events at Sunflower Aerodrome, providing some revenue toward meeting expenses. But Bill insists his heart is in soaring and an article in the *Wichita Eagle* states that the airport "was bought as a gliderport to hold regional and national championship meets and as a place for local glider pilots to go soaring."

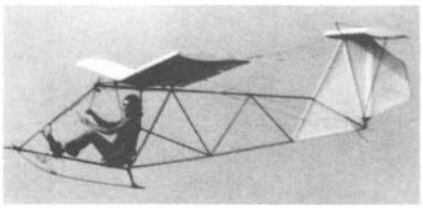
AUS DEUTSCHLAND

Must two-place sailplanes and motorgliders eschew the svelte lines of high performance in favor of dowdy plain-Jane utility? Germany's Schempp-Hirth factory doesn't think so, and two recent products, the *Janus* and *Nimbus M*, illustrate the point. S-H's designer, Klaus Holighaus, is enthusiastic about the *Janus*. "I really think it's the best glider I've made," he wrote to John Ryan, U.S. competition pilot and S-H dealer. "I am not sure I'll go back to flying the *Nimbus* again (because) it's so much more fun to fly a two seater."

After taking fifth in the Hahnweide International against an Open Class field that included AS-W 12's, *Kestrels*, *Nimbuses*, a 604, and a Caproni A3, Klaus flew the *Janus* around a 100-km. triangle at 142.9 kmph (88.7 mph) to claim the world two-place speed record.

In the current issue of *Motorgliding*, Walter Buhl, who attended the World Motorgliding Championships at Burg Feuerstein, reports the *Nimbus M's* one-day appearance attracted much notice when it soared around the course in 105 minutes compared to the 178 minutes it took the meet's winner (an SF-27M). The *Nimbus M* uses a retractable 55-hp two-cycle Hirth engine with an electric starter.

Ursula Hänle, designer of the 13-meter *Salto,* is intrigued by the rigid-wing ultralight configuration and has designed her own version for production by Start + Flug. Christened the *Hippie,* the new craft weighs in at 66 lbs. with a wingspan of eight meters (26.25 feet). In initial tests it was airborne at 45 kmph (28 mph). Conventional controls and a steel tube fuselage are used. But the wings employ fiberglass reinforced with carbon fiber.



THE TREASURER SEZ:

"Do you know that one of the best bargains in soaring today is a **Life Membership** in SSA? With inflation rampant, an increase in dues is certainly not years away (though not now under consideration by the Society's Directors). We have been fortunate to be able to invest **Life Membership** funds in securities that yield an adequate return to provide the services, including the subscription to *Soaring,* that all members expect.

"So, join the bandwagon of 475 other **Life Members.** You may pay a lump sum of $200 or make quarterly payments of $50. Remember, whenever the regular dues are increased by the action of the Board of Directors, **Life Membership** cost will also have to be increased."

T. E. SHARP
SSA Treasurer

1975 U.S. NATIONALS

The SSA Directors have given the nod to Hobbs, New Mexico, in its bid to host the 1975 U.S. National Soaring Championships. Competitive bids were also received from Chester, South Carolina, and El Mirage, California. The Directors were polled individually by mail, so the basis of the decision is not known, but it is probable that the phenomenal speeds achieved during this year's Standard Class Nationals at Hobbs may have favorably disposed them towards another go with New Mexico weather. The date has tentatively been set for June 17-26.

July 1 through 10 will be the date for the 1975 U.S. Standard Class Soaring Championships. The Pacific Soaring Council, sponsors of the meet, have chosen Douglas County Airport, near Minden, Nevada, as the contest site. The field is located in Carson Valley east of Lake Tahoe.

IN MEMORIAM

Soaring in New England has lost George W. Angell, one of its mainstays. A generous and kind man, respected by all, Bill Angell was instrumental in bringing soaring to several hundred people in five short years. He served as a charter member of the Massachusetts Institute of Technology Soaring Association and was its Membership Chairman, and MITSA Instructor, and later, the SSA Instructor for Yankee Soaring. He also was cofounder of Sailair Corporation (which was devoted to bringing soaring to young people), President of Region 1 Soaring Association, and was serving as SSA Massachusetts State Governor at the time of his death. We all loved Bill and his unbridled optimism for our sport and for life.

STEPHEN FRIED

The 967 Boom Mike Headset
Know the clarity of communications which only a headset can give, *without* that heavy, uncomfortable feel!

Lightest of lightweight headsets, the ELECTRO-VOICE 967 can be worn either with headband or clipped to glasses frames. Adjustable acoustic tube actually gives sharper transmissions than a bulky boom microphone unit . . . and without obstruction to visibility. Companion push-to-talk gives a reassuring click to let you know you're transmitting.

Get hands-off freedom without a heavy headset feel! The ELECTRO-VOICE 967.

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If you're also a pilot of powered aircraft, you've undoubtedly seen this mike. Over the years, the 205C has been a popular accessory on thousands of general aviation aircraft. And the main reason is quality.

Like every ELECTRO-VOICE product, the 205C is built for maximum durability. And time has proved it to be the ruggedest, best noise cancelling carbon mike on the market.

Powered aircraft or sailplane, the 205C is the best value going in a carbon mike.

EIGHTEEN month warranty. **FAA** approved.

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CALENDAR of events

Contests listed in bold-face type are sanctioned by SSA.

Oct. 28, Deadline for receipt of nominations for election of SSA Directors.

Nov. 1, Cumberland Soaring Group wave soaring season begins. Hangar space available. Write W. Holbrook, 408 Washington Street, Cumberland, Maryland 21502.

Nov. 23-24, Nov. 29-Dec. 1, Southeast Region 5 Soaring Championships (bid, subject to approval), Indiantown, Florida. Write S. Crane, Box 68 South Miami, Florida 33143.

Nov. 28-Dec. 1, Bishop Fly-In, Bishop, California. Write A. Schat, Rt. 2, Box 7A, Bishop, Calif. 93514 or T. Schirtzinger, El Mirage Field, Adelanto,Calif. 92301.

Dec. 9, Deadline for receipt of ballots for election of SSA Directors.

Dec. 17-Jan. 4, South African Gliding Championships, Oranjekrag Airfield. Dec. 17-24, Sports and Team Championships; Dec. 26-Jan. 4, Open and Standard Championships. Write Gliding Secretary, Aero Club of South Africa, P.O. Box 2312, Johannesburg 2000, South Africa.

Jan. 30-Feb. 2, National Soaring Convention, St. Francis Hotel, including SSA Board of Directors' Meeting, Feb. 1-2. Write your Director and the 1975 National Soaring Convention, Box 3075, Fremont, California 94538.

Feb. 14-16, 1975 Symposium on Competitive Soaring, Lakeview Country Club, Morgantown, West Virginia. Write Soaring Symposia, 408 Washington St., Cumberland, Md. 21502.

April 15-19, Region 5 Soaring Championships, Bermuda High Soaring Center, Chester, S. C. Dual contest (Open and Standard Classes, separate scoring). (Bid, subject to approval.) Write G. Seibels, 2400 Heyward St., Columbia, S.C. 29205.

July 1-10, 6th U.S. National Standard Class Soaring Championships, Minden, Nevada. Write D. E. Davis, 3576 Altamont Way, Redwood City, Cailf. 94062.

Calendar of Events

Sponsors of all soaring events are requested to submit details so they may be included in the SOARING calendar. Deadline for calendar items is the 20th of the month, two months previous to the cover date (March 20th for the May issue, for instance). Prospective participants and visitors should write to activity contacts for information on entry applications, rain dates, and practice days. Send calendar items to:

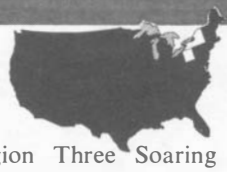
SOARING Magazine
Box 66071
Los Angeles, Calif. 90066

FREE ITEMS FROM SSA

The Soaring Society of America has a variety of items available on a free distribution basis, including the following (request by item number or name from SSA, Box 66071, Los Angeles, Calif. 90066):

3. FAI Soaring Awards Application Form.
4. SSA Membership Application Form.
6. "SOARING . . . The S.S.A. . . . and YOU" pamphlet. Tells about the activity, glider pilot certificates, how soaring is organized, SSA, and how to get started in soaring.
7. List of Soaring Clubs.
8. List of U.S. Sailplanes (new), plans, kits, ready-to-fly.
9. List of Soaring Schools.
10. List of Books on Soaring.
14. SSA Officers, Directors, Committees.
23. SSA Merchandise Order Form.
30. List of Soaring Films Available.
34. Annual and 100-hour Glider Inspection Report Form.
35. SSA's ABC Training Program (how A, B, and C badges are issued).
37. List of Foreign Sailplanes Available.
38. How to Start a Soaring Club.
39. State Soaring Records Rules and Application Form.
43. Poster to Promote Soaring, 11.5" x 15". Includes pad of tear-off forms for information kits. Has space for local information.
56. SSA Membership Benefits.
63. Contents of OSTIV Publications.
64. SSA Business Member Benefits.
65. Resale Prices for SSA Merchandise.
66. SSA's Traveling Photo Display. Describes the display, rules, and fees for its use.

BROCK YATES



REGION THREE CONTEST

The 1974 Region Three Soaring Championships were held at Dansville, New York, on June 17 through 21. It is a new site for the Region Three meet and it was put on by a rookie organization of the Rochester Soaring Club. Thanks to the excellent cooperation of the contestants, all went smoothly.

The Championship was decided in the minimum three contest days because of unsettled weather throughout the week. There was a total of twenty-one contestants present for the opening day. Five were Open Class and sixteen were Standard Class (including one 1-26C).

First contest day, June 17: The weather was dominated by a warm front. The prediction was for 200- to 400-fpm thermals with 3000- to 5000-ft. cloudbase. Overdevelopment was predicted with a 50 percent chance of scattered rain showers. Wind in the convection layer was called from 260° at nine knots. The task set was out-and-return speed with two turnpoint options, Penn Yan and return, 67.2 miles, or Exit 44 and return, 68.6 miles. As it turned out nine contestants went to Exit 44 and 11 went to Penn Yan. Joe Conn won the day in his AS-W 17 with 27.6 mph by way of Exit 44, while Frank Kruesi came second in his Standard *Cirrus* by way of Penn Yan with 24.2 mph. Several contestants changed their minds in midtask because of areas of overdevelopment although no rain was reported. There were six finishers overall, thus assuring a contest day. The weather turned out much as forecast except that the wind proved to be 15 to 20 knots, making it difficult to get home upwind.

Second contest day, June 18: A weak cold front passed the area during the night and a much stronger day was forecast with 400- to 500-fpm thermals to 6000 ft. at the peak of the day. Scattered overdevelopment was forecast with possible showers. The wind was to be 15 knots from 220°. A 151.5-mile speed triangle was set via Seneca Falls and Chemung Co. Airport. The day began stronger and earlier than forecast. No one moved up his takeoff time however, because even better conditions were expected later on. Some 800-fpm thermals were reported to 6000 ft. On the first leg, downwind, the early starters reached the turn (51 mi.) in about 40 minutes. The second leg, however, quickly overdeveloped and clamped the course. The overdevelopment spread back upwind to the first leg also catching the later starters before the first turn. There was good local soaring at Dansville all day but no one made the second turn. The day turned into a distance task with John Seymour, one of the early starters, winning with 66.6 miles. There were seven contestants over 60 miles giving an official contest day but a most disappointing one. Bud Briggs was best in the Standard Class with 65.6 miles. Joe Conn retained his overall lead with a 58.1-mile flight for a cumulative 1872 points. Stan Smith, however, was only 28 points behind, having exercised his trademark of a patient, low, low save halfway down the first leg.

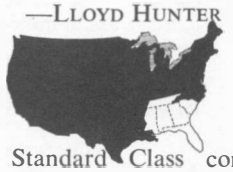
Third Contest Day, June 20: After a no-contest day of overcast and occasional light rain, another mild cold front passed during the night and a good day was forecast with thermals, mostly dry, to 6000 ft. at 400 fpm. A 15-knot wind from 290° was expected. The local sounding gave a weaker prediction than this, so a minimum crosswind task was set to Wellsville and return, 70.6 miles. The day yielded 11 finishers starring Jim Lippincott (in his 1-26C) who worked ridges, thermals, and will power for a 16-mph speed in a 15 to 20 kt. crosswind, a real *tour de force*. The winner was Vic Peres in his 604 with 50.4 mph. Joe Conn still maintained his lead to win the meet with a second-place speed of 42.4 mph. Bob Smith just nosed out Stan Smith for a second place overall. Stan took the third place Medallion. Bob Smith and Ron Desilets took first and second in the Standard Class. Ron, a newcomer to the East, is catching on to eastern soaring very fast. The best performance in a sailplane of American design and construction was won by Joe Perrucci in his *Concept 70*.

The Rochester Soaring Club team which organized the meet was Stu Lambers, Contest Manager; Jim Betts, Operations Manager; Lloyd Hunter, Competition Director; Adrianna Betts, scorer; and Ed Seymour assisted by Ray Cipriano on the weather briefing. Many other club members took part of their vacations to help. Special thanks must go to Ted Falk for running the start-finish gate and to Dick Olney for flying the weather charts in from Rochester every morning. We hope that every one had a good time.

The top ten

1.	**J. Conn**	**AS-W 17**	**2714**
2.	**R. Smith**	**Std. Libelle**	**2447**
3.	**S. Smith**	**Phoebus C**	**2431**
4.	**R. Desilets**	**Std. Libelle**	**2113**
5.	**J. Seymour**	**Diamant**	**2095**
6.	**W. Briggs**	**Std. Libelle**	**2065**
7.	**T. Smith**	**Phoebus C**	**1926**
8.	**R. McLaughlin**	**AS-W 15**	**1761**
9.	**J. Perrucci**	**Concept 70**	**1742**
10.	**R. McMaster**	**Std. Cirrus**	**1667**

—LLOYD HUNTER



SOUTH REGION FIVE CONTEST

Twenty-two Standard Class contestants (and three guests flying Open Class ships) gathered at Cordele, Georgia, August 21-25 for the Fourth Annual South Region 5 meet found typical middle Georgia August weather awaiting them—as warm as the local residents' welcome, and a lot more humid. Competition Director E. T. "Woody" Woodward proposed using the Designated Start system for the meet. A vote of the pilots taken at the pilots briefing endorsed this suggestion, and with the launch line (run by Operations Director Ed Sessions) putting the contestants into the air in twenty-two to twenty-eight minutes, the system worked well throughout the contest.

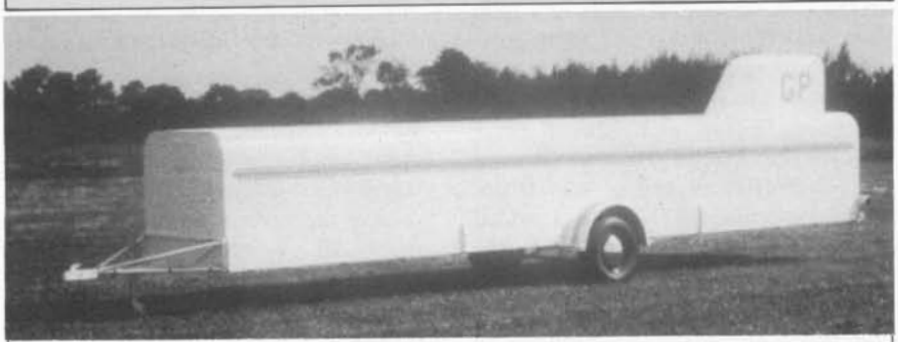
August 21: Speed triangle; Cordele/Perry/Cochran and return; 104.5 miles. The first day this year was a carbon copy of last year's; a thunderstorm moved over the field from the south at midafternoon, complete with heavy rain and scattered hail. Unlike last year, though, seven contestants and all three guests managed to finish, the last four after the rain had begun. Four more were on final glide when shut off; Ray Gray, a quarter of a mile behind the last finisher, found it impossible to land at the field and overflew eight miles to the southwest where he landed in a big field and sat out the storm in his ship. Most of the finishers were also caught in their ships and sat through the heavy rain frantically requesting extensions of the start-time interval for turning in their landing cards and photos. The top three were: Bobby Bridges, 36.50 mph; John Byrd, 36.32 mph; and Hal Myers, 35.85 mph. The meet's only unfortunate incident occurred on the first day when Pete Espenlaub hit a fence on an off-field landing, breaking his Standard *Cirrus* and winding up in the hospital with cracked vertebrae and cuts from the wire. Fortunately neither Pete's nor Papa Echo's injuries were unduly serious and they will both be back in the air soon.

August 22: Speed on out & return course to Butler; 97 miles. With the ground generally wet and late development and weak conditions forecast, Woody called a short speed task to the northwest where the ground was probably drier. The day proved to be stronger than forecast, and eighteen pilots finished the task with five topping 40 mph. Hal Myers' 44.02 mph won the day and moved him into first place, a spot he held for the rest of the contest. Andy McQuigg was second in the PIK-20 at 43.60 mph, and John Byrd was third with 42.37 mph, moving John into second place overall.

August 23: Speed triangle; Cordele/Fitzgerald/Tifton and return; 101.7 miles. The Macon Weather Bureau predicted drier air and somewhat improved conditions. This day provided the meet's highest winning speeds. John Byrd blasted around at 50.30 mph to close to within five points of first place, but Hal Myers grimly hung on by finishing second at 49.33 mph. Joe Shepherd moved into contention with 48.67 mph and third for the day. Again eighteen contestants and the three guests finished.

August 24: Speed triangle; Cordele/Dawson/Perry and return; 142.9 miles. A difficult second leg under a high overcast marred an otherwise excellent day and dropped two of the front runners out on course, shaking up the top standings. Hal Myers, winning the day with 45.05 mph, moved well ahead of the pack; Dave Culpepper, second with 43.12 mph, and Joe Shepherd, third with 42.12 mph, moved into third and fourth place overall with Bobby Bridges, who had some tough luck at the start and 33.72 mph for the day, hanging on to second place.

August 25: Speed triangle; Cordele/Butler/Perry and return; 113.1 miles. After unpromising morning fog, the day broke suddenly and strongly, producing the overall best speeds of the meet. All twenty-one contestants finished the task, ten at better than 40 mph. Andy McQuigg and John Byrd regained face by finishing at 48.58 and 47.14 mph, first and third re-



spectively for the day. Ray Gray, who went through the gate 25 minutes after the next to last starter, blasted around at 47.56 mph to take second for the day's task. Joe Shepherd took fourth, moving into third overall with 46.57 mph, and Bobby Bridges, fifth for the day at 45.10 mph, hung on to second place for the meet. Hal Myers, flying a conservative 43.14 mph for seventh place on the day, thus became the undisputed champion with his 274-point first place lead.

So ended another successful Cordele meet. During the four years this contest has been held here early-in-the-day-soarability and judicious task-setting have produced 24 official out of 25 possible contest days and always an enjoyable meet. Y'all join us sometime—the flyin's good an' it's the beginin' of the scuppernong grape and boiled peanut seasons.

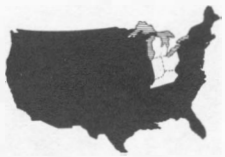
The top ten:

1.	**H. Myers**	**Cirrus**	**4851**
2.	**B. Bridges**	**Libelle**	**4577**
3.	**J. Shepherd**	**Libelle**	**4444**
4.	**J. Byrd**	**Cirrus**	**4207**
5.	**J. Giltner**	**301-Libelle**	**3976**
6.	**A. McQuigg**	**PIK-20**	**3964**
7.	**R. Gray**	**Cirrus**	**3935**
8.	**E. Williston**	**Libelle**	**3818**
9.	**D. Culpepper**	**AS-W 15**	**3617**
10.	**J. Perkins**	**Libelle**	**3541**

The guests—scored against the competitors

F. Compton	**Open Cirrus**	**4570**
P. Carnes	**AS-W 17**	**4377**
B. Clarke	**Open Cirrus**	**3708**

SAM CRANE



REGION SIX CONTEST

In mid-June Joe Conn trailered his AS-W 17 from his home in Ohio to Dansville, New York, where he proceeded to win the Region 3 Championships. A few weeks later he was at Adrian, Michigan, where he placed 14th in the U.S. National Championships. By this time he was getting his second wind and so he pulled "Uncle Joe" (alias "Uniform Juliet") out west to Kansas to take third in the Region 10 Championships. To round out the season, he returned to Michigan for the Region 6 Championships at Ionia. He found 26 other pilots assembled to

do battle in an assortment of sailplanes that included six other Open Class craft besides Joe's AS-W 17.

Practice makes perfect. Joe Conn won again.

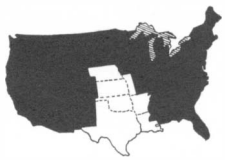
It was close, though. Vic Peres took the first two days in his 604 and racked up the fastest speed of the meet on a 64-mile O&R task the second day—66.73 mph. But Joe bounced back to take first on the last two tasks, including a 128-mile O&R race, the longest of the competition.

