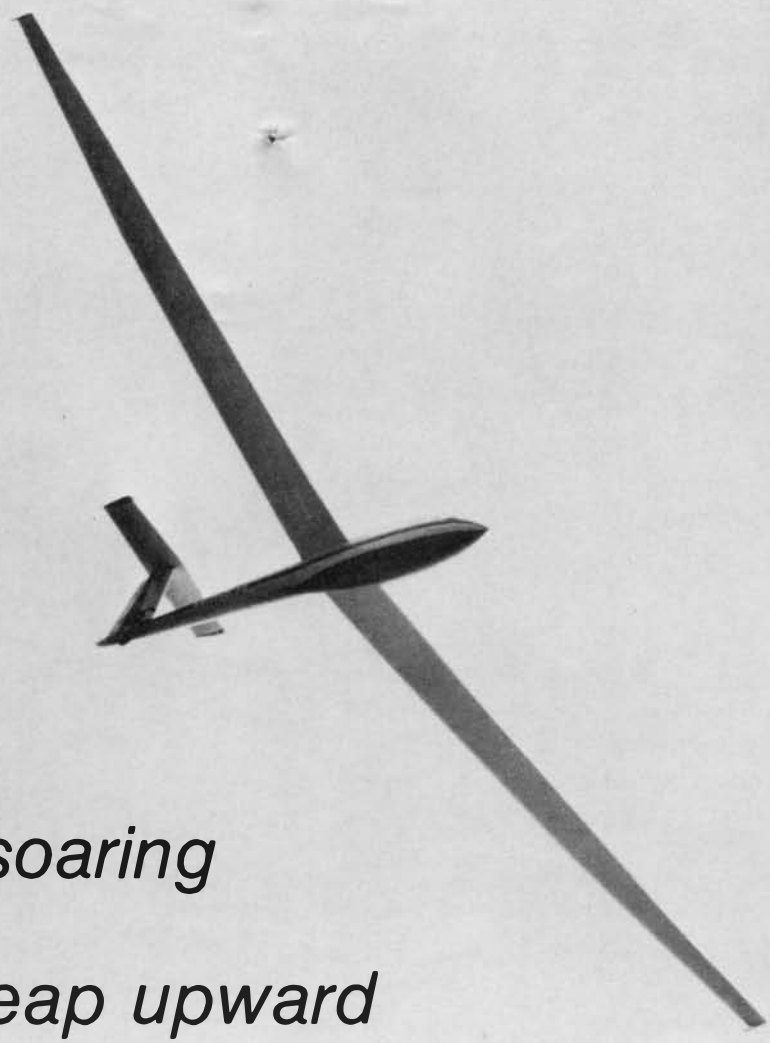
SOARING

JUNE 1980 $1.25



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SOARING & MOTORGLIDING

The JOURNAL of the SOARING SOCIETY of AMERICA **Volume 44 • Number 6 • June 1980**

Dick Brown, Centre Daily Times

See page 16.

The Soaring Society of America is a nonprofit organization of enthusiasts who seek to foster and promote all phases of gliding and soaring on a national and international basis. The Society is also a division of the National Aeronautic Association (The U.S. national aero club) which represents the U.S. in the Federation Aeronautique Internationale (FAI, the world sport aviation governing body comprised of national aero clubs). NAA has delegated to the SSA the supervision of FAI-related soaring activities such as record attempts, competition sanctions, issuance of FAI Badges, and the selection of a U.S. team for the biennial World Gliding Championships. SOARING is the Society's official journal.

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Cover: Summer's here — let's go race cross-country! Chris Woods' extraordinary launch-grid photo should quicken the pulse of sporting types everywhere. — Photograph by Aero Meridian Productions, Scottsdale, Arizona.

Total paid circulation of the May issue was 19,100

"Soaring Mail" may include letters from members who are advocating or opposing changes in SSA policy or operations. In this respect, *SOARING* **strives to serve as an open forum and publish as representative a sampling of all views as space permits.**

But publication of a letter can only give an idea exposure, not implementation. Society bylaws delegate policy and decision-making to the SSA Board of Directors (The SSA Regional Directors) and, between meetings, its Executive Committee.