Joe Conn

Bob Tresslar took fourth in his Laister *Nugget* to win the award for the highest-placing American-built sailplane.

The top ten:

1.	**J. Conn**	**AS-W 17**	**3869**
2.	**V. Peres**	**604**	**3847**
3.	**J. Emons**	**Nugget**	**3410**
4.	**R. Tresslar**	**Libelle 220**	**3345**
5.	**J. Van Dyke**	**Nimbus II**	**3281**
6.	**R. Schreder**	**Std. Libelle**	**2975**
7.	**G. Hammond**	**Std. Libelle**	**2933**
8.	**W. Beck**	**Std. Libelle**	**2932**
9.	**D. Eisenbeiss**	**Std. Cirrus**	**2924**
10.	**F. Huenl**	**Std. Cirrus**	**2827**



REGION TEN CONTEST

SSA President Marion Griffith shucked off his duties guiding the Society long enough to compete in the Region 10 Championships at the new Sunflower Gliderport and Aerodrome in Hutchinson, Kansas, July 28-August 2. He guided his *Nimbus II* effectively enough to win the meet.

Twenty-five contest pilots used the huge facility (a former naval installation) as the start-and-finish gate for four triangle races whose distances ranged from 133 to 168.5 miles. A

mixed bag of five Open Class sailplanes (*Nimbus II*, AS-W 12, AS-W 17, H-301 *Libelle*, and a *Diamant* 16.5) and twenty Standard Class entries (five each of Standard *Cirrus* and AS-W 15, four Ka-6's, two *Libelles*, and one each of the Laister *Nugget*, LS-1, SH-1, and HP-14) constituted the field.

R. MIDDLETON

Marion Griffith

After 21 days of unbroken midwest drought, the first day had to be canceled because of rain and high clouds, but the remaining four days provided Contest Manager/Director Sherrill Bredfeldt with weak to moderate convection. It was good enough on the second race to enable Marion Griffith and John Luttrell to whip around a 152-mile task at 81.37 mph and tie for the meet's fastest speed. In the end, Griffith's daily standings (3-1-4-3) won him 3773 points, 100 more than Luttrell and enough to win the title of Region 10 Champion.

An HP-14 flown by Robert Jackson placed 13th to win the award for the highest-placing American sailplane.

The top ten:

1.	**M. Griffith**	**Nimbus II**	**3773**
2.	**J. Luttrell**	**AS-W 12**	**3673**
3.	**J. Conn**	**AS-W 17**	**3650**
4.	**S. Starr**	**Std. Cirrus**	**3402**
5.	**J. Emons**	**Libelle 220**	**3370**
6.	**J. Burke**	**Std. Cirrus**	**3238**
7.	**J. Shepherd**	**Std. Libelle**	**3233**
8.	**J. Harrison**	**LS-1**	**3104**
9.	**G. Gilmer**	**AS-W 15**	**3032**
10.	**R. Eli**	**Diamant 16.5**	**2998**

Carl Herold reviews a new book by the world soarin

Besides being a writer and publisher, Jon Joss is a soaring pilot and is a great admirer of World Soaring Champion, George Moffat. Joss' publishing company, Soaring Press, will shortly be issuing a new book by Moffat titled, WINNING ON THE WIND. *It is informative, substantial, sells for $5.00, and will be released initially as a paperback. Joss the publisher has deferred to Joss the Moffat-watcher who is generously permitting* SOARING *to reprint excerpts from the book because, ". . . he shows a side of himself that few of us suspected and the book will delight those who regard him exclusively as a competition pilot without soul . . . His comments on many of the world's greatest soaring pilots are fascinating. . . . These words of George's deserve wide attention . . ."*

WINNING ON THE WIND *is a collection of George's original writing on glider comparisons, record attempts, contest exploits, as well as accounts of how he won the big ones. In addition, his Soaring Symposia material on low-loss flying technique is included. He has also written new material which I think is quite revealing of the man, and which adds new dimensions to George he hasn't shown us previously.*

He gives his personal observations on 39 sailplanes and his overriding theme is winning: picking the ship to win, the flying technique to win, and preparing yourself, ship, and crew to win. Read this book carefully and you will find it has a message loud and clear for all soaring pilots. If you want to excel in this sport, George has identified the ingredients; it is up to you to put it all together.

George now feels that along with a winning technique, sailplane, crew, and equipment, you must be prepared psychologically with a winning attitude by building your self-confidence and undermining the mental state of your competitors. This is something new for George. But I agree with Philip Wills' introduction which includes an assessment of George's psychological methods: George is gearing himself up, improving his concentration, enhancing his self-confidence and poise. I suspect that George's psychological warfare on others is just beneficial fallout. In past years of serious athletic competition, I found that seldom did the best competitor have the time to do more than concentrate on the job at hand. Diversion of attention to others was a sign—possibly of a good competitor but not the likely winner.

George's writing is lively, positive, and direct. You might not agree with him, but it is hard to disagree. Some of his observations are as applicable to life as to soaring: ". . . If 'bad luck' always seems to haunt you under certain circumstances, it's very likely to be bad judgment. . . . Sometimes it helps to ask friends what they think are your strong and weak points, but politeness frequently prevents criticism that is sharp enough to be of any use . . . If you aren't flying cross-country, you aren't practicing. There is almost no point at all to piling up hours within five miles of the airport. Actually, I think that such flying is actually detrimental . . . Win by avoiding a whole lot of little mistakes . . . Practice is obviously the key to improvement whether a pilot has two hours or two thousand hours, but over the years I have seen a great many pilots who confuse practicing with just plain flying . . . The trick is to pull a 'Dick Johnson.' Dick has never won a speed day as long as I have been flying against him. On the other hand he never loses (a day) by all that much."

You may not agree with his logic or his opinions, but it is hard to argue with a pilot who has won 23 out of 54 speed tasks in major contests over the past eight years or won 45% and 33% of all Cats-Cradle and Free-Distance tasks respectively.

George's descriptions on sailplanes focus on winning rather than such factors as ease of assembly, repairability, crash protection, ground handling, short-field high-energy landings, etc. His book does not recount past failures, frustrations, and broken gliders. In this regard George still is playing the game; his competitors are permitted to see only the complete winner.

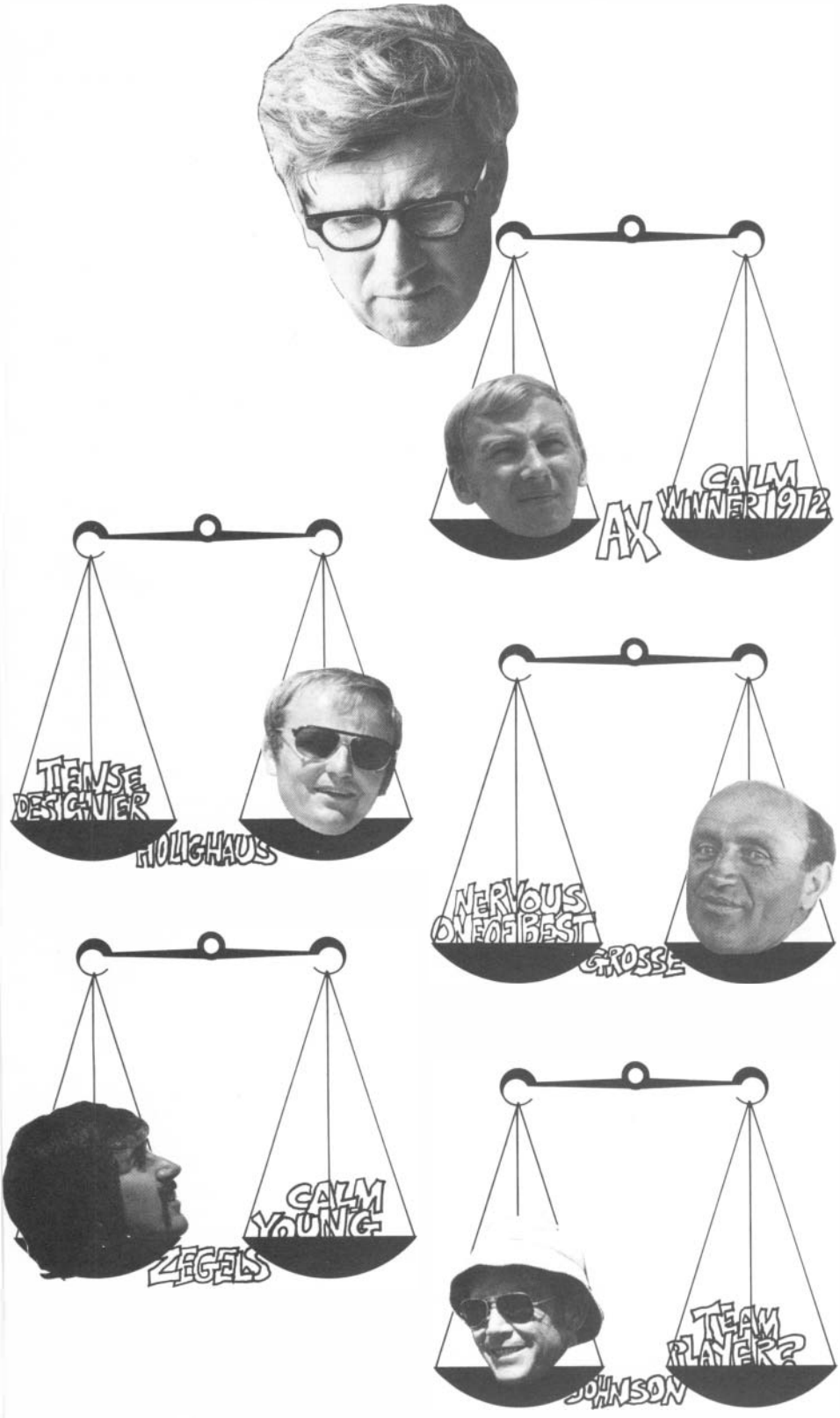
To the soaring pilot who craves more to read (and reread) so that he can identify what to concentrate upon to improve his performance, there is no better single book on the market today. George has written a book which should be on the desk of every pilot who aspires to soaring competence, no matter what his level of soaring achievement. There can only be one winner. This is his book.

CARL HEROLD

ampion. Here is a chapter from –

Winning on the Wind

by GEORGE MOFFAT



By 1971-1972 I felt I had reached a limit to some seven or eight years' worth of the tactical approach to contest flying. I found it increasingly hard, after having won the Nationals in 1969 and 1970 and the World Championships in 1970, to crank up serious interest in this aspect of competition soaring. It was something I felt I could do well, but something that several of the world's ranking pilots had pushed to the limits of possibility. The whole process was becoming dull — or at any rate dulled. The intellectual challenge was gone. In both years I did badly . . . and wondered if I had not lost the will to win. I found myself thinking fairly often . . . who cares?

A New Approach

The summer of 1973 saw the beginnings of a new approach to contest flying on my part. It was not arrived at consciously — not even present in my mind during the Standard Class Nationals in June—but something new was stirring, signaled by a revitalized interest in competitive soaring. The technology—the winning-by-not-losing idea—seemed to diminish in importance. It had become a factor I could rely on without having to think about it. The new idea, first realized consciously at Liberal, was based on a simple thesis: in the 1970's, thanks to interchange of information, similarly high-performanced ships, and extensive competition, there were, among the top ten pilots in the world and perhaps three or four in the United States, no real advantages in skill, equipment, or knowledge. This meant that only two or three factors could decide a winner—luck, psychology, or use of a pilot's personal energy. Luck could be dismissed as a constant, varying with weather from day to day but tending to self-cancel in longer meets. Psychology, then, or perhaps a psychologically-oriented use of energy, seemed to have dominant potential. Could it become a basic and controllable factor that could give one an edge? I believed it could. This realized, psychological rather than tactical planning seemed the potential key to success. A whole new interest and enthusiasm sprang into life, and soaring seemed immediately more

human, less a matter of the sum being only the simple addition of the technological parts.

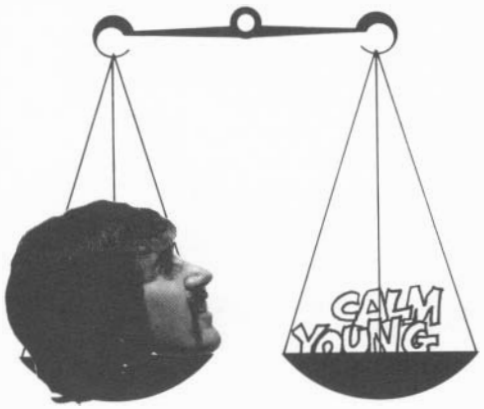
The psychological interest was an old one for me, left over from my days of international-level sailing before I took up soaring. One of the factors I had most enjoyed in sailing, and missed in soaring, was the interplay between individual personalities possible with boats only a few yards apart. But this factor seemed difficult to apply to flying. With a long contest in prospect at Liberal, with up to ten flying days likely, and with long tasks and good conditions tending to diminish the luck factor, and then with most of the top competitors flying ships of near identical performance, I estimated that psychology and a planned use of personal energy resources were likely to be the winning factors.

The Primary Factors

Given the stated conditions as those likely to govern the contest, what conclusions could be drawn? First, intelligent use of personal energy seemed the primary factor. No one can fly flat out for more than six days, especially if the tasks are long and the weather hot. Everyone has known for years that winning soaring contests is a matter of concentration. The trick is realizing that concentration—a form of energy—must be rationed so that it will work most effectively over the whole contest. Second, it seemed of great importance to assess the qualities of the five or so pilots who were likely to have the equipment, experience, and ability to win. Fortunately I had flown frequently against all but Ray Gimmey, so there was information to work with. Of the five that I considered the strongest threats—Smith, Scott, Johnson, Greene, and Gimmey —all had superlative and well-proven skills.

But all had weaknesses. A.J., certainly one of the finest American pilots ever, had, as usual, overextended himself on last-minute modifications to his ship and looked exhausted before the contest had even begun. Moreover, he had not been very successful in recent years, save in 1971 when he was flying an AS-W 12 against competitors in far lower performance ships. Scott, an old friend and brilliant pilot, had not flown competitively since 1970. Unlike most competition pilots, Wally has seldom ventured out of the Odessa-Marfa area, and I was hoping, candidly, that strange territory would prove more of a handicap to him than it would to pilots who have flown in dozens of different locales.

Dick Johnson, perhaps the best weak and variable weather pilot of us all, has seldom excelled at the speed tasks that I knew would predominate at Liberal. Furthermore, Dick hadn't won a Nationals since 1964. Ben Greene, a top pilot, had never won against the other U.S. Team pilots and seemed to have a psychological block, either flying steadily and consistently but seldom finishing better than third or fourth, or flying brilliantly for several days and then 'blowing it' from sheer nervous tension. My own disabilities I appraised as a tendency to push too hard to make points in uncertain weather and an inclination to expend too much energy in the first two-thirds of the contest.



Success at Liberal

With all these thoughts in mind, I decided that a moderately strong start, with the hope of being in top place by the sixth or seventh day, would be the right plan to follow at Liberal. Winning a day or two in the first five is a good idea whenever possible, because of the psychological pressure it puts on competitors. Personally I find it much easier not to be in first place for the first few days as the pressure of being everyone's target is very great. There is also a dangerous tendency to start feeling a little sorry for oneself around the fifth or sixth day—a sort of "how long do I have to keep this up?" feeling.

As luck had it, the first day at Liberal was a relative 'wipe out' when a big thunderstorm downed all but three pilots near the second turn. Of the real threats, Scott fared best with 661 points, I was comfortable with 625, and A.J. low with 539. The second day was a 200-mile triangle in rather good weather. I flew fairly hard to finish second and moved up to fourth overall. A.J. had another bad day, and I had a comfortable speed margin on Johnson, Scott, and Greene. Ray Gimmey lived up to his reputation with a strong third. The third day sounded good in the forecast but looked tricky. I decided to be conservative and start early—and was rewarded by winning the day when a thunderstorm cut off the route home to later starters. Smith, Scott, and Gimmey all got caught out, and I moved up to second behind one of the three ships that had finished on the first day.

On day four by placing third, I moved into a comfortable 200-point cumulative lead and extended that to 300 points on day five. Day six was a disaster for me, with nothing going right on a multiple-choice turnpoint option (not my favorite task!). Dick won with an excellent flight and showed that he was a factor to be reckoned with now that he had a ship suitable for speed tasks. I still had more than 200 points of lead and

recognized that I could afford to relax a bit on the three remaining days. A second on the seventh day advanced my lead back to three hundred points, and I realized that I was in the ideal position. Dick and Ben, my two closest competitors, would really have to turn it on to catch me—after seven days of long and hard flying. A.J. was 400 points down as a result of the first three days when his flying had been poor, possibly due to lack of practice in, or familiarity with, his newly and very effectively-modified ship. Wally and Ray Gimmey were doing well and flying consistently but were losing points.

A fifth and a tenth on the final two days, flying as conservatively as possible while still keeping the pressure on, insured an easy victory with some 160 points over Dick.

I had won the 1973 U.S. National Soaring Championship.

Preparations for Waikerie

For reasons never made clear, the SSA procrastinated over naming the U.S. Team members until late August, 1973, giving us little time either to send out our own ships or arrange for other ships to fly in Australia the following January. Early estimates indicated that shipping out my Standard *Cirrus* would be prohibitively expensive, and no very good Standard ships seemed available for rent. Calls to Rudy Mozer of Schleicher and Klaus Holighaus of Schempp-Hirth resulted in a possible offer of an AS-W 17 or a definite offer of a new *Nimbus II* delivered in Australia for very moderate rent. Needless to say, the bird in the bush—Australian Bush, that is—was the one to take, so I ended up flying in the Open Class rather than the Standard as I had originally planned.

Since my total experience in a *Nimbus II* at that time was around five hours, I cast about for some way to get some practice. Very generously, Kari Berg offered me the use of her late husband's *Nimbus II* both for practice and for the contest if shipping turned out to be feasible. This would be an enormous advantage as the whole fall could be used for working out 'go-fasts' and clean-up items for the ship, and I would have a *Nimbus II* fully equipped and instrumented for the contest.

Unfortunately, the best laid plans followed their usual course. First, the Air Force decided that it could not assist in shipping. Next, the airlines (which had originally quoted a very attractive estimate for air freight on initial inquiry) came up with a final quote of $9000 round trip. Since such a cost was obviously prohibitive, we decided on the next best course. During the fall I flew the *Nimbus II* for some thirty hours while simultaneously working out various 'go-fasts' that we could take with us, along with a ready-to-go instrument panel made up of a combination of the best of my instruments and those of Quentin Berg.

At the same time I started an extensive correspondence with Klaus about weak points in the ship and possible solutions to them. I agreed with A.J.'s estimate that the *Nimbus II* suffered severe wing-root airflow separation at lower speeds and so started an extensive tuft study with the help of Dr. 'Put' Putnam of the Forrestal Aeronautical Laboratory in Princeton. Early flight tests showed separation beginning at over 10 mph above level-flight stall speed, as compared with the same condition at three miles over stall speed in the Standard *Cirrus* with its well-faired root junction. The next month and a half were spent in creating fiberglass root fairings that would allow full flap movement. It was a formidable job, but tests showed very favorable effects on flow and stall speed. Final models were produced with the help of Arthur Zimmermann in his shop. The whole project took well over 150 hours to produce the two fairings. However, not only did the fairings improve the ship's low-speed performance somewhat, but we also counted on their having a devastating psychological effect on the other *Nimbus II* pilots in Australia!

Meanwhile, other projects were on the fire. Early test flying with full ballast against Art Hurst as a guinea pig showed that the *Nimbus II* lost very little in climb at full gross weight. We knew that several of the ships going to Australia would have special, extra-large factory tanks, allowing an additional 150 lbs. of ballast, to bring wing loading to 9.3 as opposed to the normal 8.5 lbs. maximum. A plan was evolved to stretch the standard *Nimbus II* tanks, checked with Klaus for feasibility, and tooling made to accomplish the change at the contest site in Australia.

Experiments against Art Hurst in his beautifully-flown Standard *Cirrus* indicated that better climb could be achieved. We began experimenting with flap settings and finally found ones that produced marked performance improvements at critical air speeds over the factory-recommended settings. About the same time Klaus very generously sent corroborative reports from Zacher's flight tests of the *Nimbus II*, showing that the factory-recommended flap settings were indeed completely wrong. We set about cutting additional flap notches to get the right settings. At the same time we made a complete set of seals for all control rods and surfaces, testing the fit on Quentin Berg's ship, and packed them, ready to ship to Australia. Extensive manometer tests were made to discover the best location for an exit vent to get rid of cockpit ventilation air.

In short, while we planned a primary advantage on the psychological side, we left nothing to chance in technological matters. Having a perfectly prepared ship not only devastates less nit-picking competitors, it also psyches up the pilot and gives him confidence that nothing that could make a difference has been overlooked.

The Practice Period

Arriving in Australia on December 29, we immediately headed for Waikerie where our ship, owned by many-time Australian Champion Malcolm Jinks, was based. An attempt to fly to Renmark (our training site until competitors were officially allowed at Waikerie) was foiled by rain. After about an hour of local flying, trying unsuccessfully to break out, I landed back, to disassemble in a downpour and drive the fifty miles. The result of the long drive in wet clothes was a cold that rapidly turned into a persistent form of bronchitis that was to trouble me through the meet despite copious dosages of penicillin.