Correspondents who want action should contact their SSA Regional Directoror the Executive Committee (Names and addresses of Regional Directors are in the *SSA Membership Roster,* **and the names of the three Executive Committee members are given at the close of the Executive Director's Report which is published in** *SOARING* **following each Directors' Meeting.)**

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FULL MEMBER	$ 23
Two-year membership	42
ASSOCIATE MEMBER	14
STUDENT MEMBER	10
FAMILY MEMBER	7
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SOARING MAIL

For Lower Costs — Organize a Syndicate

As inflationary pressures keep pushing the costs of everything — including soaring — higher and higher, it might be worthwhile taking a look at what enthusiasts in the rest of the world have done through "syndicates," and then adapting it for U.S. uses. Here at Caddo Mills in Texas, we have organized two, one around a 1-35C and the other with two 1-26's. I've belonged to the 1-35C syndicate for more than two years, and it works extremely well for me since I can't afford my own glider at this time. I've averaged 90 hours per year for a total of 180 hours in two seasons. Here's how we do it:

One person in each group purchases a glider and then leases it back to the commercial operator (Southwest Soaring). The tax advantages of this are obvious, and the operator handles all matters relating to insurance, repairs, licenses, and hangar fees. He can also rent the glider when it is not being used by a syndicate member. A syndicate of ten people seems to be a realistic maximum. Here's how we do it in the 1-35C syndicate:

a. Initial fee of $175 nonrefundable;
b. Monthly fee of $50;
c. Unlimited flying time during weekdays on a scheduled basis;
d. Two-hour blocks of time scheduled on weekend days and holidays;
e. Each person pays his or her own tow fees and is liable for damage not covered by the basic hull and liability insurance.

I figured it cost me $7.36 per hour to fly 180 hours over the last two years. (Not included are $8.50 tows to 2000 feet at Caddo Mills.) If I had rented a 1-35C at the commercial rate of $21.00 per hour, I would have spent an additional $2416 above my $1373 cost. And, of course, the more I take advantage of the syndicate plan by flying more often and longer (remember, flight time is "free"), the less the per hour cost (though the overall cost increases, naturally). In a syndicate anyone planning to fly at least a few hours each month would break even.

I want to close by commenting on operators Mary and A.C. Williams' fantastic operation at Southwest Soaring. Their encouragement, hospitality, and support make the syndicate program work.

W. E. MAY

Dallas, Texas

Lower the Cost of Soaring — Share.

The wishful dream of low-cost soaring reappears in *Soaring* with tide-like regularity. A letter writer (*Soaring*, April '80) suggests the use of primary gliders. . . . I instructed in primary gliders. It is a masochistic undertaking — and the cost difference is insignificant. Governmental or philanthropic subsidy is not low-cost soaring because the tab is picked up either by the taxpayer or the donor.

The only possible cost reduction is through better utilization of already existing equipment. Logbooks of many privately-owned sailplanes reveal that many fly no more than 60 to 100 hours a year on perhaps 20 occasions.

Perhaps the time has arrived when we should all share a little bit. We should spread the "joy of soaring" to many who have never even heard of it. Then we will be able to lower the cost of soaring.

ELEMER KATINSZKY

Los Angeles, California

Flapping-Wing Flight Get-Together

Flapping-wing flight fans (ornithoptists) have got to get our act together. The problem is that we are far apart geographically and communication is difficult. I have corresponded with about 200 people and know there are other SSA'ers who are interested, but most of us have never met each other.

Now we have a chance: On Sunday, August 3, at 10:30 a.m. in Tent 3 of the EAA Convention at Oshkosh, Wisconsin, we have reserved a time to talk about flapping-wing flight. This begins a most memorable week, one that will be worth coming to from Timbuktu! The floor is yours, if you want it; just write to me and say you're coming. If you can't make it, forward your news and views and I'll pass them on to the group.

WALTER H. CARNAHAN
191 Island Cottage Road
Rochester, New York 14612

Bugs and Polars

George Moffat's April column gave an excellent "user's flight-test evaluation" in qualitative and comparative terms. His testing was in the real world of contest climbs and interthermal cruises with "light-to-moderate" accumulations of real bugs splattered upon the sailplane leading edges.

The light-to-moderate bug accumulation is unnecessarily vague to make any very meaningful comparisons with our DGA flight test data. Here we test with wing leading edges completely clean and separately with 20 tape-simulated bugs per meter of span along the wing leading edge. How many bugs per meter are "light-to-moderate"?

I suggest that pilots occasionally take time to count the number of bug impacts per unit span at the end of a flight so that they will have a more quantitative evaluation of their sailplane performance comparisons. Remember, some sailplanes are much more sensitive to leading edge roughness than others, the AS-W 20 being one of the more affected, according to our tests.

The count can be easily accomplished. Since a meter is close to 40 inches long, 20 bugs per meter places the bugs at approximately two-inch intervals. Count the bugs over a 10-inch span, multiply by 4, and you have your bugs/meter count. The bug accumulations usually accrue linearly with flight time, so one can estimate his or her bug count at an earlier part of the flight simply by ratioing the flight times.

During the last world championships in France we acquired extremely heavy bug accumulations during almost every flight. Counts of 200/meter were not unusual at the end of a 5 or 6-hour flight. Many sailplanes, including my *Jantar 2B*, were severely affected in performance by the effects of leading-edge roughening.

DICK JOHNSON

Dallas, Texas

"Soaring" the *Quickie*

I've never soared a sailplane, but recently I used my homebuilt *Quickie* for that purpose here in Canada. I was flying down Fraser Valley when I spotted some hang glider types soaring down a ridge near Mission. That was nothing unusual except that two of them were higher than I was. I got to thinking that if they could get higher than I was with no power, then surely I could maintain altitude on very little. So I positioned myself above the ridge and kept reducing power until I was just maintaining altitude at 2100 rpm and 75 mph. The engine was just loafing and everything was sure quiet and smooth. I played around for about an hour before I powered up and flew on home for dinner.

I've been back a number of times since. I never realized soaring could be so much fun. I estimate the *Quickie* uses about ¼ Imperial gallon per hour and the engine doesn't seem to mind this treatment at all.

GARRY LEGARE

Surrey, Canada

Blanik Elevator Cable Hang-Up

Recently I had an experience in a *Blanik* which I think might deserve mention as a safety item.

A student of mine who had made two successful crosswind landings was a little late on his flare for the third as we touched down fairly hard, but no harder than on many other landings I have made. We were towed off again, and at about 100 feet, the student asked, "Are you on the controls?" I told him I wasn't and he said, "It sure feels stiff."

I took over and found the stick moved easily from left to right, but was very stiff fore-and-aft and felt "gritty." I released as soon as I could safely do so and got back to the field with very shallow banks, almost no pitch change, and using the trim tab — which operated in reverse. The final flare was accomplished by pushing forward on the trim.

As I touched down, the stiffness in the stick disappeared and was almost normal when I had come to a stop.

An inspection finally revealed that on the last hard landing one of the elevator cables had come off its pulley and was lying next to the main gear. After lift-off, the unloaded shock piston forced the gear to its fully extended position which pinched the elevator cable! Had I understood the problem I could have raised the gear in flight to its up position and solved the difficulty.

PHIL PETMECKY

Houston, Texas

Recycled Cirrus

Old sailplanes, like old soldiers, never die. In fact here in Bordertown, South Australia, they don't even fade away. An abrupt meeting between the earth and an Open *Cirrus* hastened the aging of the old bird rather rapidly. But instead of consigning it to the graveyard, it has been put together and displayed at Tocumwal, NSW (Ingo Renner's town), in the Town Centre. Some plastic (you'll pardon the term) surgery has been used in the reconstruction: The wings and fuselage are original, the nose is PIK-20, and the canopy I.S.-29. Regards from the Bordertown Gliding Club.