During practice at Renmark, we gradually applied our various 'go-fasts' to the ship, stirring up lively curiosity among the other pilots there. We purposely saved the root fairings and increased ballast capacity until two days before the contest to thus deliver maximum psychological effect without giving others the chance to copy them. Weather was mundane, to say the least—no bases over 6000 feet and few thermals above 500 fpm in cloudless skies. For this we had come 12,000 miles?

Gradually, as I got sicker, the ship got more and more ready, thanks to much work on the part of Ralph Boehm, my crew for ten years, and newcomer Doug Gaines who owned the AS-W 17 I had flown at Liberal. The whole period sticks in my recollection as a hazy remembrance of pills, radio problems, and occasional flights in not very remarkable weather.

Analyzing the Competition

As the contest itself grew closer, I began to think more and more about basic strategy. I had already made a list a month earlier of likely winners and tried to assess their strengths and weaknesses versus my own plans. From past experience, I thought the winner might well be Goran Ax (Sweden, winner in 1972), Burt Zegels, (Belgium, young and improving rapidly), Hans-Werner Grosse (Germany, one of the very best), Klaus Holighaus (Germany, with attitudes very like my own) or Dick Johnson. As a result of the practice period, I soon added to my list the relatively unknown Frenchman Francois Ragot, a brilliant and daring pilot in a very good AS-W 17. Matias Wiitanen of Finland, runner-up in 1972, seemed out of contention due to flying a 19-meter ship against the big '17's and *Nimbuses*. The Poles were potent but their *Jantars* had only 19-meter spans.

Of the list of likely winners, Ax and Zegels seemed to me the most dangerous, because both are very calm pilots with excellent records. I thought Zegels' youth might be a factor against him as would the fact that his teammate seemed far inferior to him in ability, making effective team flying difficult. The same was true of Ax. Hans-Werner Grosse is as fine a pilot as I have ever known, but very nervous. I felt a long contest would be very hard on his nerves, as it obviously had been in Marfa in 1970. Furthermore he is notorious for his inability to cooperate with teammates, and I thought that intra-team tension would detract both from his performance and Klaus'.

Klaus, despite being a very good friend, was largely an unknown in terms of competition. However, I knew that the strain of running a large and successful glider factory and the great financial importance of having his design win were burdens that I was most happy not to have to share. My teammate Dick Johnson had competed in International Championships since 1952 without finishing better than third. I could see no reason to expect the pattern to change, despite his unprecedented record of seven wins in the U.S. National Soaring Championships. The most important single factor in winning is believing that one is going to win. I just didn't sense that belief in Dick.

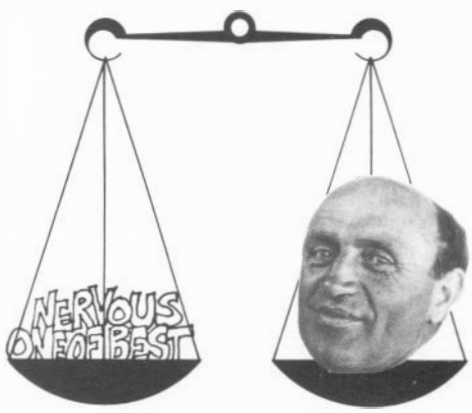
Building Team Spirit

An unknown factor for the United States team was the degree to which team flying would be used. Only once in my memory had it worked at all—between Wally Scott and me in 1970—and then it had been extremely beneficial. In other contests, personality conflicts and lack of trust between pilots had prevented more than spasmodic attempts. The essence of team flying, as Wally and I had worked it out, is fairly constant exchange of thermal strengths, cloudbase heights, and other useful information over the radio, Ideally, it gives each pilot four sets of sensors with the weather in an area rather than one.

The catch lies in the fact that each of the four pilots has come to win and is apt to think twice about giving away valuable information about good areas, holes, etc. Furthermore, whichever pilot is in the lead geographically at a given moment tends to give more than he receives, so that pilots have to be willing to take turns flying 'point.' Naturally if one pilot feels he is giving a good deal more than he is getting, he begins to keep things to himself and very soon the whole effort breaks down.

Since all four of our team pilots are highly individualistic, I wasn't sure how well the idea would work. I discussed the idea a good deal with Dick, Tommy Beltz, and Ben Greene before the contest, and we did some trial work during the practice period (except for Dick, whose ship had not yet arrived). During the first four days of the contest proper, I leaned over backwards to be as helpful with information as possible with the others, especially Dick, and took the lead on most days. My hope was to build up enough confidence in the team, as a team, so that the information would still flow when things got tight at the end. I hoped that by being willing to fly lead for Dick frequently in the early days I would build up a sense of trust.

Whether or not it was the result of this psychology, the strategy worked superbly. On at least one occasion a timely message from Ben gave me a first place for the day. On another



day, during a dicey final glide, I was able to find Dick a last thermal that got him home. He in turn was immensely helpful on the 440-mile day when we ran into the weak weather to the east. Needless to say, during the contest I gave great credit to our team flying for my good showings, knowing the psychological effect it would have on Ax, Zegels, Grosse, and Holighaus, none of whom was having much luck getting help from teammates.

Three days before the contest, we pulled the ship into the repair shop and spent a day modifying the ballast tanks. Needless to say all other *Nimbus* owners and AS-W 17 drivers watched with interest as Freddy Jiran, our maintenance chief, made the modifications with equipment brought from the States. In the anticipated strong conditions the ¾-lb. wing loading advantage over ordinary *Nimbus II's* and well over a pound more than the '17's would help greatly.

We hardly had the ship back together before one of the other teams complained to the Australian FAA that the ship would be over legal gross weight—as would almost all other ships in the contest if tanks were filled. Furor mounted for several days as I demonstrated that the ship climbed beautifully with the added weight and ran much better.

We also broke out our root fillets at about this time and immediately became the most photographed *Nimbus II* on the field. The effect was immediately apparent, as many of the other *Nimbuses* quickly grew crude imitations. The problem of having a fillet and being able to actuate the flaps proved insurmountable to the others on short notice, however. It was very satisfactory to be able to outclimb the AS-W 17's of Dick and Grosse fairly easily, despite Grosse's much-touted long-wing modification. We seemed to have an edge on most of the *Nimbus II's* as well. Only Ragot's AS-W 17—an especially good one despite being straight out of the crate—seemed to go as well as mine. In short, the pre-contest strategy had been a success.

By this time I had my plan for how to fly the contest as a whole fairly clearly in mind. The factors influencing my thinking were the likelihood of very long tasks (the owner of my ship was a member of the Task Committee and a handy source of local knowledge), a likely contest length of 12 days out of a possible 14, and plenty of hot weather. Terrain was much like west Texas, so homelike to Americans while rather desolate and forbidding to Europeans. In short, the proper use of personal energy seemed the fundamental factor in winning. My plan was based on starting at a moderate pace, trying to do very well between days three and seven, relaxing for three days if possible, and then giving a real push at the end when others would be most exhausted.

Winning at Waikerie

The actual competition flying worked out roughly as I had planned but with some modifications due to weather and placing. First, two days of rain on days one and two reduced the possible number of flying days to 12. The first actual contest day, too, had abominable weather, with bases around 2-3000 feet, much overconvection, and a very strong headwind on the first leg. This sixty-mile leg took the few that made it over three hours. One pilot took five! Obviously in such conditions survival was the key. Dick and I flew together most of the course, and the whole team was very cooperative in team flying. Most of the threats in the Open Class piled up near the second turn with negligible point spread. I tied for third with Grosse and Zegels.

The second day brought somewhat better weather but was still tricky. I was quite cautious and got my worst

placing of the meet, a sixth. The third day was only a little better in weather, with bases up to 3500 feet—sometimes—but Dick and I team-flew very effectively with me first for the day and he right behind me. This one-two state of affairs was very helpful as people began to talk about the "marvelous American team flying." The legend continued when on the next day (day four) Dick and I finished within seconds of one another, he second, I third.

Day five saw the first really good weather—at least for the first two legs. Things went well as I pressed hard, flying a good deal with Ax. His *Nimbus* outran mine, but mine outclimbed his markedly. Since I had full legal water (the Contest Committee had ruled against being more than 10% over original manufacturer's gross), I gathered that the mysterious foam package over Ax's wing spar was lead. Due to my better climb, I beat him handily on the weak final leg to win the day and move into overall first by 70 points over Grosse, 99 over Ragot.

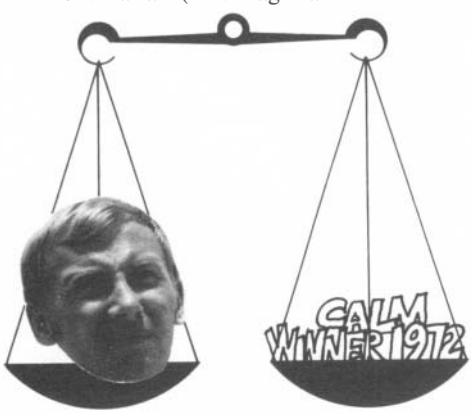
The sixth day promised genuine Australian weather for the first time, and the Task Committee celebrated with a skinny 440-mile triangle, the longest ever called in soaring competition. Launch time saw nothing very remarkable in thermals, so Dick started almost immediately at 2500 feet, guessing it would be a distance day. I started twenty minutes later to let a few more markers get out into the desolate Morgan area. Two hours later things had picked up so much that we were back near Waikerie from the first turnpoint 170 miles out, having averaged 85 mph under 8000-ft. bases with lift of 900 fpm and more.

Unfortunately the clouds ended fifty miles farther on. I was in the lead and pressed on into the blue, not expecting any significant change in conditions. As the altimeter unwound without a bump, I began to realize that we had entered a completely new air mass. The next four hours were hell, with low, ragged, infrequent thermals. Dick tried a detour south and got slightly better weather, and we arrived almost together at the second

turn. On the way home he missed one of the widely-spaced dry thermals and fell behind. Ragot and I flew together toward a dying bank of clouds 30 miles from home, but when we reached it, the lift was weak and uncertain. Ragot left in hopes of better things, but I, not liking the look of the overcast ahead, stuck with the weak lift until I had 30:1 on the field. Fifteen miles out I saw Ragot, impossibly low, heading for the field. We finally finished almost together, he first, I second, but I was happy with my conservative strategy as only ten ships finished at all and my lead on Grosse moved up to 106 points.

The seventh day proved a contest turning point. By now many pilots were obviously tired. Predicted weather called for good lift developing late. Not liking the look of things, I started fairly early and slowly. After 20 miles, lift picked up sharply, and I could hear Dick exulting in his late start. The second leg proved very weak and tricky, with bases down to 2500 feet at the second turn and little lift.

While circling at 2000 feet just out of reach of home, I got a call from Ben Greene, one thermal ahead, reporting good lift. I immediately headed out, to the great surprise of Klaus and others with whom I was circling. Arriving in Ben's excellent thermal at 1200 feet, I climbed rapidly and headed home to win the day. My ship was all tied down and put away when Klaus finally finished. He came over, saying, "George, you fly risky!" When I told him about Ben's message, he was furious, since his teammate had been in the same thermal as Ben and had not mentioned it. Fortunately for me, those who had believed the weather forecast and started late had either not finished at all (like Ragot and Johnson, among others) or had slow times (like Grosse in twentieth place). My lead was now 353 points with seven days flown and only three or four days remaining.



Needless to say, I decided to drop back to 95% effort, be consistent, and save energy. The last 5% of effort is enormously energy consuming. The Task Committee cooperated with a long call of 331 miles into the mountains to the west on day eight. I started early to be safe and had no real problems before the last turn. The final 70 miles into a strong wind and a dying sky proved tricky. Dick and I shared information and started a long final glide from 30 miles out, together with Ax. He, still with his extra ballast, flew slowly away, while Dick encountered an area of subsidence and fell below glide path. Finally at eight miles out, just comfortably making the field, I hit a little lift. Quickly calling Dick, I did one circle to mark the spot for him and headed on in to take a conservative fourth.

The ninth and tenth days were made to order for me, with two 315-mile triangles in generally good weather. My third and second placings increased my lead over Grosse who became obviously much more concerned with Ax and Zegels moving up on him than with beating me. I endeavored to look calm, rested, and ready for anything, although actually I was having trouble sleeping due to a heavy cough from the bronchitis. Doc Peter's pills and potions helped maintain the illusion of health, nevertheless.

The last day, the eleventh (making this the longest meet I had ever flown), gave promise of good weather. My lead was safe, so I continued at 95% energy level. The enormous strain on Ax, Grosse, and Zegels, fighting it out for second place, was clearly apparent. Grosse looked exhausted, and even the usually imperturbable Ax showed strain, a fact that may have contributed to his landing out at the first turn, one of the only non-finishers of the day. Zegels won the day, to take second for the meet; Klaus Holighaus, who had been flying better and better after the fifth day, took second to place fifth overall; I got third to win with 10,635 total points for the contest out of a possible 10,925 (the first day had been devalued) for an average of 974 points a day.

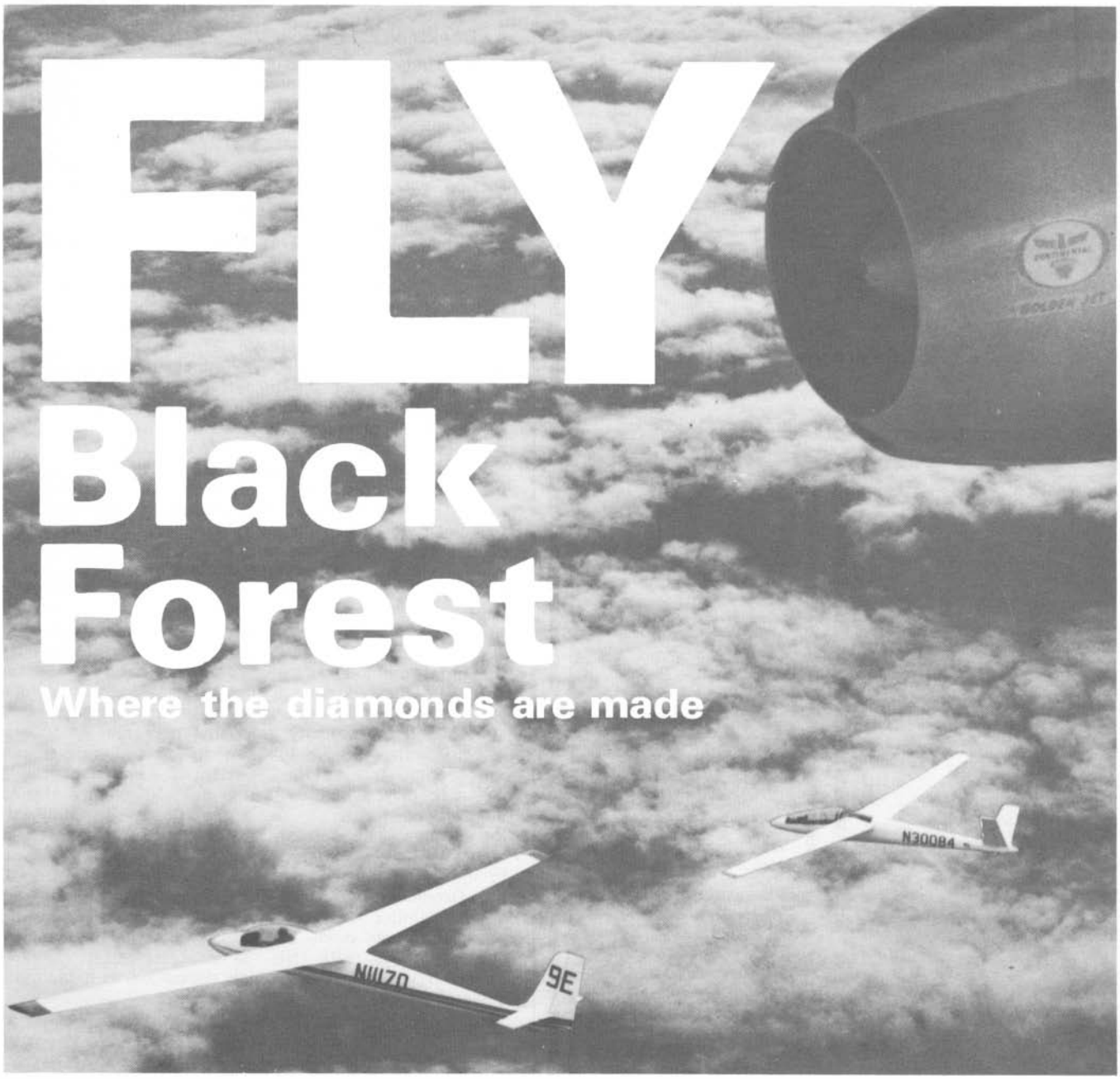
For me, Waikerie 1974 was my most satisfying and enjoyable meet, not just because I had become the first pilot ever to win the Open Class World Title twice, but because it was the successful culmination of a planned and systematic approach to a problem.

The Ingredients of Winning—A New Recipe

Some ten years ago I recall saying that winning depended one-third on equipment, one-third on skill, and one-third on luck. Today, however, the ship ingredient has diminished because superb sailplanes are available to all serious pilots. The skill ingredient has also assumed lower importance because the technological elements have become more widely known, thanks to excellent books by pilots such as Heinz Huth and Symposia such as those run each year by Ed Byars and Bill Holbrook.

Luck remains a constant. No pilot can look back on a contest without remembering the times when a fortunate thermal at low altitude made all the difference between being a hero and an also-ran. Although planning was, to my mind, a big part in my success in Liberal and Australia, so was the absence of bad luck. I cannot fly without remembering Neil Armstrong's words, "We don't wish for good luck, only the absence of the bad," and recalling Vrsac in 1972!

Since ship choice and skills are less of a factor, what then prevents a contest from being won mostly by luck? My feeling is that basic competitiveness and ability to treat personal energy as an apportionable and expendable resource, rather like altitude, largely supplants ship choice as the second major factor in an era when most competitors are flying similar ships. Finally, in a day when the top pilots have similar levels of skill, psychological assessment of the competition may well have supplanted technological skills as the third major winning factor.



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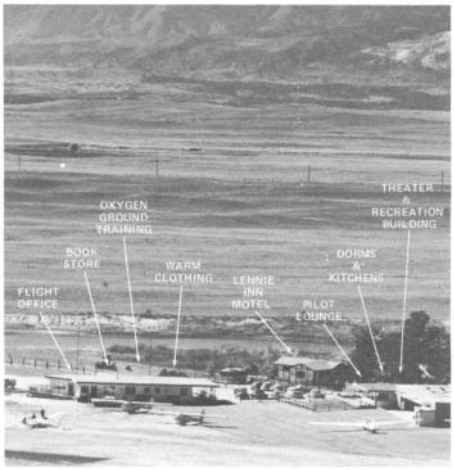

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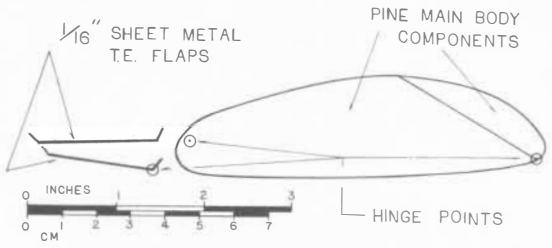

Figure 1: Scale drawing of section

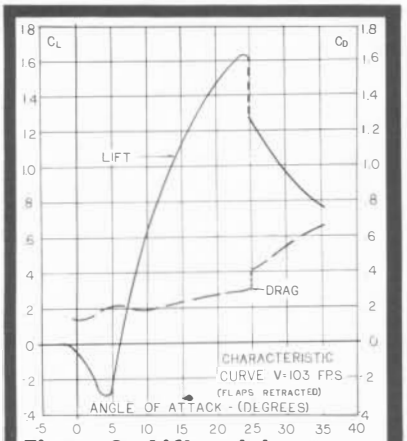

Figure 2: Lift and drag with flaps retracted

Photo 1: Bottom view of completed model

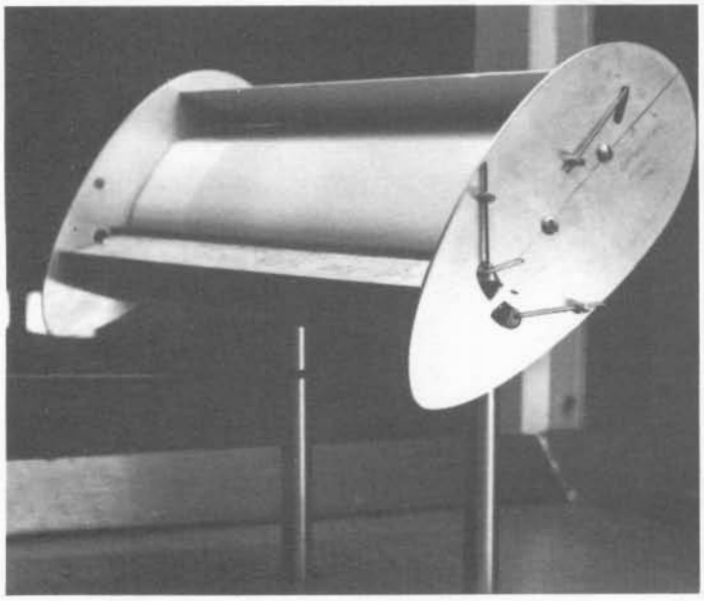

Photo 2: Rear view of model in tunnel

by DANIEL WALTON

An article on the Kasper Airfoil in the December 1973 issue of SOARING presented a unique approach for achieving increased lift at high angles of attack. Because only limited data was given on the degree of aid the flap system afforded, it seemed that a tunnel test of this concept would be helpful in providing further data. A scale wing section was designed with a 19-inch span and a 6-inch chord. It was to have two large end-plates for attaching the leading-edge and trailing-edge split flaps, the trailing-edge flaps being made of 1/16-inch sheet steel bent to the general shape shown in the article. (Fig. 1, photo 1) An iron-on mylar skin was used as a covering because of the extremely smooth finish possible in a short time.

After the model was completed, a trial run was performed in the tunnel (Photo 2). The tunnel has a test chamber 28 inches wide by 20 inches high with a three-point mounting for the model. Measurements of lift and drag are done with load cells and an electronic counter. As it turned out, the velocities were lower than desired because the drag load cell was rated at 10 pounds maximum. Since greater velocities would overload and possibly damage the expensive unit, it was decided to take the measurements at the lower velocities. These velocities were 103 and 73 feet per second respectively. The only undesirable tendency of the airfoil itself was a slight buffeting in the trailing edge split flaps at certain angles of attack. This buffeting was in the lower angles of attack where the flaps would not normally be activated. The next step was to visually see if the airflow was behaving as described; since no smoke generator was available on the tunnel, the thread-tuft method was used.

Setting the model at a high angle of attack where the vortex phenomenon was expected to occur, the tunnel was started and the velocity gradually increased. At the lower velocities the airflow followed in general the shape of the section, but as the velocity was increased the flow began to reverse itself. At this point it seemed unsteady, but with a further increase in velocity it stabilized in the reverse flow situation (Photo 3). This reversed boundary flow situation in the forward cavity would seem to imply the existence of the forward vortex sketched in the December 1973 SOARING issue. Visual observation showed similar reversed flow in the aft cavity. This same observation was made for several different high angles of attack, always with the same test result. Only the threshold velocity varied which decreased with increase in angle of attack.

Daniel Walton is a 21-year old senior in the Engineering Department at the Northridge campus of the California State University system. Although he is not a Society member, an SSA'er aunt passes along her old copies of SOARING to Dan. Thus, in last December's issue, he read of Witold Kasper's flying wing whose unique slot-and-flaps system sustains the aircraft at half its normal sink rate while flying at half its normal speed, according to its inventor. As far as is known, these claims have never been independently corroborated and controversy has been the result. Walton decided to investigate on his own; though a wind tunnel test might not be as good as careful flight testing, it was still better than verbal theorizing.

"Fortunately, I had the opportunity of killing two birds with one stone: Engineering 391, which deals with fluid mechanics, requires a special three-week project as part of the semesters' work. I rounded up two other students to form the required group, secured the permission of Dr. W. J. Rivers, the Department Chairman, and obtained the use of Northridge's slow-speed wind tunnel. This facility had some limitations for the thing we had in mind, but

t of the Kasper Airfoil

A final tunnel test gave measurements of lift and drag which were made with a constant velocity over a range of angles of attack. From these results lift and drag curves were derived. The activated configuration was done at two different velocities, the slower velocity being required to more fully determine the lifting characteristics without overloading the 10-pound drag cell, as mentioned earlier.

The graphed results of the activated section showed a marked difference from the lift and drag curves of a more conventional airfoil. The more orthodox configuration with flaps retracted gave a plot similar to that of a conventional airfoil (Fig. 2), so as to imply it is not a fluke of the model itself. First, (Fig. 3) at the higher velocity the activated configuration showed no clear-cut tendency to stall in the normal sense. Drag gave high values overall and did not increase in the parabolic manner usually associated with an airfoil. Second, both Figures 3 and 4 clearly show the transition region mentioned earlier. This would seem to be between 19 and 30 degrees angle of attack. Third, the L/D ratios were then plotted for the retracted section at 103 fps and the activated section at 73 fps. Even though this gives a difference in Reynolds number, it is felt that the L/D for the lower velocity gives a more complete picture. The retracted section's optimum setting was in the lower angles of attack and the activated section's optimum setting was in the higher angles of attack, thus indicating the Kasper Airfoil is better suited for higher angles of attack.

In the December 1973 article two figures for sink at high angles of attack were given. They were 200 fpm at 30 mph and 100 fpm at 20 mph. If we assume for small angles that

$$\frac{L}{D} = \frac{V}{V_{sink}}$$

we see that this means L/D's of 13.3 and 17.6 respectively. This conflicts sharply with the maximum value of 1.6 measured for the activated section in the experiment. This would seem to imply a high sink rate for the model.

In summary, tests showed the maximum lift coefficient for this model to be 2.98 at 50° angle of attack and that the drag in general was substantial in value. Visual results indicated the formation of the vortices induced by the flap system and that a buffeting problem may be encountered unless certain structural considerations are made.

This experiment was not intended to be an exhaustive study on the Kasper Airfoil but only to check out a prototype airfoil in the tunnel to acquire more detailed information as to the advantages and limitations of the unusual flap system.

I think we succeeded in working around them."

Although supersonic wind tunnels are part of the campus equipment, Dan is not glamorized (". . . guided missiles—yyechh . . .") and may be symptomatic of the current resurgent interest in low-speed aerodynamics. He is leery of super-specialization. "I would like to work somewhere that would permit me to deal with an entire system. I'm interested in homebuilding, small plants, and that sort of thing."

Could there be such a thing as an engineering Renaissance Man?

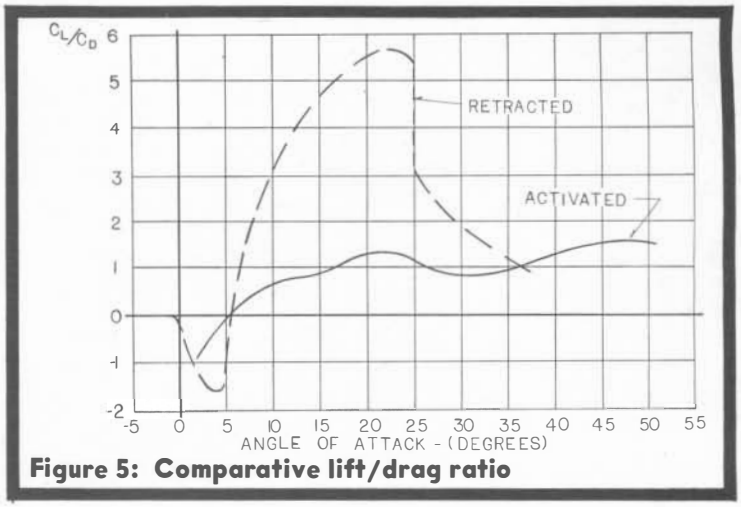

Figure 5: Comparative lift/drag ratio

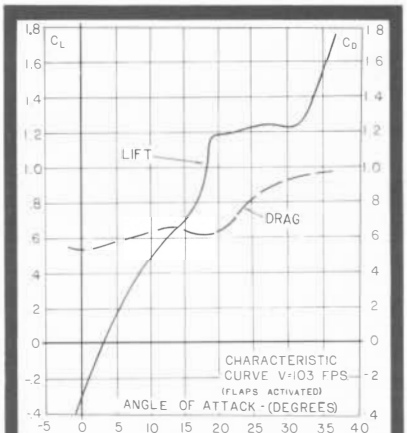

Figure 3: Lift and drag, flaps activated, 103 fps

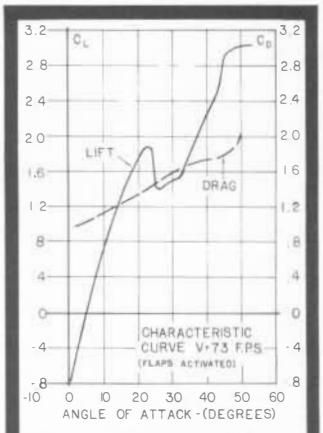

Figure 4: Lift and drag, flaps activated, 73 fps

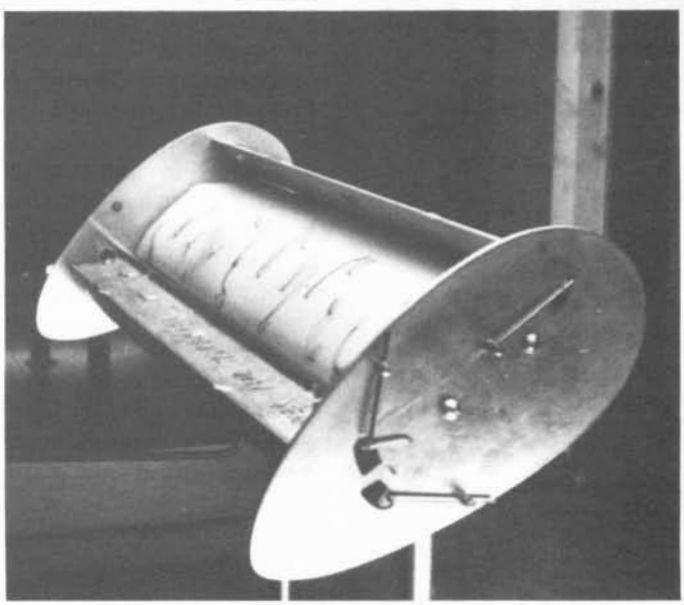

Photo 3: Tufts show reversed flow with activated flaps

The Wave of Mauna Kea

by WOODSON K. WOODS
photos by the author

Reprinted from
Arizona Air Currents

Away from these troubles,
from all the pain
That holds our lives
in its grey dominion
Happy is he,
who on powerful pinion,
Can soar toward a fairer,
more luminous plain!

His thoughts rising up
like larks, he will
Sail in the morning
high over the land —
His soul being free,
he will understand
The language of flowers,
and of things that are still!

BAUDELAIRE

The air is unusually smooth and the morning is bright and clear. We pass through nine thousand feet. With my free hand I adjust the oxygen mask into place and fasten the snaps onto the cloth helmet. The regulator is "on" and the blinker indicates a steady flow. I reposition the sun goggles and watch the taut yellow towline which links the 2-32 to the towplane.

We have crossed the green Waimea Plain now and pass above the Puu Laau cabin. I notice the yellow bloom on the mamani trees. A slight buffeting and a rise in the variometer indicates a strengthening of the wind velocity and a boost of ridge lift from the large Ahuamoa cinder hill off to my right.

I follow in position as a gentle three hundred and sixty degree turn is made over Pohakuloa to gain the needed summit height. The snow capped cones of Mauna Kea reflect brightly in the early morning light, their size accentuated by the shadows cast from the sun's slanting rays. I think of a gigantic marshmallow sundae.

The altimeter needle crawls to fourteen thousand feet under the pull of the laboring Cessna. We level and turn downwind for the crossing of the summit. The wave must be there! The wind has increased and we race close over the high cones of the white volcano.

Now! Over the summit and a pitch sharply downward in the lee flow—a strong downdraft—but hold on—just a few seconds—level again—and the variometer needle climbs! 200, 400, 500, 700, 1000 feet per minute up! Up! Solid and smooth. We're in the wave! I grasp the release knob and pull, bank away to the right and again into the magnificence of soaring flight.

It has been a long wait for this moment. A long wait, many attempts, little success. We have studied conditions, watched for the clouds—those beautiful lenticulars that occasionally indicate the formation of a wave. There has been much theorizing and discussion, many stories heard from the airline pilots and the comparisons with the textbook conditions. Charts have been made, wind directions and velocities plotted, and we have arrived at one unanimous conclusion—the high volcanos of Hawaii Island have the capability of generating mammoth waves in the upper atmosphere.

The night before, after winds aloft reports gave promise of the right conditions, we planned the flight. I would meet Max at first light at the Kamuela Airport. He would fly the Cessna Skylane and tow, and I would pilot the Schweizer 2-32 sailplane. She is a rugged and beautiful ship with a fifty-seven foot wingspan, has the good capabilities of a high performer, and for every mile aloft she will glide thirty-four. I like her stability and smooth handling qualities. A thick nylon snowmobile jumpsuit, heavily lined boots, and down-filled mittens completed the high-altitude gear, for temperatures could reach twenty below zero.

Our plan was to tow for contact with the wave at, or slightly below, the fourteen thousand foot altitude in the lee of Mauna Kea and, if contact was made, I would release and attempt to make at least a 3000-meter (9843-ft.) climb above this release point to earn the altitude portion of the FAI International Gold Badge soaring award and, perhaps, set the State Altitude Record for soaring

ight as well! But as before, many times, we could ncounter only zero lift or violent turbulence.

Now, moments after release, I swing in search- ng turns to find the strongest point of the wave. he slow maneuvers are incredibly smooth, the eedle of the vario moves on the dial, and I center" at 500 feet per minute up. Green air! teady lift!

I have the eerie sensation of not flying, not limbing, but rather the sensation of being borne loft. The distant sea, the mountains, and the land below take on a different meaning for, ithout clouds, one seems to lose the sense of epth. The mountains, the island, the sea begin o appear as one, a gigantic sectional relief map –an earthscape. I am not ascending, the earth- cape is falling away—slowly. The only alien tructure on the vast white summit below me is he observatory which, in its litter of construction, ad stood out so harshly against the snow. It, too, s now losing its identity.

Eighteen thousand, twenty thousand. Smoothly limbing. Rate of climb fluctuating slightly, but veraging 450 feet per minute.

I am feeling great wonder at the awesome pectacle and the silent power of the wave. The bsolute lack of motion, the smoothness and uietness, almost gentleness, are fearsome in heir silence. Further below I was more related o flight by creating turns in the form of figure ights to match the wind velocity with the speed f the ship, and to keep station over the ground. Now, with the wind velocity increasing with the igher altitude matching that of my ship's, I am overing, pointed into the strong flow of air

—suspended—and yet rising at a rapid rate.

Below, I find it difficult to identify the great cinder cone, I Makanaka, my position reference.

I am at twenty-two thousand feet.

I feel exhilarated and am at once stunned by the thought that I am living life in these moments with an intensity I have seldom felt before. All my senses are turned to the necessary tasks of the flight and the sensing of this massive flow of air. My nerves are taut and yet there is a restfulness in the compelling beauty of the adventure. The glistening white wings of my ship, the clarity and deep blue of the thin upper air, the expanding horizon. All of this is deeply concentrated and alive.

Far to my left, the great crater Mokauweoweo on Mauna Loa is entirely visible, standing out like a dark maw in the whiteness of the snow. To my right the island chain is spread on the seascape; I can see all the way to Oahu, and only then does distant haze limit the wonder of the scene. Little below seems to indicate habitation. An aloneness seeps through to me but, curiously, it seems to be welcome in such a place.

Ice crystals are now forming on the canopy in intriguing geometrics and diffuse the light in a many-hued prismatic effect which casts dancing colored beads about the cockpit.

A pulse has come through the wave! The needle of the variometer bounds upward to eight hundred feet per minute indicated climb. I sense a change and yet there is no change in the smoothness.

Twenty-five thousand feet!

I now feel the excitement of accomplishment. The gain is made! But there *is* a change! Even though we are rising rapidly, something *is* different. A slight sighing of air through the canopy latch, a hum of some member or outer skin of the ship; I hear these sounds with a tightening of anticipation. I am aware of the coldness. There is a chill in the heavy boots. There! The noise of the air is increasing.

Twenty-six thousand feet.

I feel motion. A slight buffeting grasps the ship. I glance below and find that I have drifted back, downwind from my station. No lift. The vario reads zero gain and the roughness continues. I push the stick forward into a shallow dive and attempt to penetrate the flow of air and regain my position. 70, 80, 90, 95 mph and I am barely making headway. A great increase in the velocity of the upper air must have occurred, forming a shear and throwing the wave out of phase, killing the lift. Finally, I am over the edge of the wave—over the summit. The air smooths. I have made it above 25,000 feet! That's good for the Gold Altitude and we must have set the State Record.

I race down over Mauna Kea, making lazy spirals in the still morning air. Far below, I see the brown trace of the summit access road and the dust from a few vehicles working their way up. Skiers, I guess. And I glance to the sea across the rugged, lava-scarred saddle country and curiously think of our popular island sport, surfing. It somehow relates—I have just surfed, incredibly removed and yet the same, on the great wave of air. Hawaii has it all!

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BUSINESS MEMBER

The Windsor Club's members report a feeling of being borne aloft on wings of song during winch tow. That's because their president has discovered an ingenious non-musical use for Spring Steel Music Wire.

wire cable

by HENRY PREISS

To begin with, few soaring clubs use both aero and winch tow. If aero tow is used by your club, you might want to skip this all together. I am equally proficient in both towing methods (approx. 400 tows each). I have no preference and do not intend to weigh the merits of either.

One of the more important parts of the winch is, of course, the cable. It is the one item that takes most of the wear and tear—it also breaks. There are basically three types of cable. Number one is a standard wire rope, available in many sizes. The annoying part of this cable is that a single strand will break and then ball up in front of the winch leading gear like a bird's nest. It is also advisable to use gloves when handling this cable. The cost is prohibitive and its lifespan is short. Number two is a shielded wire rope, it is most widely used. It was rather inexpensive surplus; the trouble is that it is not available anymore. That leaves number three, a single-strand piano wire. The Windsor Gliding Club has used this cable for eight years, and no doubt many other clubs will have to follow suit. This "cable" is called Spring Steel Music Wire, material spec. QQW 470 A. Tensile strength is 258,000 to 285,000 pounds per square inch for a .135-inch diameter. It is also readily available in any length. The price is $41.08 per hundred pounds for a 3000-ft. length (145 lbs.), and $41.06 per hundred pounds for 4000 feet (175 lbs.) and 5000 feet (233 lbs.) at Randall Roy Metals from Toronto, Canada. They also have offices in Detroit and Chicago.

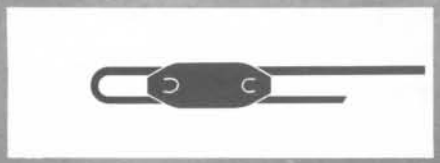
This cable never breaks unless it is misused by either the winch or the personnel handling it. Some winches will require a small modification. The top lead roller should not be less than 12 inches in diameter to avoid working (excessive flexing) of the material. It is also necessary to have a chute at the end of the cable; it has to be held taut at all times to avoid a coil. A small but good swivel is essential for a smooth operation, as is a good brake on the cable drum for retrieving. As far as the personnel are concerned, a little extra care goes a long way. If the cable lays in coils they have to be tended to. The cable retrieve can be fast, but no sudden stops or starts. Any overrun on the drum will cause the cable to coil and kink with a resultant break. There is no doubt it will take some time to educate everyone.

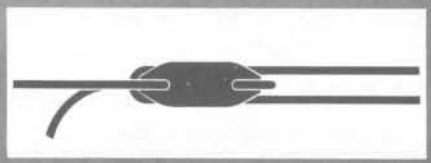
Finally, there are many ways to repair the cable. I had tried them, used them, and discarded them (including welding) until earlier last year when I had one of those rare moments (I saw a light bulb with "Ford" written on it). A new idea on splicing has worked so well that even with 15 splices in the cable we made 200 to 300 tows without a single break. The main part of the splice is a "nut" made from 9/16-inch diameter cold rolled steel, 1-inch long, both ends are rounded to the shape of a bullet. Four holes are drilled concentrically. One wire is led through the no. 1 hole, then doubled back through no. 3 hole. This is repeated with the other wire via no. 2 and no. 4 holes. The ends are then wound with a winding tool and, presto, the cable is as good as new! The time required for two men is approximately 5 minutes; tools required are a pair of "shure grips" and a piece of ¾-inch pipe. One end is cut in half for approximately 1-inch with a hole drilled in the half pipe section. This can then be used like a pipe wrench to wind the cable.

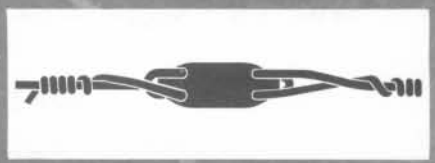
If you would like to make these splicing nuts yourself, I will supply you with a drawing.

With care, this cable lasts three to five years; cost is $75.00 for a 4000-ft. coil, which is really quite reasonable. Should you have any questions, please call or write me at 2050 St. Anne Street, Windsor, Ontario, N8N 1V7, Phone 735-3725.

There is no doubt that it will take some adjusting, but in the long run it is well worth it. The Windsor Gliding Club would not consider using anything but a solid strand cable. It is by far more reliable with the new splicing method than anything else on the market.