KEITH WILLIS

Wolseley, South Australia

Using the BSM in Real Life

I would like to take this opportunity to report on a recent wave flight during which the Benign Spiral Mode ("Safety Corner," November '79) proved itself a very reasonable descent method.

During an afternoon cross-country wave flight along Bald Eagle Ridge in Pennsylvania, I noticed the cloud window was rapidly closing beneath me. At first I was not too concerned; the window had been closing and reopening locally during the entire flight (which served to keep me lost from the time I made my turn-around somewhere south of Bedford until I finally came down out of the clouds). I decided to pick up some altitude over a still well-defined hole and see how things looked to the north. Not good. The wave cloud was solid—an indication of strong lift, but there were no visible openings at its base. A quick glance down revealed a wisp forming in the middle of the window. Also not good. Full dive-brakes, full crossed controls, my 1-26 plummeted to earth.

Taking complete advantage of this respite, I dug out my slightly decomposed and ill-folded sectional. One minute of careful observation (nothing to be seen but trees) and 30 seconds of deduction (fold map in quarters, close eyes, point) put me somewhere between Altoona and Williamsport, give or take umpteen miles.

By the time I had descended to the base of the wave cloud my window had become a rapidly-closing escape hatch. As I entered this pocket, perhaps a quarter mile long and several hundred feet wide, a cloud exploded around me. Two seconds later the ground had disappeared; another second was required to mask out the sun. A spin was out of the question. The thought of entering a spin in cloud was displeasing enough, but add the turbulence and one finds too great a likelihood of finding a spiral dive instead. And the alternative? I had practiced the BSM in the clear several times. It had worked then. As a gesture I centered the yaw string, then let go of everything except the dive-brake handle. The speed settled out to around 50 mph, never going faster than 60 or slower than 40. The only adverse effects noted during the descent were several chilly spasms down my neck and back as I considered all of the nasty things that could happen. Two minutes after getting shut in, I fell out of the bottom, well above the valley, in a bank of 30 degrees. I flew the 20 miles back to Ridge Soaring in the thousand-up, thousand-down roller coaster ridge lift.

All told, it proved to be a very exciting day for the four of us who flew. Tom Knauff had the high point of the day with 13,700 feet MSL after a low notch at 1600 feet. Bob McLaughlin found his elusive Gold Altitude, and Rob Tawse wound up flying his 1-26 close to 300km just to explore the wave. And as for me, besides a spectacular flight, I was brought to the opinion that there is only one way to come down through the cloud, even if it goes clear to the deck. The BSM really works.

CHRISTOPHER O'CALLAGHAN

Baltimore, Maryland

Thermal Generator Progress Report

The soaring cost of soaring is going out of sight right through the atmosphere and into space. Getting airborne in a sailplane behind a power plane may be a treat of the past if inflation and tight money keep climbing, and that leaves you on the ground.

A few years ago Art Anderson and I, mostly at his urging, began designing and building something to get us to cloudbase for a tenth of the cost of an aerotow. We figured if a parking lot, or a rooftop, or a plowed field could generate a thermal, then a man-made generator could be made better. We did some thermodynamic calculations and decided to construct some sort of device which would act similarly but more efficiently than a parking lot after a winch tow. From a number of impractical attempts, we found how to make 4 x 10-foot panels of black plastic and a wood frame, and how to mount the panels for a prototype test. We also found with RC model gliders that there was thermal action over a small number of panels. Now we are in the slow process of building several hundred more panels for a sailplane test.

The only problems we have are time and money. We need volunteers to build panels and buy 1 x 3-inch strapping. We have all the required plastic, the support wires, and stakes. With ten people and a work weekend, we could have a thermal generator. The prototype might not withstand the weather for a long time, but it could prove the feasibility of beating inflation. Each panel costs about ten dollars (or did last year — maybe twelve dollars now). Hey you guys who are on a tight budget, how about joining this effort? A few bucks now might mean the survival of your sport!