The Alleghenies Expressway

Although early soaring enthusiasts wrote about the ridge-soaring potential of eastern U.S. mountain chains, three decades would pass before Karl Striedieck established a route and tumbled world records in the process. Here is his road map. Now you can try it yourself.

by KARL STRIEDIECK

While waiting in an office a few weeks ago, someone recognized my name and recounted a soaring experience he had had "way back when." It was in 1937 and he was driving along the highway at the foot of Bald Eagle Ridge when he came upon a sailplane sitting in a field with the usual gaggle of curious spectators around a harried pilot. Upon striking up a conversation with the pilot of the gull-winged bird, he learned he was talking to Richard du Pont who was then in the process of winning the Nationals at Elmira.

I bring this up because du Pont was a pioneer ridge runner who recognized the potential of these mountains over forty years ago and in a publication titled *The du Pont Soaring Expedition* foresaw long flights like those that have come to pass in recent years. His predictions were remarkable!

For instance, on page 10 he is quoted, ". . . Another course of 620 miles appears likely with Knoxville, Tennessee, and the northern border of Pennsylvania as extremities." Later he adds, ". . . It appears possible that distances greater than 300 miles can be covered. The solution for such soaring may be found in the design of a sailplane which will sacrifice a little of its low sinking speed for an increase in normal gliding speed." Both of these conjectures have proven valid over the past few years, and I'm certain that there will be many more records achieved as time passes.

The Appalachians have been slope-soared for eons by our feathered counterparts, the hawks and eagles, during their migratory journeys. While the feathered birds use all the ridges of the mountain chain for a free ride, glass birds have found there is only one route of sufficient length and character for world-record caliber flights. This chain begins overlooking Williamsport, Pennsylvania, and goes 500 miles to a point just north of Knoxville, Tennessee. In the process of getting from one end to the other, there are gaps and other challenges to keep the ridge runner from falling asleep, but 95 percent of the distance is straight-out ridge running. Let's take a look at the Allegheny Soaring Expressway.

The first ridge is appropriately named Bald Eagle Ridge and runs unbroken 100 miles from Williamsport to Altoona, Pennsylvania, where a four-mile jump is necessary to get onto the next section, the Frankstown Mountain. This void is usually no sweat and can be crossed using inertial navigation — i.e., build up enough energy with your water-filled bird to coast straight across. At the end of 20-mile-long Frankstown Mountain (which, incidentally, has an active quarry with blasting at the top) is the longest gap of all — the seven-mile Bedford gap. Here one must use thermals or wave to get 1500 feet above the ridge to make the crossing. Depending on conditions this takes from two minutes to two hours—but once across, the worst is over.

Wils Mountain is the next ridge and it ends abruptly at Cumberland, Maryland, where one slips a mile downwind to the Knobby Mountains. The Knobbys are rather inferior for ridge soaring so it is best to ride higher in wave lift which abounds along here. Near Petersburg, West Virginia, the ridge regains its character and one can get back down among the leaves and bash along at redline speeds. The ridge changes its name after some distance to become known as North Fork Mountain. This was once a favorite nesting spot of golden eagles; as many as seven were spotted simultaneously as recently as the forties. (Last fall I saw a pair of eagles along here, and to prove it I shot all my turnpoint film taking pictures of them.) Another denizen of mountain wilderness, the raven, is seen frequently along North Fork.

The ridge continues past Blue Grass and Monterey and changes its name to Back Creek Mountain. Before reaching Mount Grove it is best to drop downwind to the next ridge (Jack Mountain) which ends 2000 feet above Carryton, Virginia. After that, it's back upwind again to Peters Mountain. This ridge zooms past Narrows, Virginia, where it changes its name to East River Mountain. Near Tazewell a couple of stepping stones are used to get to Clinch Mountain—and then it's 100 miles to the end of the ridge with no more breaks.

Ridge maps may be obtained from the U.S. Geological Survey. They are called Shaded Relief Maps and one is printed for each state. They cost $2.00 apiece.

A MIDAIR

by MARK A. SAVAGE

Sunday, August 25th, dawned fair with the promise of excellent soaring conditions at Marion Municipal Airport in Ohio. The field is the home of the Central Ohio Soaring Association which boasts 115 members, three sailplanes, and a towplane. Linda Huelsman and her husband Neil are both club members, and when they saw the weather, they were eager to get to the field—Linda because she wanted to try for her five-hour Silver C duration requirement, and Neil because he wanted to do some minor work on his BG-12. (Linda is still a student pilot, but very competent and quite close to getting her Private Pilot's License.) They were soon on their way to an experience that will live forever in the minds of the Huelsmans and COSA members.

With cumulus starting to form at 11:00 a.m., Linda got the permission of Russell Savage, the Operations Chief, to fly the club 1-26 on her duration attempt. Realizing that the good weather would attract members to the field, he agreed to waive the 45-minute weekend limitation on the condition that she would come down if he advised her via CB radio that another club member wanted to fly.

The launch was uneventful and before long she was soaring around 5000 feet. With conditions so good, several other sailplanes were soon airborne and taking advantage of the fine weather. Meanwhile, her husband had been busy working on his BG-12. Linda had been aloft over two hours when she called Neil advising him to come on up and that the conditions were great.

By this time more members were arriving at the field and wanting to fly. The Operations Chief realized he had to ask Linda to return and land. He switched on the set. Before he could speak, Linda's voice came on the air:

"Mayday! . . . Mayday! . . . Midair collision at 5200 feet!"

Everyone within range of the speaker was stunned.

"I am upside down. *Oh my God*—the left wing just came off . . . Someone please help me—now I am spinning!"

A totally unknown voice cut in.

"Everyone stay off the air. This is an emergency. Where are you?"

Linda's answer was high-pitched.

"It looks like I'm going to crash in a bean field three miles southeast of the airport!"

Instructor John Leupp and his student Jeff Edgell had been flying COSA's 2-33 in the vicinity when they caught sight of the spinning 1-26.

"I thought club ships aren't allowed to do aerobatics," Jeff said.

"They're not," John replied.

"Good God—it's hit the ground!" Jeff shouted.

Leupp grabbed the controls and applied full spoilers, racing for the airport to summon help.

Climbing in his BG-12 to join his wife, Neil first saw Linda loom up on his left side as he spiraled to the right. He had gotten the stronger edge of the thermal and had gained the 600-ft. difference in less than half a turn. Horrified, he saw his left wing contact the left wing of his wife's 1-26, tear into the structure, and then, in turn, rip off her left horizontal stabilizer and elevator. The impact popped off his instrument panel and the next thing he knew he was in a screaming 140-mph dive. He gingerly eased back on the stick and found he had enough control to maneuver back to the field for a landing.

Linda was now in a ship that was out of control. The Schweizer 1-26 was in a flat spin to the left. Approaching treetops indicated impact was near. Tucking up her left leg and pushing with all her might on the

OVER OHIO

right rudder pedal, stick full back, she pulled open the dive brakes. She was sure that everything she had been taught had been put to use to save her life.

Slowly, ever so slowly, the ship stopped spinning. At the same second it went into a slight left slip and hit the ground with a loud thud. The soy bean field acted as a cushion. Despite the crunching of metal, the ship's cockpit stayed intact!

Back at the field, club members rushed to help the badly shaken Neil from his cockpit, amazed that he was able to make a successful landing with eight feet of his left wing and part of the aileron missing. He was emotionally distraught, pleading with someone to get him to the crash scene but knowing full well what to expect. Jim McLurg took Neil in his Capri. He put it in low and let it rip. The tac needle rose to 6500 rpm—well above redline, but the engine didn't blow up and the Capri arrived at the crash site within a few minutes.

Linda could hardly believe it. She shouted with joy as the farmer came rushing over to her, fearing the worst. She had a few bruises on her knees and a small cut on her head. A few minutes later, an ambulance and an alert emergency squad summoned by the voice of the CB radio arrived on the scene. By the time she was sitting in the ambulance the Capri arrived with spinning wheels in a cloud of dust. Jim spotted Linda first.

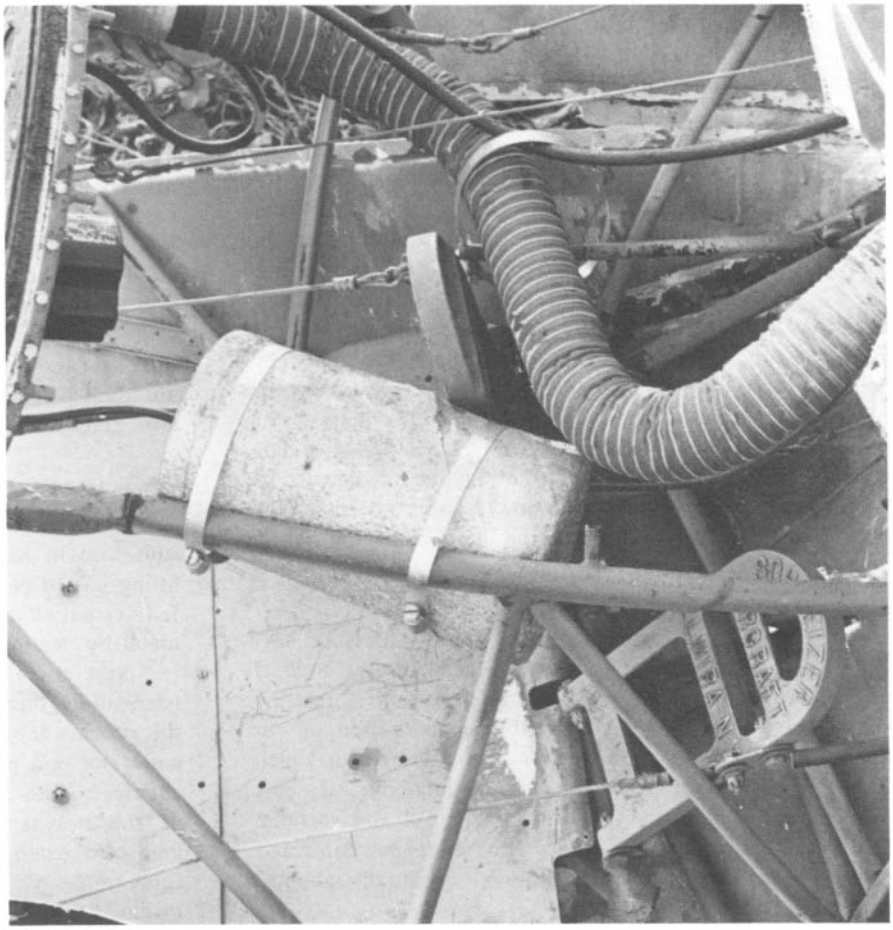
"Neil, she's alive!" he shouted.

There was a joyful reunion, and then, though she did not want to go to the hospital, Linda complied because of all those who feared that she surely must have sustained some type of injury. But all the X-Rays, blood tests, etc., checked out perfectly and Linda joked while she explained how the excellent training and the sturdy Schweizer 1-26 had kept her from leaving this world.

In due time the National Transportation Safety Board representative, local FAA personnel, and the State Highway people started piecing all the facts together.

The BG-12, a higher performance ship, rapidly outclimbed the 1-26, and, despite communications acknowledgements, the extra lift caught Neil by surprise. With both ships in a standard right turn, it was inevitable that a collision would occur unless a wider turn was made. Linda, staring as though hypnotized, watched Neil's wing looming larger and larger. She could not out-turn the faster ship. All she could do was wait. After Neil's wing cut across her left wing and left tail, her left wing actually bent over double and its bottom struck her main landing gear wheel, leaving a black tire mark, and then snapped back. She immediately went into a dive; at 2200 feet the outer left wing separated from the ship. It floated away and landed about a quarter mile from where she finally crashed.

In retrospect, this was an accident that will go down in the books as being incredible. There is no doubt the sturdy American-built Schweizer helped her survive, along with the fact that her number was not called up.



In reviewing past issues of Homebuilders' Hall it occurs to your editor that we need a change of pace. So, this month we'll get away from the drafting board, the calculator, the five-dollar words, and spend a little time in the shop looking for ways to make some of those little miscellaneous building jobs a bit easier, quicker, and better —in short, Handy Hints from Homebuilders' Hall (H^4). Here are some tricks you may find useful.

Cardboard Patterns

Whenever I have to install a piece of plywood or metal skin over a curved bulkhead or rib, particularly if the skin has an odd shape, I always try it first with a pattern made of No. 50 chipboard (thin cardboard, 20 cents for a 30" x 40" sheet at the stationer's). I make all my mistakes on this cheap material instead of expensive plywood or metal and am guaranteed a perfect fit after tracing the final pattern onto the skin material.

By the way, for cutting 1/16" plywood (or thinner), I use a razor knife instead of a saw. A straightedge and a couple of heavy weights to hold it down gives beautiful results. About three passes (the first one very light) will do it. But keep your fingers out of the way!

I use cardboard for other applications, too. For example, where I want to drive a nail that will be subsequently removed, I'll drive it through a little folded-over strip of cardboard with an ear sticking out. Later, after the glue has set, a pair of pliers on that ear lifts the nail right out. Of course, if I have a long row of nails to drive, I'll drive them through a wooden nailing strip or a sturdy piece of fabric tape. In the first instance the nails are subsequently removed by splitting the strip away from the nails and pulling them out. In the second, I raise the nails by wrapping the long loose end I've left on the tape around a hammer handle and rotating the handle against the nails, If you use this technique, be sure to rotate the bottom of the handle toward the nails with the fabric coming up over the top.

Sandpaper Blocks

Since my aircraft are constructed mainly of wood, my shop is full of sandpaper blocks—the handiest tools I have. They range in size from a quarter-inch square by six inches long (for knocking off corners buried in out of the way places) to an eight-foot long two-by-four which I use for final contouring of wing leading-edge ribs just prior to skinning. Once you find how useful and versatile a simple block or strip of wood with sandpaper cemented to both sides can be, your shop will eventually abound with them, too.

I use 40-50 grit open-coat paper, rubber-cemented to the block. Apply cement to both surfaces, let dry, and press together. It works fine. Besides, you can apply new sandpaper in a jiffy by stripping off the worn paper and applying the new. And you only have to apply the cement this time to the paper, not the wood. When you strip off the old paper the rubber cement seems to stay with the wood.

Rubber Cement

You can do a lot of things with rubber cement other than making sandpaper blocks. Sometimes I think I use more rubber cement than glue. Not for the aircraft, of course, but for things that help build it.

I use rubber cement for sticking sanding discs to the metal disc itself. It works better than the glue that is made especially for this purpose. About the time the abrasive is worn out, so is the rubber cement's adhesive qualities. The disc pops right off with a minimum of tugging.

I sometimes use rubber cement in the process of making metal fittings. If I don't want to transfer all the fitting dimensions from the plans to the metal, I'll simply trace the drawing (mine are *always* to scale!) onto a piece of tracing paper, cut it out roughly, and rubber-cement it to the metal. Then, I simply cut the metal close to the lines and finish up by disc-sanding exactly to them.

I have even rubber-cemented metal fittings together on occasions where I need temporary restraint while measuring, marking, or just looking.

When I built the *Ibex,* I had the task of working down the polyester resin which I used over the fiberglassed foam wing leading edge. I made quick work of this normally sweaty task by sawing a glass cinder block (available at plastic supply houses) into two-inch thick by three-inch-wide strips and rubber-cemented them to my eight-foot two-by-four. By working the two-by-four spanwise and chordwise at the same time I got a beautiful job. Of course the shop floor becomes deep in residue from the block (and it really cuts up the wife's linoleum floors) so watch your dirty shoes. Cinder block wears away rapidly, which is why you use it. Instead of clogging up like sandpaper, it simply wears away while doing its abrading of the resin. In the process of wearing down it also gives off an evil odor—something like rotten eggs.

Joggle Die

One of the most difficult and annoying tasks one often runs into in making metal fittings is in cases where the fitting has to be joggled. So what's a joggle? See Figure 1. It is essentially impossible to accurately joggle a piece of metal by beating it with a mallet.

About three minute's work in making a joggle die (depending on how big the joggle is, of course) makes the process a snap. As shown in the figure, you merely cut a slot in a piece of scrap metal the thickness of which equates to the amount of offset in the joggle. The width of the slot is the distance over which you want the joggle to extend. You slip the fitting into this slot and squeeze the whole thing in a vise. Take it out and, *voila!,* joggled fitting.

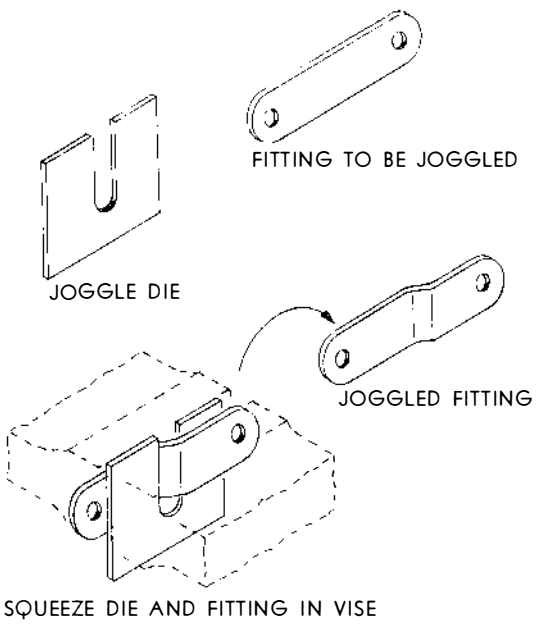


Figure 1: Joggling a fitting

Hole Finder

Every so often a builder, particularly a builder of a metal structure, has to match-drill to a blind hole. Example problem: Secure a fitting to a structure that has already been drilled. No holes in the fitting itself, yet. The objective is, of course, to drill the holes in the fitting to match the holes in the structure. The trouble is (if you can't accurately measure and transfer the location of the holes) that the new fitting covers the holes in the structure so you can't see them. They're "blind." Solution? Make yourself a Hole Finder, as shown in Figure 2.

To do this, first rivet a couple of long narrow strips of metal together and then drill a hole through both pieces at the opposite end. Epoxy a rivet to one of the pieces with the head on the inside. The rivet should be the diameter of the hole you're trying to find. Now, put the rivet in the hole in the structure, the one you're trying to match. Slip the fitting between the leaves of the Hole Finder, making sure to allow for reasonable edge distance. What you'll see is a hole exactly opposite the rivet, in the Hole Finder. Mark the fitting through this hole, remove the fitting and drill. Works every time.

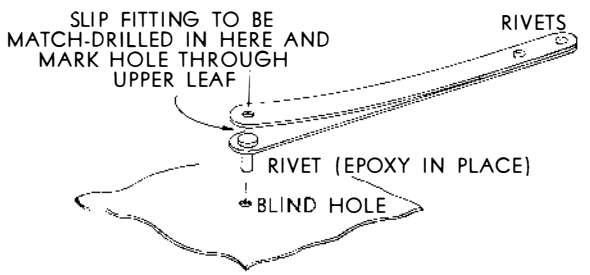


Figure 2: Hole finder and technique for application

Drilling Block

If one could drill every hole in a wooden structure in a drill press, there'd be no problem drilling at right angles to the material. However, this is impractical and few of us have the sharp eyes and steely nerves required to do it with a hand-held drill motor.

To make up for my lack of those attributes, I make a simple drilling block for the job. I drill the required size hole in a thick (like one-inch) piece of scrap metal or, if I don't have too many holes to drill, a piece of hardwood. I then C-clamp the block over the work and apply the drill motor. The block keeps everything straight, even, and at right angles.

To locate the hole properly in the aircraft (you can't see it after you clamp the block over it, right?) first touch the drill to the wood to make a good indentation. Then, with the drill removed from the motor, push the drill through the block, into the indentation. Carefully clamp the block in place, remove the drill, install it back in the motor and drill away.

Clamp for Threading Short Bolts

Sometimes you'll find that you want to cut additional threads on a bolt that is simply too short to hold in a vise and still provide enough length to go into the threading die. With round-headed screws the situation is impossible because the vise will damage the head. Solution: Drill a hole of the required diameter in a piece of scrap metal at least as thick as the bolt or screw diameter and saw a slot into it—and a little past it—from one end. See Figure 3. *Now* you can thread it because the slot permits the vise to bite down on the shank of the bolt or screw instead of the head. For larger bolts you can simply cut a slot in a matching-size nut. This has the advantage of permitting the vise to bite down on the shank of the bolt without damaging the threads.

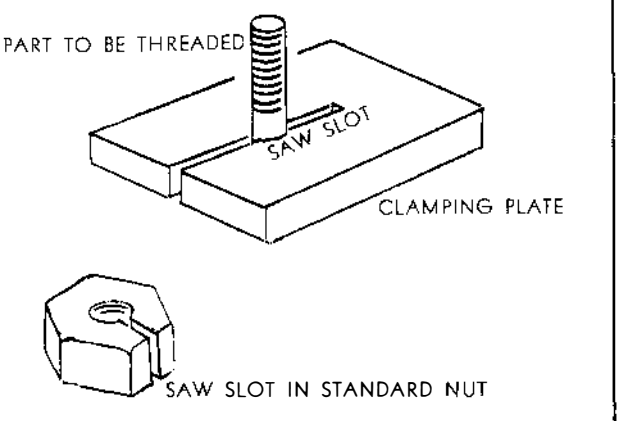


Figure 3: Two short bolt clamping techniques (Grip clamps tightly in vise)

Glue your Sailplane to the Bench

No, not the whole sailplane, only that part you can't get a C-clamp on!