PEM DRINKER
25 Strawberry Hill Street
Dover, Massachusetts

★*Pem reports receiving about $40.00 from SSA'ers interested in the thermal generator project. He says he, Art Anderson, and Dave Angetta have spent about $300 of their own money so far and intend to keep building panels for one or two acres — or until they get frustrated.*
— Ed.

More on Calibrating Total-Energy Probes

Eric Greenwell's and Rudy Allemann's "Maintenance and Projects," (*Soaring*, April 1980) interested me because long before Bill Wells' 1977 article on using a car to calibrate total energy probes, I had used this method trying to develop a forward-projecting T.E. probe. At this time I studied the then-new Braunschweig tube. I submitted an article to *Soaring*, but it was never used due to some questions by the SSA Technical Board about my method of hooking up the airspeed indicator.

What I did was to put a tee in the line from the pitot tube to the ASI and another tee in the line from the probe to the same ASI. I simply covered the open end of either tee to actuate the hose of interest, and by switching back and forth with my thumb while watching the ASI, I could tell if the pitot pressure was the same as the probe suction. The lines were, of course, hooked up to the ASI to give pressure on the P fitting for the pitot, and suction on the S fitting for the probe, both showing a positive indication on the ASI. So long as the car was at constant speed, I assumed the static pressure in the car was constant for each switch-test comparison.

While I couldn't make my idea for a forward-looking probe work, I did discover something about the Braunschweig tube. The probe was seriously affected by being tilted. I concluded at the time that an upward-sticking Braunschweig tube would be distorted by the angle of attack change due to pull-up, while a downward-sticking Braunschweig tube, such as the one sold by Cambridge, would be little affected. In other words, tilting the probe into the wind a little didn't hurt the indication, but tilting it backward was very effective in reducing the suction. I have since adjusted my Braunschweig tubes by bending them in the desired direction so that they are never tilted aft in relation to the wind, and it seems to help overcompensation in pull-up.

My forward-looking probe was to be a sphere with a slit around it somewhat aft of the "equator." It didn't work for me anyhow.

If anyone is interested in my report, I could have it copied and would charge only the cost of copying and postage. It was about eight pages.

STEPHEN DU PONT
1049 N. Casey Key Road
Osprey, Florida 33559

The Eaglet — Self-launched or Not?

In "L'Aiglon" (*Soaring*, March '80), it is mentioned that the engine of Bob Peterson's *Eaglet* is not installed. The short article on Bruce Shannon's *Eaglet* tells of his own attempts to solve the engine and propeller problems while mentioning that Larry Haig, the sailplane's designer, has stopped work on the prop. The article immediately following that one tells that Mr. Haig has been designing a new airplane. On page 55 of the same issue there is a display advertisement proclaiming the *Eaglet* to be a self-launching sailplane! ("How long have you been waiting . . . for freedom from towlines?")

The king has no clothes on! The *Eaglet* is not a self-launching sailplane until the engine and propeller problems are solved. Until this happens, I think the AmEagle Company should withdraw their ad from *Soaring*.

ELMER B. LAMMON

Tampa, Florida

★*I must take exception to reader Lammon's comments for the following reasons:*

1. *The AMERICAN EAGLET is and has been a self-launching sailplane since June 26, 1976, when the first self-launch flight was made. Since that time, the original prototype has made over 60 self-launches and the second prototype over 200, when we stopped counting in 1978. In fact, the second prototype was not even equipped with a towhook for the first 18 months of its life, and a hook was only added when it became necessary to tow to 10,000 feet for George Worthington's flight tests.*
2. *Mr. Petersen's decision not to equip his EAGLET with an engine was his alone. The EAGLET is designed to be either a self-launching sailplane or a pure sailplane; the choice being the builder's. To date, out of nearly 300 complete kits delivered, about 6 builders have opted to ignore the self-launch feature.*
3. *The propeller problem referred to by Mr. Shannon was my extended attempt to develop an injection-molded nylon propeller. This concept had tremendous cost and efficiency advantages, but material technology ultimately deemed it unworkable — or at least after $20,000 worth of tooling and 3 years of effort, I am not willing to pursue it further. That decision was made in September 1979, and it is what Mr. Shannon alluded to in the "Homebuilder News" item. I most explicitly did not stop work on the propeller but simply reverted back to the more expensive wood design that had served us well during the period spent developing the nylon prop. The wood prop passed its last durability tests in early December and was released for production in January 1980. Jerry Ritz of Ritz Model Propeller fame is the production source, and although he originally promised delivery in two weeks, he has not yet made any deliveries as of the date of this letter. What would reader Lammon have us do beyond this?*