There are numerous occasions during the construction of stress-skin wooden structures that demand the frame be secured precisely and rigidly while being skinned, and until the glue sets. D-tube wing spars are a good example. It is desirable, of course, that the builder plan his building procedure in such a way that he can clamp or bolt the structure down to something solid like the bench, a jig, or a fixture of some kind.

Sometimes, however, he will find that there is simply no way of getting a good hold on the structure because wherever he wants to install a clamp there is something in the way to prevent it, or soon will be.

The solution to this problem — and I've had to face it a number of times — is to glue the structure right to the jig. This assumes the use of a wooden jig, of course.

You glue the structure and the jig together at the required points through the use of corner blocks. After the skinning job is finished and the glue has cured, you simply chisel the block off and finish by sanding. You'll never see where the block was.

I prefer using epoxy for this kind of service because it doesn't require clamping pressure. I have used contact cement but it leaves a gummy residue that will drive you up the wall. It doesn't want to come off.

Cleaning Polyester Brushes

Almost everybody I know who uses polyester resin uses acetone, MEK, or other expensive solvent for cleaning resin-soaked brushes before they get hard and completely useless. Being a cheapskate, I have found a better way; TIDE soap and water. Performs magnificently. Takes the resin off your hands, too, and if you accidentally kick the can over, it doesn't constitute a fire hazard. In this connection, any builder whose shop isn't equipped with a good reliable fire extinguisher is asking for trouble.

A Quick-Connect for Push-Pulls

Dick Robinson, 48 Checkondon Drive, Rexdale, Toronto, Canada, M9W 2Y9, has come up with a quick-connect, ball-and-socket, push-pull tube modification for the aileron system on his HP-14T that is sure to be of interest to others. Observe the photo (Fig. 4). The text of his letter, in part, reads as follows:

"The connectors were obtained from the *Cirrus* dealer for $35.00 per pair, plus $1.00 for shipping. They are sold as right and left connectors, and there is a difference (which was of no consequence for my particular application).

"Obviously, one has to end up with the center of the new joint in the exact spot where the original holes are in the aileron rod end and bellcrank. To accomplish this I carefully cut about 1½" off the original push rods. My rods were slightly too large to fit in the socket fitting so they had to be machined down. The rod had a bend in it, so the end to be machined was put in the chuck only about 3/16", which was cut off after machining at low speed. The shoulder on the fitting was also ma-machined off.

"It was decided that the fitting couldn't tolerate welding to the 4130 steel push-pull without destroying the temper in the spring that comes with the connector. Therefore the pieces were drilled with a pair of 3/32" diameter holes at right angles to one another, and pins were inserted and peened over.

"The flaps on the HP-14T were set at minus 5° to

determine the bellcrank's minimum clearance between the flap drive tube and the square tube of the frame. It was found that 3/8"-thick aluminum stock could be used to house the ball fitting in the bellcrank, which had to be rebuilt. Three-eighth inch stock is about the minimum that can be used due to the diameter of the ball threads being approximately one-eighth inch. The original bellcrank was unriveted and each half bent to accommodate the 3/8"-2024 aluminum piece between them. The hand bending was tricky to accomplish without cracking the aluminum. The top 1½" of each half were then cut off to give 3/8" stock minimum clearance between the flap tube and frame.

"The 3/8" stock was then shaped and tapped (metric). The ball was threaded in and locked with a 1/16" countersunk rivet through the threaded shaft. The stock was then drilled, painted, and re-riveted to the bellcrank. Builders with sailplanes still under construction might prefer to make the whole bellcrank from 3/8" stock.

"The job was more involved than I had anticipated, but I'm sure it will pay off for me in terms of reduced rigging time."

Figure 4:
Dick Robinson's quick-connect for push-pulls

Sawing Out Metal Fittings

Using a bandsaw for sawing out aircraft steel fittings will be a snap if you install a slo-speed converter that Sears carries. Use a larger drive wheel than comes with your saw and, of course, a fine-tooth (32 to the inch) metal cutting blade.

If you're the adventurous type you can try this: I know of at least two builders who cut chrome-molybdenum steel up to 3/16" thick on a 1/3-horsepower bandsaw that has no slo-speed converter at all. They run the saw at full bore and simply *burn* their way through the metal. Also — and I hope you're ready for this — one builder even turns the blade around and saws on the *back* of the tooth! He says the metal gets a bit hot but the saw goes through it like it were cheese. He also claims that the blade cuts better when turned around — and he never has to buy new bandsaw blades!

Aluminum Paste and Powder

No matter whether you use Grade A fabric, polyester, dacron, Ceconite, Poly-fiber, or whatever, you must still use plenty of aluminum paste or powder in the dope to prevent the sun from rotting the fabric. If, after applying the aluminum, you can look down the inside of the wing

and still see the light coming through from the sun, you haven't applied enough.

Watch out when using aluminum paste or powder in nitrate (and probably butyrate as well) dope. The experts say that you should mix only enough aluminized dope to get you through the day. After a couple of days sitting around in the container the stuff apparently develops a nitric acid component that causes early fabric failure. So, mix only what you need.

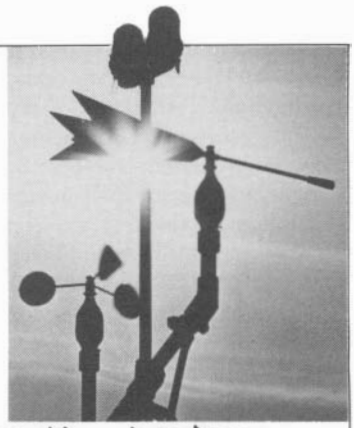
Technical Help for Designers

Bob Wister, member of the Homebuilders' Hall Professional Staff, has come up with an offer that is sure to spur a great deal of interest among our non-technically oriented designers. By way of introduction, Bob has spent a considerable number of years as an aircraft and aircraft equipment design engineer. He is also a sailplane pilot and instructor of long experience. He wants now to contribute to the advancement of sailplane design, and do so in a practical way. His offer is this:

Bob will donate engineering hours to designers who need analytical support. He sets forth only two requirements; one, the designer must be able to show that his design will make a meaningful contribution to the state of the art and, two, he must not offer the sailplane or the result of Bob's work for commercial purposes — unless he negotiates first with Bob, himself.

Bob Wister's address is 26256 Hickory, Hayward, Calif. 94544.

CHARLES V. LINDSAY



Using the WEATHER

Forecasting Thermal Strength

In last month's column, a basic method of determining how high flyable thermals extend was considered. Now, let's take a look at several graphs that will give us some idea of how strong the thermals will be on a given day. In general, the higher a thermal extends the stronger it will be. It is like a smokestack—the higher the stack, the stronger the draft. One conception of a thermal is a column of rising air that slopes in the direction the wind is blowing.

The forecast strength of thermals is of use mainly for flight planning. The stronger the thermals the faster the pilot can fly and the farther he can fly on a given day. The average rate of climb is more important than the occasional high rates of climb which cannot be achieved regularly. The following two graphs can be used with this average rate in mind.

Strength Of Dry Thermals

First, let's consider the vertical strength in *dry thermals*. In relating the maximum thermal strength or lift (L) to meteorological data (Figure 1), the maximum height (Z) of the dry adiabatic lapse rate (γ_d) is used again, the same height that we used for forecasting maximum thermal altitude. (*Soaring*, Oct. '74, p.44). For example, if the sounding you plotted shows that the dry adiabatic lapse rate will extend to 7000 feet above ground at the time of maximum heating, we would expect an average lift of 400 fpm. The data used to construct the graph showed that the lowest maximum altitude of the dry adiabatic lapse rate providing a lift of 100 fpm or greater was 3000 ft.

Thermal Strength Under Cumulus

In Figure 2 the maximum thermal strength (L) is related to the height (Z) of the Convective Condensation Level (CCL) as derived from the radiosonde soundings on days when cumulus clouds were observed. Note that this curve is steeper than the previous one. In other words, we would expect stronger thermals under cumulus based at 5000 ft. than in a dry thermal that extended to that level. Generally you are not at the top of the thermal when at the base of a cumulus cloud. Convection in the cumulus cloud is an extension of the convection below the cloud, although this is not always the case. Soaring pilots and meteorologists have noted that thermal strength is usually stronger in

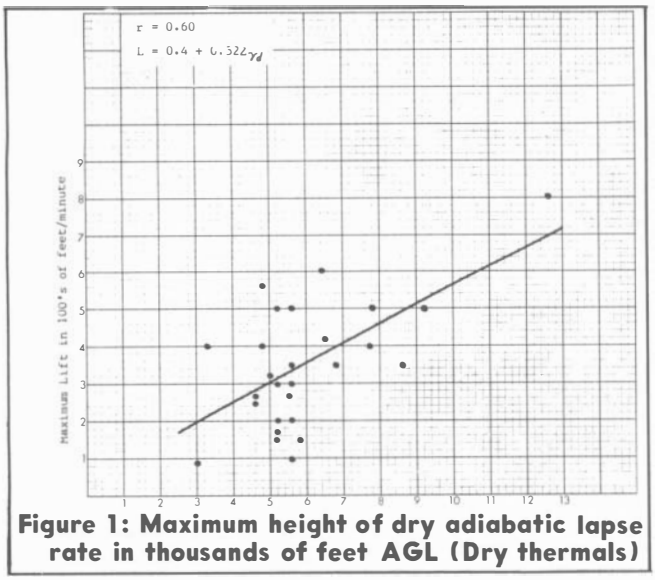


Figure 1: Maximum height of dry adiabatic lapse rate in thousands of feet AGL (Dry thermals)

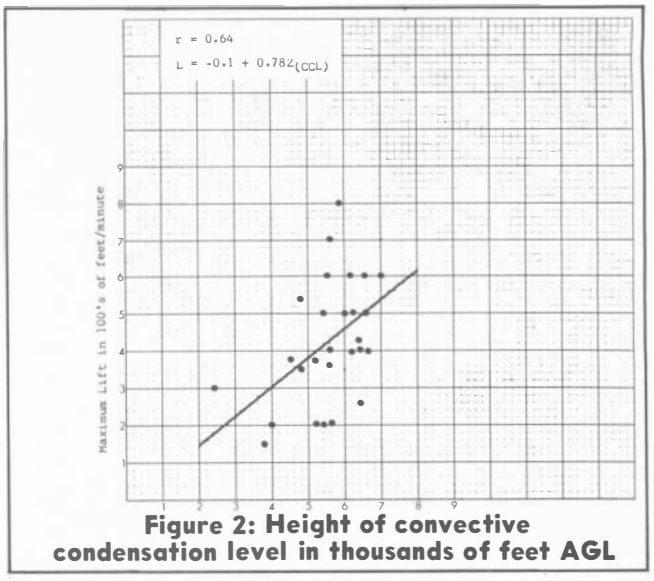


Figure 2: Height of convective condensation level in thousands of feet AGL

cumulus than below the cloud. Some of the increase in the thermal strength in the clouds can be attributed to the release of the latent heat of condensation. However, let's stay out of the clouds and fly safely and legally.

In the previous paragraph I mentioned the Convective Condensation Level (CCL). Do not panic! The best and most accurate way to obtain the CCL is from a National Weather Service sounding. We need to know what the dew point is for every level that the temperature is measured. With the proper instruments we could get this from our local sounding. But first, before we look at a simple way to determine the CCL, I again recommend to the reader who wants to delve into this subject further "Forecasting Thermal Conditions for Soaring" published in *Technical Soaring* (ref. 1).

Now let's get back to the CCL. The CCL is the height of the base of the cumulus clouds at any given time. If we know the surface air temperature and the dew point, we can readily estimate the level at which condensation will occur when air rises and cools. We do this by dividing the difference between the surface air temperature and the surface dew point by 4½ degrees F. The height of cumulus bases can thus be estimated in thousands of feet. For example, if the surface temperature is 80 degrees F. and the surface dew point is 62 degrees F., the approximate height of the base of the clouds (CCL) formed by this lifting process is 4000 feet (18 degrees F. $\div$ 4½ = 4). Now we wish to know *how strong* the thermals will be if the CCL or cloud base is 4000 feet. Figure 2 shows that a 4000 ft. CCL will give an average lift of 300 feet per minute. Again I emphasize that this is an average. As the graph shows, there are wide variations. We might consider this graph more useful forecasting lift under the average size cumulus and expect stronger lift under the rather tall towering cumulus. Suppose on the day that we had the 80 degree temperature forecast, the temperature actually rose to 85 degrees. At the time of maximum temperature, the cloud base would have been higher, at about 5000 feet, and therefore stronger lift would result. To forecast afternoon thermal strength use the average 9 a.m. local time surface dew point over the general flight area and the afternoon maximum temperature forecast by the National Weather Service.

Before we end this discussion I would like to note that before Mario Piccagli was kind enough to record seven years of flight data for me, I could only subjectively forecast thermals as being weak, moderate, or strong, based on experience. After constructing the charts we can now objectively put some numbers into the forecast of thermal strength. To get the best results from the graphs some experience is useful. These graphs were tested at Marfa, Texas, in 1970 during the World Contest, and they have been used by meteorologists at a number of national and regional contests with a fair amount of success. If desired, we could use the equations derived from the data to determine the thermal strength. The equation appears in the upper left corner of each graph. The correlation coefficient (r) is also presented.

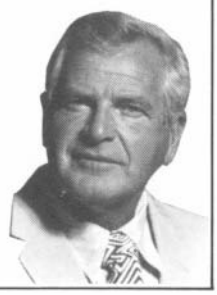
In previous columns we have discussed how to make a weather sounding, how to forecast thermal altitude, and how to forecast thermal strength. For cross-country and wave flying, knowledge of the upper winds is very important. The next how-to weather topic in this column will be, "Forecasts of the Upper Winds."

Reference

1. Chas. V. Lindsay, "Forecasting Thermal Conditions For Soaring", *Technical Soaring*, January 1972. Vol. 1, No. 3, pp 1-5.

SAFETY corner

WILL HAYES



The safety goal for SSA in 1975 is an accident-free year! A reachable goal? Yes . . . for the consequences of anything less than an all-out effort are not acceptable alternatives. With your cooperation the goal will not be merely reducing accidents, but eliminating them entirely. We *can* have an accident-free year, but it will require a concerted effort by every SSA member. If I'm faced with a go/no-go decision, my first commandment has always been this: "When in doubt—*don't!*" Add it to your pre-flight check list and you may join me as the two oldest living pilots around.

Since my appointment as SSA Safety Chairman, I have experimented with a variety of ways of compiling glider accidents. Most have proven less than successful, largely because of the dearth of information that comes through to me. I have concluded that we can elicit more rapid accident information through closer liaison with the National Transportation Safety Board and the twelve regional offices of FAA which roughly correspond geographically with the twelve SSA regions. To facilitate this process I am now looking for interested and concerned SSA'ers willing to act as Regional Deputy Safety Chairmen to collect and solicit accident/incident information from NTSB and FAA and forward it to me. If you are interested won't you let me or your Regional Director know?

In the meantime we can get some insight into the soaring safety record in the not-too-distant past by examining NTSB's three-volume report on aircraft accidents published in February of this year.

The report contains the essential items of information on over 900 General Aviation accidents that occurred in 1973. Among the 900 were 26 glider and four glider-towing accidents. These represent 3.3% of the total accidents reported in the U.S. The probable causes, factors, accident types, injuries, aircraft damage, operational phases, and flight conditions are given for each one.

These glider accidents represent a tragic loss of lives, aircraft, and equipment. Most of them can be traced to carelessness, foolhardiness, or inexperience . . . in short, pilot judgment. Since gliders constitute less than one percent of the pilots/aircraft registered in the U.S., the accident rate is out of proportion to the number of gliders and the amount of time flown.

Accidents don't only affect the persons concerned. They arouse a not-too-sympathetic public to demand tighter regulations. If this accident rate continues it could well mean the loss of more airspace, landing strips, and to further restrictions on freedom in the skies.

Because of space limitations, I am dividing the NTSB compilation in half and will run the remainder in next month's column. SSA'ers wishing more detailed information on these accidents may secure copies of the original factual reports from the Washington office of the NTSB. Minimum charge for each report is $6:00.

Pilot data: Private, age 39, 500 total hrs. (150 in type).
Date & Time: 4/13/73, 17:15 hrs.
Aircraft data: Schempp Cirrus, substantial damage.
Departure & intended destination: Maricopa, Ariz.; Tucson, Arizona.
Type of accident: Collided with fence, fence posts during landing roll.
Probable cause(s): Improper in-flight decisions or planning; rough uneven terrain.
Emergency circumstances: Forced landing off airport.
Remarks: Ran out of lift on x-c flight, landed on road, eight miles from destination.

Pilot data: Commercial, age 37, 1720 total hours (60 in type).
Date & time: 4/14/73, 17:00 hrs.
Aircraft data: Schempp Cirrus, damage substantial.
Departure & intended destination: Tucson, Arizona, & return.
Type of accident: Undershoot, groundloop swerve, landing roll.
Probable cause(s): Misjudged distance & altitude; unfavorable wind conditions, 20 knots.
Remarks: Landed about 100 feet short, downdraft. Left wing dug into ground.

Pilot data: Commercial, age 35, 667 total hours (one in type).
Date & time: 4/22/73, 14:45 hrs.
Aircraft data: Schweizer 1-34, damage substantial.
Departure & intended destination: Tehachapi, CA; local.
Type of accident: Stall on final landing approach.
Probable cause(s): Attempted operation beyond experience/ability level, lack of familiarity with aircraft, improper in-flight decisions or planning, misjudged distance & altitude, failed to maintain flying speed.
Remarks: Retractable wheel, pilot entered pattern too low on final approach.

Pilot data: Student, age 40, 13 total hours all in type.
Date & time: 4/22/73, 09:45 hrs.
Aircraft data: Schleicher II (?), damage substantial.
Departure & intended destination: Charmita Airport, Fairfield, PA; local.
Type of accident: hard landing, leveloff/touchdown.
Probable cause(s): Improper leveloff.
Remarks: Damaged fuselage, wing attach fittings bent.

Pilot data: Private, age 54, 279 hours (7 in type), serious injury.
Date & time: 5/12/73, 13:45 hrs.
Aircraft data: Blanik L-13, damage substantial.
Departure & intended destination: Plymouth, Mass.; local.
Type of accident: Undershoot, collided with dirt bank.
Probable cause(s): Pilot failed to follow approved procedure; misjudged distance and altitude; terrain rough & uneven.
Remarks: ACFT Operation manual best speed 47 mph. Strong wind normal or heavy sink, add wind speed to glide speed.

Pilot data: Student, age 50, 93 hrs. all in type, serious injury.
Date & time: 5/13/73, 14:20 hrs.
Aircraft data: Schweizer SGS 15(?), destroyed.
Departure & intended destination: Livermore, CA; local.
Type of accident: Stall and spin.
Probable cause(s): Failed to obtain/maintain flying speed.
Remarks: Crashed on hillside. Fixed single center wheel.

Pilot data: Commercial, age 43, 360 hrs. (8 in type), serious injury to passenger.
Date & time: 5/26/73, 1:15 hrs.
Aircraft data: Schweizer 2-33, damage minor.
Departure & destination: El Mirage, CA; local.
Type of accident: Undershoot in landing pattern, circling.
Probable cause(s): Pilot misjudged distance and altitude.
Remarks: Left wing hit ground.

Pilot data: Commercial, Flight Instructor, age 54, 1418 hrs. (182 in type).
Date & time: 5/27/73, 16:00 hrs.
Aircraft data: H-301B Libelle, damage substantial.
Departure & destination: Ephrata, Washington.
Type of accident: Undershoot.
Probable cause(s): Pilot exercised poor judgment; misjudged distance and altitude.
Remarks: Picked another field for landing at about 50 ft.

Pilot data: Student, age 43, 13 hrs. in type, serious injury.
Date & time: 5/28/73, 12:05 hrs.
Aircraft data: Schweizer 2-33A, damage substantial.
Departure & destination: Elsinore, CA; local.
Type of accident: Collided with wires/pole.
Probable cause(s): Improper operation of flight controls; misjudged distance, speed, and altitude; selected unsuitable terrain.
Factor(s): Operational supervisory personnel; inadequate training procedures, high terrain obstructions.
Remarks: Pilot high on approach. Made 360-degree turn. Unable to make airport. Hit pole in field. No instruction in off-airport landings.

Pilot data: Student, age 18, 21 total hrs. (1 in type).
Date & time: 5/29/73, 12:00 hrs.
Aircraft data: Schweizer 1-26, substantial damage.
Departure & intended destination: Borrego Springs, CA; local.
Type of accident: Undershoot; collided with object, final approach, leveloff/landing.
Probable causes: Improper in-flight decisions or planning; misjudged distance and altitude.
Factor(s): Lack of familiarity with aircraft; airport conditions.
Remarks: Misjudged distance from airport; unable to make normal pattern; tried to land on ramp; cleared bushes, wing caught wire.