It is now and always has been the basic policy of AmEagle Corp. to provide a sailplane of reasonable performance at a reasonable price but without compromise in the safety, integrity, or quality of the product. Since we do not have the resources of a General Motors at our disposal, meeting these goals has been a very time-consuming process, and progress has not always been as fast as we would have liked it to be. Interestingly though, our customers have been unanimous in their support of this approach and have repeatedly stated their approval of our decision.

Contrary to Mr. Lammon's opinion, the King is fully clothed; the nakedness is in the eye of the beholder. — LARRY HAIG.

Touring Down Under

After participating in SSA's New Zealand-Australian Tour last winter, I wanted to share my visit with other soaring enthusiasts who might be interested in what things are like for us soaring pilots down under.

When we arrived in New Zealand, our tour commenced with a dinner attended by seven Kiwis, including Ian Pryde, president of the Auckland Soaring Club, and Bruce Drake, co-holder of the world distance-to-a-goal record. Ian Pryde talked about the operation of the Auckland Club. We found it interesting that it sponsors numerous fund-raising events during the year — raffles, dinner dances, auctions, etc. With a club of 250 members strong, they can get support to raise funds from outside the club.

The weather in New Zealand was unsoarable, so we had to wait three days to fly until we got to Narromine in Australia.

We were impressed with the modern motel facilities and the wide range of ships available. I flew the *Janus* and the *Astir CS*, and was scheduled for the *Cirrus 25* (on the only unflyable day as it turned out). I flew the *Libelle 301* and the *Mosquito* on subsequent days and attempted a 200km triangle in the *Janus* with my wife Mary. We got cut down by high cirrus 40 miles out on course, but the incredible number of good landing sites made it easy for air retrieve.

Of us 13 Yanks at Narromine that week, one earned his Silver Badge and another made a 4-hour 38-minute flight, just slipping in ahead of a frontal system that made flying impossible.

Flying conditions were similar to El Mirage in California during early July — weak but flyable. Some days were better than others, but none was strong. We regretfully left Narromine and after a short visit to Adelaide on a barely flyable day, departed for Waikerie.

The Waikerie site is delightful; gliders are flown off grass strips adjacent to the paved runways. It was 7:00 p.m. by the time I got checked out in the club's *Twin Astir*, so due to my flight departure, I had to resort to hangar flying at the clubhouse. They have great facilities — dorms, motel rooms, bar, restaurant; it was really first class. I was impressed with how they have things organized for visitors: cross-country courses with 2-place ships, instructor supervised, then graduating to single-place with Silver, Gold, or Diamond Distance goals — all within a 5-day span!

Like all good things, the tour eventually had to come to an end. But I am left with memories of good times, good people, and good flying.

RAY WILLIAMS
Woodland Hills, California

Let's Keep It Straight

The mail service around here is somewhat slower than ye olde Pony Express, so I didn't get my March *Soaring* until early April. But I found "Tasso's Tale" very interesting and the original photos absolutely priceless. It is important to know about these events of yesterday, because yesterday is what made us what we are today. Knowing about it cannot help but help us understand and appreciate today better.

A little snag though: the prize money is most unlikely to have been so many dollars. Let's see now — Germany in 1934 was using reichsmarks. Also the mountain heights were unlikely to have been given in feet.

History is valuable, but it is important to stick to accurate details, otherwise we distort its meaning.

BILL BUDACHS
Canadian Aviation
Historical Society
Toronto, Canada

★*Tasso says the dollar figures for the prizes accurately reflect the purchasing power of the reichsmarks at the time. The height of the mountains mentioned in the story in feet are also given in meters on Don Forsythe's cartoon/map — Ed.*

Low-Cost 1-26 Contest

An entirely new concept in sailplane contests will be tried out at Aero Country Airport near McKinney, Texas, this summer. A series of six 1-26 mini-meet (Friday through Monday) contests, to be conducted at three to four-week intervals, will be held between May 23 and September 29. The contests are open to rental, individual, and club pilots. Tasks will be based on entrants' soaring skill levels (completed Gold Badge distance leg, completed Silver Badge distance leg, or novice). Completions should require no more than one hour of cross-country flying and are designed, hopefully, for 100% completion to minimize off-field landings.

A club wishing to participate could bring its 1-26 to the field and leave it there for the four days each month that the contest is in progress. Members could then come out and put in a contest flight. The entire club, sharing a 1-26, can compete.

The idea is to have everyone involved and keep costs low. Conceivably, the only costs could be for one 3000-ft. aerotow, one hour's 1-26 rental, $2.00 entry fee, and film for the entrant's Polaroid or Kodak "Instant" camera. Starting dates are May 23, June 13, July 4, August 1, August 29, and September 26. Anyone sending me a self-addressed stamped envelope will receive a copy of the rules.

TIM FARR
569 Medina Drive
Highland Village, Texas 75067

ANNOUNCING

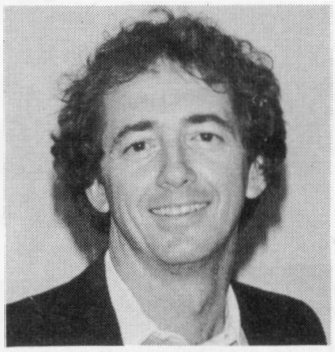
George Worthington's new book entitled In Search of World Records. The highlights of Diamond Badge and world record "tries" in sailplanes, plus an intimate glimpse into the successful attainment of eight official, certified world records in ultralights. Only one pilot in the world has soaring records in both sailplanes and ultralights.

To order, send check or money order to Hang Gliding Press, Box 22552-S, San Diego, California 92122. Prices are $9.95 for soft cover and $12.95 for library quality hard cover. Please add an additional $1.50 for mailing and handling. Applicable state taxes will be paid by Hang Gliding Press. This is a very limited edition and will not be available in bookstores.

SSA IN ACTION

A LETTER TO THE MEMBERSHIP

— John Dezzutti, Acting Executive Director.



In recent years your Directors have instructed the Society's Executive Director to increase direct field contact in areas of concern to soaring. To carry out this policy, last month I made visits to Washington, Elmira, Caddo Mills, and Phoenix. I'd like to report to you what I was doing on these trips:

Airspace:

Despite the success in stopping the FAA's controlled visual flight rules, it would be a mistake to think the battle to preserve soaring airspace is forever won. We have learned, for example, that the FAA proposes to establish a Group II Terminal Control Area (TCA) at Phoenix, Arizona. Operation in the proposed TCA would be subject to, among other rules, the requirement to have an operable VOR, TACAN receiver, two-way radio, and a transponder to operate in the TCA. This would severely limit established soaring operations in the area. We were first alerted to this impending rule by SSA'er **Dick Bartsch.** He has done an excellent job working on this. Now that a formal Notice of Proposed Rule Making has been issued, it is time for us all to get into the act. Members affected by this proposal should address their comments by July 6, 1980, (in triplicate) to:

Director, FAA Western Region,
Attention: Chief,
Air Traffic Division,
Docket No. 18805/79 AWE-18,
Federal Aviation Administration,
15000 Aviation Boulevard,
Lawndale, Calif. 90281

Copies of the full NPRM are available to SSA members from the office.