Pilot data: Commercial, Flight Instructor, age 36, 111 hrs. in type.
Date & time: 6/13/73, 17:45 hrs.
Aircraft data: Schleicher Ka-6CR, damage substantial.
Departure & intended destination: Ionia, Michigan; local.
Type of accident: Hard landing, collided with trees during landing roll.
Probable cause(s): Improper leveloff; improper recovery from bounced landing; not aligned with runway/intended landing area.
Factor(s): High obstructions.
Remarks: Aircraft bounced on touchdown about 50 feet west of landing area; hit tree.

Pilot data: Commercial, age 31, total hours 11 in type, serious injury to pilot but not passenger.
Date & time: 6/16/73, 13:43 hrs.
Aircraft data: Schweizer 2-22, no damage.
Departure & intended destination: Huntley, ILL; local.
Type of accident: Turbulence; collision with ground during landing, level-off/touchdown.
Probable cause(s): Inadequate preflight preparation, and/or planning; initiated flight in adverse weather conditions.
Factor(s): Turbulence associated with clouds and/or thunderstorm activity; unfavorable wind conditions.
Remarks: Serious injury, no aircraft damage, unprepared area, passenger unknown, ten-minute flight.

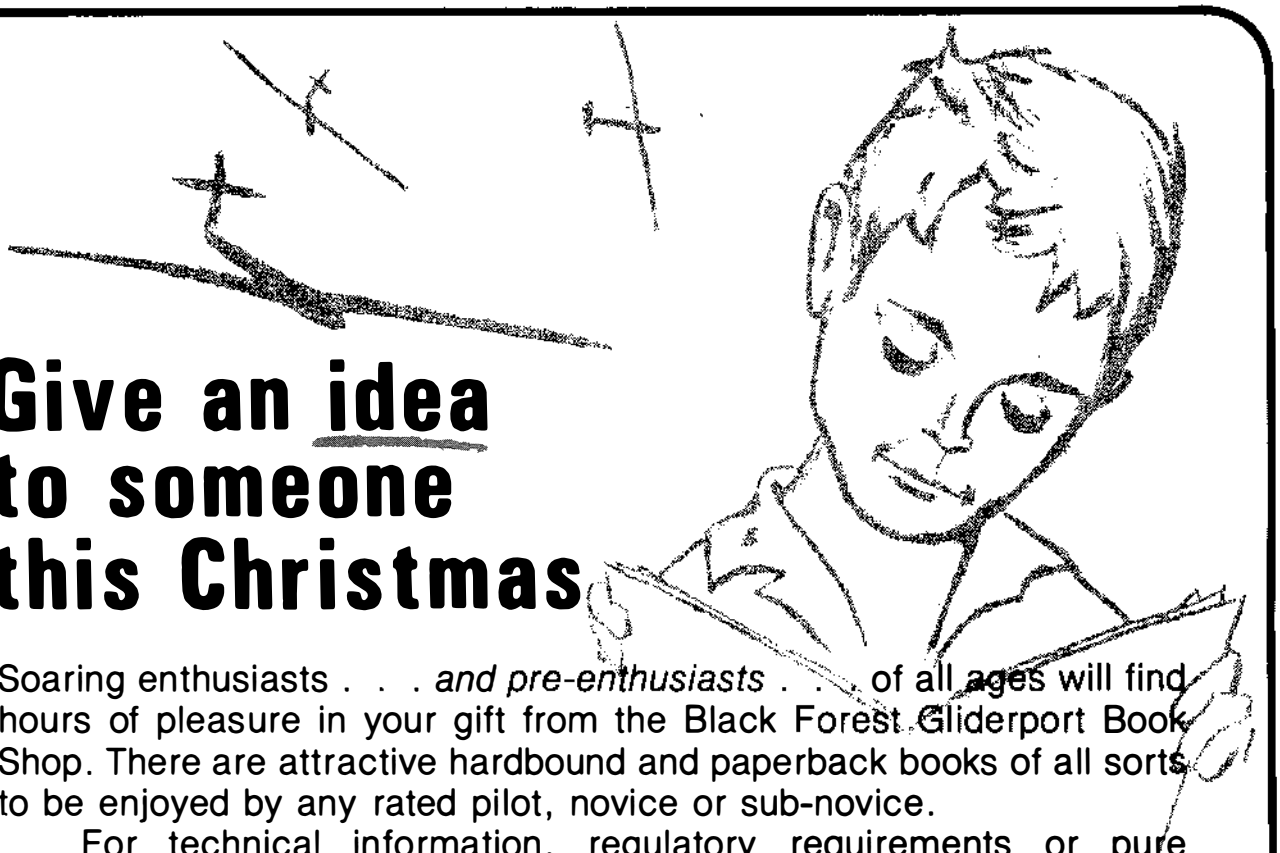
Pilot data: Private, age 42, 75 hrs. (3 in type).
Date & time: 6/17/73, 13:30 hrs.
Aircraft data: Schweizer 1-26, damage substantial.
Departure & intended destination: Oviedo, FL; local.
Type of accident: Collided with trees on final approach.
Probable cause(s): Improper in-flight decisions or planning; improper compensation for wind conditions.
Factor(s): Lack of familiarity with aircraft, high obstructions.
Remarks: Flew north of field searching for thermal; found none; hit tree during approach to road.

Pilot data: Private, age 39, 626 hrs. (262 in type).
Date & time: 7/5/73, 13:00 hrs.
Aircraft data: H-301 Libelle, minor damage.
Departure & intended destination: Charnita Airport, Fairfield, PA.
Type of accident: Collided with object during landing roll.
Probable cause(s): Selected unsuitable terrain.
Remarks: Pilot elected to land east side of runway to keep retrieve short. High grass at runway edge.

Pilot data: Student, age 33, 7 total hrs. (1 in type).
Date & time: 7/30/73, 16:00 hrs.
Aircraft data: Schweizer 1-26E, substantial damage.
Departure & intended destination: Kutztown, PA, Airport, local.
Type of accident: Overshoot, collided with object during landing rollout.
Remarks: House trailer parked beyond landing area.

Pilot data: Commercial, age 31, 350 total hrs. Fatality.
Date & time: 7/8/73, 12:15 hrs.
Aircraft data: Nimbus IIIB, destroyed.
Departure & intended destination: Air Sailing Gliderport, Nevada.
Type of accident: Airframe failure in flight.
Probable cause(s): Towrope failed to release for undetermined reason. Wings, spars, overload failure.
Remarks: Auto/Glider tow system used.

Pilot data: Age 51, 189 total hrs. (140 in type).
Date & time: 7/9/73, 16:43 hrs.
Aircraft data: Blanik L-13, substantial damage.
Departure & intended destination: Turf Airport, Phoenix, AZ, local.
Type of accident: Collision with ground during takeoff & initial climb.
Probable cause(s): Inadequate preflight preparation and/or planning. Improper operation of flight controls.
Factor(s): Failed to use checklist.
Remarks: Glider spoilers extended prior to takeoff. Released by towplane at low altitude.



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293. Thomas C. Beaman (Intl. 1442)
294. Theodore D. Schirtzinger (Intl. 1465)
295. Springer Jones (Intl. 1466)
296. Duane Eisenbeiss (Intl. 1467)
297. Harry A. Greene (Intl. 1470)

International Number Assigned

1436. James F. Munn (U.S. 290)
1437. E. Gene Hammond (U.S. 291)
1438. Vincent L. Guy (U.S. 292)
1443. Louis B. Feierabend (U.S. 289)

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872. Joseph E. Schwager
873. John W. Firor
874. Edwin M. Salkeld, Jr.
875. Thomas E. Daniel
876. Alfred G. Seidler
877. Eugart Yerian
878. James H. McClintick
879. Rudy F. Stadelmann

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2673. Clifton E. Lind
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2694. Ronald K. Holliday
2695. Billy G. Maples
2696. Kenneth G. Voigt
2697. Lynda G. Beran
2698. Dieter B. Meyer

ALTITUDE DIAMONDS

16,404-ft. gain

John Sinclair; Duster; Minden, NV (Wave)
Hans Vandervlugt; 1-34; Refugio, TX

DISTANCE DIAMONDS

310.7 miles

Thomas Beaman; 313 miles from Moriarty, NM; Std. Libelle; 6:19 hrs.; June 11.
Duane Eisenbeiss; 311 miles from Hobbs, NM; Std. Cirrus; 4:30 hrs; July 22.
Edward Fredkin; 311 miles from Hobbs, NM; Std. Cirrus; 4:38 hrs.; July 22.
Robert Gaines; 329 miles from Saginaw, TX; Phoebus; 6:34 hrs.; July 8.
Harry Greene; 332 miles from Air Sailing, NV; Std. Libelle; 6:20 hrs.; July 20.
Donald Gurnett; 311 miles from Hobbs, NM; Std. Libelle; 5:37 hrs.; July 22.
Robert Hart; 318 miles from Frederick, MD; Austria SH; 7:30 hrs.; July 21.
Robert Jackson, Jr.; 398 miles from Hutchinson, KS; HP-14; 7:00 hrs.; August 3.
Springer Jones; 311 miles from Hobbs, NM; Std. Cirrus; 4:46 hrs.; July 22.
Rudy Stadelmann; 322 miles from Pearblossom, CA; Libelle; 6:12 hrs.; August 11.
James Walker; 318 miles from Frederick, MD; LS-1; 7:30 hrs.; July 21.

GOAL DIAMONDS

186.4 miles O&R or Triangle

Paul Branch; Libelle; Frederick, MD
Robert Carl; 1-34; Colorado Springs, CO
Robert Carver; HP-14; Hearne, TX
William Chapin; Edelweiss C-30S; Frederick, MD
Donald Derry; 1-26; Colorado Springs, CO
Robert McKay; Vasama; Minden, NV
John Murphy, Jr.; 1-26; Caddo Mills, TX
Kent Reitz; AS-W 15; Fort Collins, CO
Theodore Schirtzinger; Kestrel; El Mirage, CA
Joseph Schwager; Phoebus; Endicott, NY
Rudy Stadelmann; Std. Libelle; Pearblossom, CA
Robert Zirkle; AS-W 15; Ephrata, WA

GOLD BADGE LEGS

Altitude: 9842-ft. gain

Gregory Coln; 1-26; El Mirage, CA
Thomas Daniel; Libelle; El Mirage, CA
William Fathauer; BG-12/16; Estrella, AZ
Galen Fisher; 1-34; Hemet, CA
John Grant; Phoebus; Taos, NM
Terry Haug; LP-49; Rosamond, CA
Bohuslaus Kahut; 1-26; Colorado Springs, CO
John Lincoln II; Diamant 18; Phoenix, AZ
Clifton Lind; 1-26; Hobbs, NM
Rodney Rubert; Blanik; Henderson, NV
Joann Shaw; 1-26; Snyder, TX
John Sinclair (See Dia. Alt.)
Rudy Stadelmann (See Dia. Dist.)
Hans Vandervlugt; 1-34; Refugio, TX
Rainer Zuleeg; 1-26; El Mirage, CA

Distance: 186.4 miles

John Bourland; HP-14; Caddo Mills, TX
Paul Branch (See Dia. Goal)
Robert Carl (See Dia. Goal)
Robert Carver (See Dia. Goal)
William Chapin (See Dia. Goal)
Edward Fredkin (See Dia. Dist.)
Robert Gaines (See Dia. Dist.)
James McClintick; Cirrus; Pepperell, MA
John Murphy, Jr. (See Dia. Goal)
Edwin Salkeld, Jr.; 1-23; El Mirage, CA
Joseph Schwager (See Dia. Goal)
Alfred Seidler; 1-26; El Mirage, CA
Steven Sliwa; 1-34; Elmira, NY
Rudy Stadelmann (See Dia. Goal)
Eugart Yerian; HP-14; Odessa, TX
Robert Zirkle (See Dia. Goal)

SILVER BADGE LEGS

Altitude: 3281-ft. gain

Ronald Adler; 1-26; Robbinsville, NJ
Herman Anderson; 1-26; Estrella, AZ
William Batesole; 1-26; Canaan, CT
Ronnie Black; 1-26; Tulsa, OK
Albert Blackburn; Ka-8B; Frederick, MD
Leonard Blackburn II; 2-33; Frederick, MD
Dale Boyer; 1-26; Lexington, VA
Robert Brodbeck; 1-26; Pearblossom, CA
George DeMott; 1-26; El Mirage, CA
Stephen Duresky; 1-26; Colorado Springs, CO
Dana Eggert; 2-33; Colorado Springs, CO
Carol Elliott; 2-22; Elmira, NY
Robert Embleton; Cirrus; El Mirage, CA
Bernard Fairfield; 2-33; El Mirage, CA
Russell Folwell; 1-26; Colorado Springs, CO
Lloyd Foster, Jr.; 1-26; Pearblossom, CA
Edward Fredkin (See Dia. Dist.)
G. W. Freeman; Pilatus B-4; Wurtsboro, NY
David Fuller; Ka-7; Bryan, OH
William Graham; 1-26; Colorado Springs, CO
Charles Gray; 1-34; Toughkenamon, PA
Malcolm Green; 1-26; Marion, OH
Arthur Haseltine; 1-34; Colorado Springs, CO
Raymond Hemann; 1-26; Pearblossom, CA
Seth Hetherington; 1-26; Robbinsville, NJ
David Jackson; 1-26; Springfield, VT (Wave)
Lawrence Jones; 1-26; Dansville, NY
Jan Juknievich; 2-33; Colorado Springs, CO
Richard Kirkland; Dart; Hutchinson, KS
Donald Kubek; 2-33; Moriarty, NM
John Lambing; 1-26; Colorado Springs, CO
Clifton Lind; 1-26; Georgetown, TX
John Lord, Jr.; 1-26; Wiley-Ford, WV
Howard Loveless; 1-26; Hemet, CA
Matthew Lyon; 1-26; Dansville, NY
Michael Machat; Pilatus B-4; Elsinore, CA
James Maciejewski; 1-26; West Bend, WI
Jeffrey Maples; 2-22; Robbinsville, NJ
Gayl Masson; 2-33; Colorado Springs, CO
Kenneth McDonald; SHK-1; San Marcos, TX
Paul Meisenbach; BG-12; Marietta, PA
Everett Miller; 1-26; Elsinore, CA
William Nesse; 2-22; Steamboat Springs, CO
Jerry Owen; 1-34; Refugio, TX
Bradley Perkins; 2-33; Highland, IL
Joseph Personett; 1-34; Colorado Springs, CO
Stephen Piner; 1-26; Plymouth, CT
Keith Pool; Ka-8; Tulsa, OK
Dirk Prather; 1-26; Colorado Springs, CO
David Reece; 2-33; Estrella, AZ
Terry Richmond; 1-26; Huntington, WV
Fred Roberts; 1-26; Estrella, AZ
David Robinson; 1-26; Colorado Springs, CO
Alex Rogers; 1-26; Robbinsville, NJ
Clifford Rose; 1-26; Pearblossom, CA
Hugo Salinas, Jr. (Certified to Mexico)
Guillermo Salinas P. (Certified to Mexico)
Thomas Samuels, Jr.; 1-34; Colorado Springs, CO
Earl Schmitten; 1-26; Elsinore, CA
Joseph Schoonover; 1-26; Elmira, NY
Per Schuh; 1-26; Wurtsboro, NY
Timothy Shears; 1-26; Ionia, MI
David Sidway; 1-26; Springfield, VT
John Sinclair (See Dia. Alt.)
Kenneth Sliwa; 1-34; Big Flats, NY
George Smith III; 2-33; Colorado Springs, CO
Frank Sokol; Blanik; Hailey, ID
Reinhard Thiel; 1-34; El Mirage, CA
Paul Volgamore; 1-34; Refugio, TX
Fred Wofford; 1-26; Fort Collins, CO
Francis Wozniak; 1-26; Blairstown, NJ
Ronald Zelazo; 1-26; Estrella, AZ
Marlene Zirkle; AS-W 15; Ephrata, WA

Distance: 31.1 miles

Michael Bayer; 2-22; (Turf) Phoenix, AZ
Lynda Beran; Sisu 1A; Elsinore, CA
Oscar Buchmann; Blanik; El Mirage, CA
Robert Carl (See Dia. Goal)
Elliot Cogswell; 1-26; North Springfield, VT
William English, Jr.; 1-26; Elmira, NY
Gerald Finch; 1-34; Lawrenceville, IL
Kenneth Fowler; Ka-6CRPE; Grand Prairie, TX
Edward Fredkin (See Dia. Dist.)
Ronald Holliday; Pilatus B-4; Erwinna, PA
Frederick Jacobs; SF-27M; Canaan, CT
Robert Kolter; Tern; Lawrenceville, IL
Clifton Lind; 1-26; Georgetown, TX
Billy Maples; 1-26; Robbinsville, NJ
Charles Montgomery; 1-34; Pearblossom, CA
Wilbur Robinson; 1-26; Dansville, NY
Elzie Rupe; 1-26; Fort Collins, CO
James Ryan; 1-34; Elmira, NY
Don Shearn; 1-34; Taos, NM
Steven Sliwa (See Gold Dist.)
T. Guy Spencer, Jr.; 1-34; Norfolk, MA
Rudy Stadelmann (See Dia. Goal)
Curt Thielemann; 1-26; Pearblossom, CA
Kenneth Voigt; 1-26; San Marcos, TX

Duration: 5 hours

Aland Adams; 1-34; El Mirage, CA
Edith Albrecht; Std. Libelle; Frederick, MD
William Batesole; 1-26; Springfield, VT

Mark Boster; 1-26; Tucson, AZ
Leslie Buck; 1-26; Elmira, NY
Stillman Chase, Jr.; Ka-6E; Santa Ynez, CA
Mark Clarkson; Quicksilver B; Phoenix, AZ
James Crisp; 1-26; Hobbs, NM
Frederick Elling; 1-26; Tucson, AZ
Ernesto Estrada; Cirrus; Odessa, TX
Georg Felkel; 1-26; Franconia, NH
John Firor; Std. Cirrus; Fort Collins, CO
James Fox; 1-26; Estrella, AZ
Ormond Gigli; 1-26; North Adams, MA
Ralph Huth; Ka-6E; Franconia, NH
Benjamin Kelsey; 1-34; Lexington, VA
Clifton Lind; 1-26; Georgetown, TX
Julian Martin; 1-26; Tucson, AZ
Dieter Meyer; Phoebus; Channahon, IL
Roy Miller; 1-26; Cumberland, MD
Henry Nixon, Jr.; 1-26; Middletown, NY
Paul Paris; 2-33; Slatington, PA
William Russell; 1-34; Horseheads, NY
Tomasz Serkowski; 1-26; Tucson, AZ
John Shafer; 1-26; Hilltown, PA
Joseph Smith; 1-26; Phoenix, AZ
Frank Sokel; Blanik; Hailey, ID
Ben Stanton; 1-34; Estrella, AZ
Douglas Tidwell; 1-26; Estrella, AZ
Bruce Wickmann; Diamant 16.5; Ionia, MI
Paul Wolfe; 1-26; Marion, OH

Altitude/Distance

John Bourland (See Gold Dist.)
Stillman Chase, Jr.; Ka-6E; Pearblossom, CA
James Crisp; 1-26; Hobbs, NM
Edmond Dvorak; 1-26; El Mirage, CA
Judith Hutchinson; Ka-8B; Frederick, MD
David Knight; 1-26; Blairstown, NJ
Murray Koerner; 1-23; El Mirage, CA
Robert Main, Jr.; Swallow; Hutchinson, KS
Alan Seitel; 1-26; San Marcos, TX
Kenneth Sorenson; 1-34; North Adams, MA

Altitude/Duration

John Campbell; 1-26; Frederick, MD
Peter Coira; 1-26; Caddo Mills, TX
Gregory Coln (See Gold Alt.)
Mike Culwell; 1-26; Caddo Mills, TX
Harold Hughes; 1-26; Estrella, AZ
Bohuslaus Kahut (See Gold Alt.)
David Mathes; 2-33; Estrella, AZ
Philip McArdle; 1-26; North Adams, MA
John Parker; AS-K 13; Frederick, MD
Robert Savage; 1-26; Hemet, CA
Fred Schroeder; 1-26; Fort Worth, TX
David Sliwa; 1-26; Elmira, NY
Albert Stirling; 1-26; Waller, TX
Kenneth Voigt; 2-33; San Marcos, TX
Richard Yelverton, Jr.; 1-34; Madison, MS

Altitude/Distance/Duration

Judith Silverman; Pilatus B-4; Fairfield, PA

C BADGES

30-minute flight

7029. Calvin L. Ailen
7030. Demitrios Athens
7031. Richard A. Baldwin, Jr.
7032. Peter Beckett
7033. William Boris
7034. James H. Bridges
7035. William A. Bruce
7036. Hank Bull
7037. Richard C. Burkhardt
7038. Richard C. Calkins
7039. Betsy A. Campbell
7040. Daniel A. Carrico
7041. Stephen A. Clegg
7042. Jeffrey S. Duhaime
7043. Diana J. Easley
7044. Frederick H. Elling
7045. Edwin P. Emanuel
7046. Bruce Ericksen
7047. Harry Felder
7048. Terence P. Fennessy
7049. Dorothy D. Gardner
7050. Jan I. Gilhousen
7051. Robert W. Gordon
7052. Dietmar W. Hell
7053. Ronald K. Hadel
7054. Charles R. Hoyt
7055. Hermann J. Irrek
7056. Peter Jordan
7057. Gary L. Joseph
7058. Edward F. Kingman
7059. F. David Kintler
7060. Charles L. Lindsay
7061. Jeffrey N. Losey
7062. Martha M. Maierbacher
7063. Jeffrey B. Maples
7064. Gayl A. Masson
7065. Michael K. Maxwell
7066. Rickey H. McClure
7067. Michael B. McGinty
7068. George A. Meffan
7069. Michael J. Newman
7070. Jonathan C. Noetzel
7071. Riley D. Owens
7072. Eric L. Pakosta
7073. John A. Pallante, Jr.
7074. Ronald E. Parsons
7075. John A. Patterson, Jr.
7076. John A. Patterson, III
7077. Bradley A. Perkins
7078. Kip V. Pool
7079. Jerri Ralls
7080. Richard K. Reiling
7081. Terry R. Richmond
7082. Fred M. Roberts
7083. Hugo Salinas, Jr.
7074. Guillermo E. Salinas Pliego
7085. James K. Sanders
7086. Rodney D. Savage
7087. Bernard M. Scribner
7088. Walter J. Seaborn, III
7089. George W. Smith, III
7090. Michael R. Stephens
7091. John P. Sullivant
7092. Harrison M. Terrell
7093. Heinz Weissenbuehler, Jr.
7094. Carl R. Wolfe
7095. Patti M. Wright

B BADGES

5-minute flight

Richard A. Baldwin, Jr.
William C. Ballard
Michael J. Barrett
Reva K. Beason
Peter Beckett
William Boris
John T. Brent, Jr.
William A. Bruce
Richard C. Burkhardt
Betsy A. Campbell
Daniel A. Carrico
Barbara A. Cooke
Charma L. Cooper
Frederick E. Crispin, III
Theodore H. Davis
Raymond A. Duhaime
James K. Dunlap
Dana Ann Eggert
Frederick H. Elling
Bruce Ericksen
Barbara Fehr
Jeffrey B. Glover

Gerald A. Gustus, Sr.
Ronald K. Hodel
Robert R. Imsande
Peter Jordan
Sandra L. Kalinowski
Joel C. Lambert
Morton L. Leiser
Lannie C. Lesher
Gayl A. Masson
Margaret M. Mateer
Michael K. Maxwell
Edith F. McClure
George A. Meffan
Edward C. Metcalfe, Jr.
Axel E. Meyer
Riley D. Owens
John A. Patterson, Jr.
John A. Patterson, III
Kip V. Pool
Jerri Ralls
Fred M. Roberts
Colleen R. Rominger
Todd S. Roze
James K. Sanders
Walter J. Seaborn
Mark S. Segall
George W. Smith, III
David U. Stilwell
Kenneth J. Stuckas
John P. Sullivant
Michael Tempel
Frank L. Vasold
Mark G. von Hagke
Volkmar von Hagke
Heinz Weissenbuehler, Jr.
Michael Willey
Lionel A. Williams
Patti M. Wright

RECORDS APPROVED

U.S. National, Arizona; Multiplace; Open; Speed for 300-km. Triangle; 65.251 mph (105.012 kmph.); Joe Lincoln, 2-32; June 26; Scottsdale, Arizona.

California; Single-place; Feminine; Distance; 418.8 mi.; Helen R. Dick; Cirrus; July 20; Rosamond.

Maryland; Multiplace; Open; Out & Return; 109.8 mi.; Dieter S. Schmidt; AS-K 13; Aug. 8; Frederick.

Maryland; Std. Class; Speed for 100-km. Triangle; 56.5 mph.; Calvin Walker; Schneider LS-1C; July 31; Frederick.

Maryland; Std. Class; Out & Return; 109.8 mi.; Robert N. Hart; Std. Austria SH-1; Aug. 11; Frederick.

Missouri; Single-place; Open; Alt./Alt. gain; 11,135 ft./9000 ft.; Frank J. Lilly; SHK-1; July 20; Grain Valley.

Missouri; Single-place; Sr./Std. Class; Speed for 100-km. Triangle; 58.2; Carl H. Koenig; SH-1; Aug. 3; Grain Valley.

Missouri; Single-place; Sr./Std. Class; Speed for 300-km. Triangle; 42.9 mph.; Carl H. Koenig; Std. Austria SH-1; June 25; Grain Valley.

New Jersey; Single-place; Sr.; Speed for 200-km. Triangle; 33.8 mph.; Raymond F. Clapp; HP-13.5; Aug. 25; Robbinsville.

New Jersey; Single-place; Sr./Std. Class; Alt./Alt. gain; 8950 ft./6975 ft.; Jay Rodney McIntire; Schreder RS-15; July 20; Millville.

New Mexico; Single-place; Open; Speed for 100-km. Triangle; 95.37 mph.; Tom Brandes; Glasflügel 604; June 20; Taos.

New Mexico; Std. Class; Alt. Gain; 12,560 ft./Al Santilli; UTU; May 27; Moriarty.

New Mexico; Single-place; Open/Std. Class; Speed for 300-km. Triangle; 61.9 mph.; Hugh M. Bivens; Std. Libelle; June 11; Moriarty.

New Mexico; Std. Class; Alt.; 20,616 ft.; J. R. Grant; Phoebus A; June 21; Taos.

RECORDS CLAIMED

World; Multiplace; Open; Speed for 100-km. Triangle; 88.73 mph (142.8 kmph); Klaus Holighaus (Germany); Janus; Aug. 15; Samedan, Switzerland.

U.S. National, California; Std. Class; Speed for 100-km. Triangle; 75.8 mph.; Manfred Sczesny; Std. Cirrus; September 9; Adelanto.

OTHER LONG FLIGHTS

Non-badge flights over 250 miles

July 9; Beverly E. Howard, Jr.; 560 mi. from San Marcos, TX, to Wichita, KS; SHK; 8:05 hrs.

Aug. 15; Kenneth H. Arterburn, Jr.; 414 mi. from Refugio, TX, to Healdton, OK; AS-W 15; 7:51 hrs.

Sept. 7; Tom H. Bernatz; 354 mi. from near Pearblossom to near Bishop, to Trona, to China Lake, CA; Kestrel.

Sept. 23; Kurt Reupke; 291 miles from Wurtsboro, NY, to Kerhonkshon, NY, to Manada Gap, PA, and attempted return; Ka-6E; 9:15 hrs.

Classified Advertising

The rate for classified advertising is 35¢ per word (or per group of characters). A fee of $8.00 is charged for each photograph (subsequent insertions of the same illustration—$5.00). The closing date for accepting ads is the 20th of the month preceding publication (the magazine is published and ready for mailing to subscribers on the 15th of the month preceding the cover date). Thus the deadline for receiving a classified ad for, say, the May issue would be March 20th. Send ad, photo (color or b&w print but no slides, transparencies, or negatives), and check (payable to SSA) to:

Classified Advertising Department
SOARING Magazine
Box 66071, Los Angeles, Calif. 90066

SAILPLANES FOR SALE

1-35. Schweizer's new dreamship. See it at your Southern California Schweizer Dealer, Great Western Soaring School, Box 148, Pearblossom, Calif. 93553. (805) 944-2920.

1-34A. One-half partnership or whole. New York area. (914) 374-5333 evenings: (914) 374-8191.

SCHWEIZER 1-23G (excellent), instruments, trailer, parachute. Fred Davis, 1309 Warwick, Portage, Michigan 49081. (616) 327-1019.

1-26, serial #204. New paint, trailer, instruments, A-14 oxygen. $4700. Lee Claxton Tweed, (714) 462-3298.

1-26B, excellent condition, with sports canopy and new instrument panel. No collect calls. (305) 238-2761 after 6 p.m.

SCHWEIZER 1-26C, serial #285, 100 hrs. T.T., good condition. $3850 or make offer. K. Kraemer, 570 35th St., Manhattan Beach, Calif. 90266. (213) 545-8287.

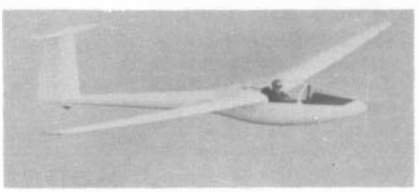
1-26C. Badly damaged. $450. Arthur Pauly, 22961 Enadia Way, Canoga Park, Calif. 91307. (213) 346-9128.

1-26C, serial #248, T.T. 290 hrs. Instruments, trailer, oxygen. Licensed to 4/75. Excellent condition. $5300. (805) 969-0454.

1-26C, EXCELLENT CONDITION. All-metal flush-riveted wings, filled leading edges, new fabric and paint. New: Winter vario, helio airspeed, altimeter, Replogle barograph. $4500. Evenings: (212) 767-2503 or (201) 944-7435.

1-26E, #533. Basic instruments and Ball T.E. vario with audio. Clock, Always hangared. Must sell. $5500. Mich. (313) 663-9202 eves.

1-26E, serial #557, total time 65 hrs., fresh annual. Equipment list: altimeter, Winter vario, Ball vario w/audio, compass, air vent, wingtip wheels. Scott pressure-demand oxygen system, Mentor TR-12 radio, antenna, battery. G-meter, total energy venturi, deluxe paint job. With Universal Schweizer trailer. $8750. Glider Aero Co., (213) 424-8480, 424-4700, or (714) 828-6126.



KESTREL 19. First and second 1974 British Nationals, winner 1974 OSTIV cup. More performance per dollar than any other Open Class ship! FAA ATC'd. Fall 1974 deliveries available. Kestrel 22 coming soon! Graham Thomson Ltd., 3200 Airport Avenue, Santa Monica, California 90405. (213) 398-4714.

SLINGSBY T-45 SWALLOW. Instruments, oxygen, trailer. Less than 50 hrs. total time. Sister ship to "Termite Van." $3250. Albuquerque Soaring Club, Box 11254 Sta. E., Albuquerque, N.M. 87112. (505) 299-5688.

SLINGSBY SKYLARK 4, 18-meter. U.S. ATC'd, full panel, oxygen, chute, enclosed factory trailer. $4300 firm (919) 723-0877.

ZANONIA RS-1. Excellent condition. Instruments and open trailer. Original log books, 29:1 L/D. All for $3500. Dean McMillian, 6109 Kimberly Circle, Las Vegas, Nevada 89107. (702) 878-9069.

ZUGVOGEL IIIB, 37:1 wood wing, newly painted, open trailer, metric instruments, oxygen. $7000. See p. 72 Aug. *Sailplane Directory*. Max Grassfield, Denver, Colorado (303) 733-0677.

BG-12A, CF-RCU, fiberglassed. Wings filled, aircraft repainted last winter, yellow and blue. Instruments, oxygen, covered trailer. Always stored in trailer, excellent condition. $3800. Willing to deal. 11950 56th St., Edmonton, Alberta, Canada. Phone: days 424-9174, eves. 474-6318.

BG-16, fuselage nearly complete. 18-meter laminar flow wings, fully filled. Previously flown with 40:1 glide ratio. With trailer. Ken Hornbrook, 633 Norumbega, Monrovia, Calif. 91016. (213) 359-5027 or 797-4448.

LP-49, 400 hrs. T.T. Radios, audio, parachute, oxygen, barograph. (714) 925-8774 evenings.

DIAMANT 16.5 plus enclosed trailer. No instruments. Damage to top of tail fin. $6000. Contact Irving R. Jorgenson, 831 Fair Lane, Northbrook, Ill. 60062.

DIAMANT 18, complete, $11,000. (See Oct. issue.) J. Lincoln, 1724 N. 32nd Street, Phoenix, Ariz. 85008. (602) 267-1895.

NIMBUS II. A NIMBUS has won the last three World Open Class Championships. FAA ATC'd. Write for brochure and delivery information. Rainco, P.O. Box 20944, Phoenix, Arizona 85036.

SH-2, enclosed trailer, licensed. (415) 841-9203 mornings.

AUSTRIA SH-1. 370 hrs. Full instruments, radio, cameras, parachute. Enclosed metal trailer. $5500. (404) 292-3074.

AUSTRIA SH-1, 1964. Prime shape. Enclosed trailer with easy fittings. Winter combination airspeed/vario, BSW audio vario, Cook compass, Brittain T&B, Genave 10-channel, A8 oxygen. Complete, $6600. Less instruments and radios, $5500. Call days (212) 577-2325 or write T. Pratt, 1133 Park Ave., New York, N.Y. 10028.

PILATUS B-4, total time 40 hrs. Fully instrumented, tinted canopy, boom mike, retractable gear, all-metal. This price only at this year-end closeout. $10,950. Sport-Aviation Inc. (216) 262-8301.

PILATUS B-4. Appalachian Soaring has new, instrumented, all-metal, aerobatic, Swiss made, ATC'd Standard Class sailplane in stock for immediate delivery. $11,950. Will aerotow or trailer to your site at cost. See Blanik advertisement. (301) 774-9457.

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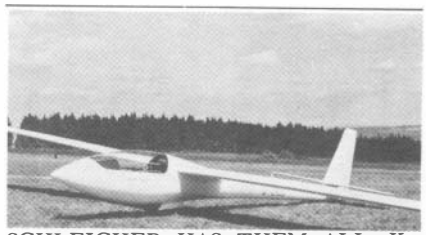
IMMEDIATE DELIVERY of Pilatus B-4's! Four new and one used B-4 located in L.A. area at Glider Aero Co., Long Beach Airport, Calif. Two in the Boston area at Yankee Aviation, (617) 746-7337, and one ship at Southeastern Sailplanes, Marietta, Ga., (404) 422-5577.



SCHLEICHER HAS THEM ALL. Ka-8C 15-meter trainer and club ship. AS-W 15B, 15-meter high-performance glass ship. AS-W 17 ultimate performance for the Open Class, and the new AS-K 18 for the sport class enthusiast. Write for information and delivery schedules. Schleicher Sailplanes, Inc. P.O. Box 118, Port Matilda, Pa. 16870.

AS-W 12, see October *Soaring*, Butler.

AS-W 15, closed trailer, water. Inquire: S. du Pont, 160 Long Meadow Rd., Fairfield, Conn. 06430.

AS-W 15, LIKE NEW. Serial #15113. Bare ship and trailer, $9900. Write for complete details. Tilgren, Rt. 4 Box 81, Alpharetta, Georgia 30201.

CONCEPT 70. Fully instrumented, water ballast. Refinished by Fred Jiran to better than new condition and performance. Enclosed all-metal custom-fitted Schweizer trailer. P.O. Box 433, Calistoga, Calif. 94515. (415) 591-4066 weekday evenings.

PHOEBUS B, 1969. 130 hrs., T.T. Like new, never damaged. Instruments include Ball electric vario, Bayside 990. Enclosed trailer. Best buy in Standard Class glass. (305) 636-5150.

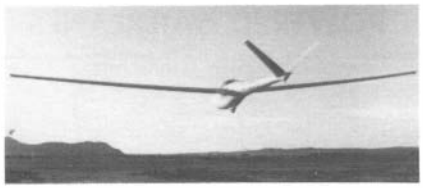
ESTATE SALE—Phoebus C, 130 hours since new, always hangared. With trailer, parachute, oxygen, barograph, and radio. One owner, mint condition. R.A. Morse, 411 Queen Anne Dr., Chula Vista, Calif. 92011.

PHOEBUS C, just annualed, and trailer. $9000 or half partnership available. Cumberland, Md. Bill Rogers (301) 229-4381 eves.

HP-14, newly refinished, excellent condition. Instruments, trailer. No collect calls. (305) 238-2761 after 6 p.m.

HP-14. Trailer, radio, oxygen, instruments. Built by A&P. 280 hrs. $5000. John Bourland, (214) 234-8758.

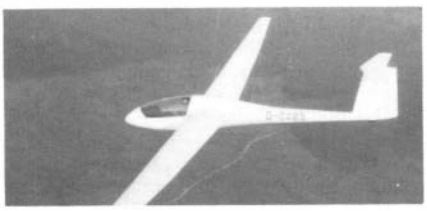
HP-16 kit. One wing and all control surfaces built by A&E. Rest of kit complete. $4000. (501) 735-1346.



CALLING ALL Walter Mittys! The 13.6-meter Salto is the first and only high-performance fiberglass sailplane FAA ATC'd in the Aerobatic Category. Early deliveries. Graham Thomson Ltd., 3200 Airport Avenue, Santa Monica, California 90405. (213) 398-4714.

IMMEDIATE DELIVERY from stock. PIK-20, factory trailer, water, with basic instruments. (817) 387-3047.

PIK-20, PROTOTYPE #2. Why wait till 1976? Factory trailer. No instruments. Tail wheel, nose pitot, other factory changes included but not installed. (516) 944-9020 evenings.



STANDARD CIRRUS. Write for brochure and delivery information. The Standard Cirrus placed second through sixth in the '73 Standard Class Nationals. FAA ATC'd with water ballast up to 860 lbs. Rainco, P.O. Box 20944, Phoenix, Arizona 85036.

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With the purchase of a new RADAIR 10s we will GIVE you everything you'll need to complete a first class, reliable radio installation in your sailplane or crew-car.

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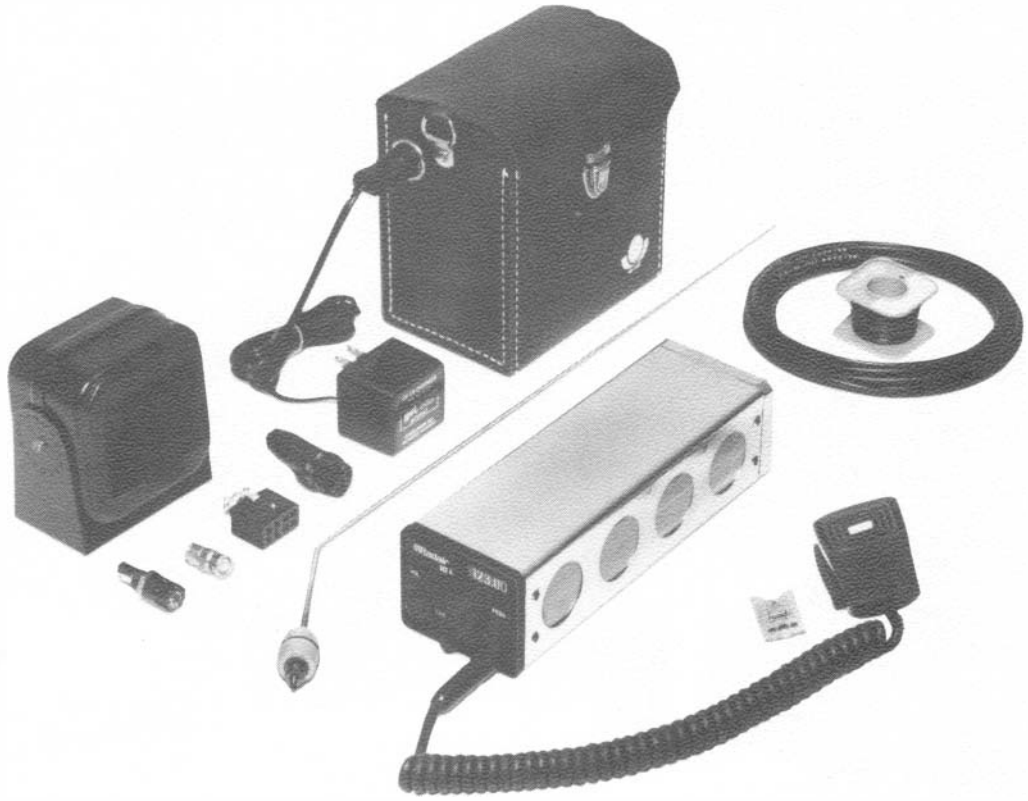

RADAIR 10s, 10-channel VHF transceiver, including eight standard frequencies; 121.5, 121.7, 121.8, 121.9, 122.6, 122.8, 122.9, 123.0 mHz, plus mounting hardware, connector, and one-year factory warranty . . .	$389.00
Crystals for sailplane frequencies 123.3 and 123.5 mHz installed	20.00
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Some pilots have said that we over-build our sailplanes. Perhaps we do. That could be one of the reasons we continue to receive calls for TG-2 and TG-3 service information–more than 30 years after production ceased! By these standards, we will be getting calls well past the year 2001 from clubs and individuals requesting service and data on the 1–34. It's a mind boggling thought, isn't it?

Not really, if you analyze it. The 1–34 is built for service, as well as top pilot enjoyment and satisfaction. Good performance combined with rugged reliability for great soaring fun in every section of the country under all conditions.

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