Airports Opened to Sailplanes

As previously reported, the Airport Utilization Committee under **Fritz Compton** has successfully negotiated the reopening of airports closed to sailplanes at Palmer, Alaska, and Naples, Florida. Currently Alamo Soaring at Castorville, Texas, is in the midst of such negotiations. When a successful airport opening is obtained in a particular FAA Region, and the FAA officials make a determination that sailplanes have rights to use an airport, succeeding efforts at other airports in the region become easier to achieve due to the FAA's reorientation and recognition of sailplane rights in the initial case in the Region. Ultimately, this will result in an "avalanche" effect in individual FAA Regions, and the FAA will eventually establish a national policy which will inhibit local special interests from closing public airports to sailplanes on the false premise of "safety." Until this occurs, we must continue to pry each individual airport open, one by one. Call the staff if you encounter such problems at your site.

Motorglider Study

The SSA has received approval from the FAA to conduct a study of the feasibility of using motorgliders for glider pilot flight training. Under the terms of the "Grant of Exemption," motorgliders, which in the U.S. are presently licensed in the "Experimental" category, will be utilized for flight instruction purposes at two soaring sites until September 30, 1980. The two sites selected are Southwest Soaring at Caddo Mills, Texas, under the supervision of **A. C. Williams,** and the Schweizer Soaring School at Elmira, New York, with **Jim Short** serving as the site manager. Motorgliders are currently stationed at both sites. **Derek Piggott** and **Bernie Carris,** respectively, will be serving as the chief instructors at the two sites. We are quite enthusiastic about this study. If your travel plans take you near one of these sites, check with them to see if you can participate in this study as a student.

Flight Instructor's Clinic

As reported previously, the SSA has received approval from the FAA to conduct a Flight Instructor Revalidation Clinic. Through their participation in this twenty-four hour course, flight instructors may have their instructor's rating revalidated for an additional two years. Thirty-three SSA members completed the first clinic, which was conducted at the Seattle Convention. Negotiations are continuing with the FAA to make modifications to further improve the quality of this course.

AMERICAN MOTORGLIDER ASSOCIATION FORMING

Following the resignation of **Harry Perl** as SSA's Motorgliding Committee Chairman, **Don Pollard** was appointed to take over the job. At the Seattle Convention Don presided at a special meeting for SSA'ers who are interested in this activity. The turnout was so much greater than anticipated that he found himself facing a standing-room-only audience.

Don wasted no time in getting things underway, and realizing little time would be available for in-depth discussion, he presented a plan for launching a newsletter and solicited funds for its support. The response was good and the organization, to be known as the American Motorgliding Association, has appointed **Bill Mouton** as editor of its publication and **John Chalmers** (P.O. Box 665, Rancho Santa Fe, California 92067) as its membership chairman. To assist the AMA in getting started, Acting SSA Executive Director **John Dezzutti** has made available the subscriber's cards to the discontinued SSA *Motorgliding* magazine.

GLIDERPORT INNUNDATED

Skylark Gliderport, popular southern California soaring site, disappeared beneath flood waters this past winter, and a climatologist predicts it may be two or three years before it emerges again. Lake Elsinore, next to the field, is a natural catch basin for the watershed areas of high mountain ranges to the north. Normal rainfall in the semiarid region provides enough water for the lake to cover 2700 acres, but after more than double average precipitation, it now covers 6500 acres — including the gliderport where only hangar roof tops were visible after the deluge.

Until its evacuation on February 24, Skylark was home to a parachute training center, commercial gliderport, three soaring clubs, and approximately 40 sailplanes. One-hundred tows per day were not uncommon during busy weekends as pilots sought thermals, flew the Ortega ridge, or utilized the Elsinore smog front.

"We flew tows for the last time on Monday, February 11. The next day it really began to rain," recalled **Arleen Barrett,** commercial operator at the field. She moved her operation to Perris Airport 10 miles northeast on February 24.

As the lake rose 2 inches per hour, ships were hurriedly moved to higher ground. "Everyone worked hard that weekend," Barrett said.

John Stubbs, a veteran 1-26 pilot, remembers the lake's advance. "I moved one trailer, then drew a line in the dirt where it had been parked. I stood and watched as the lake crossed that line."

Arleen notified sailplane owners of the pending evacuation. "I told people to come and get their planes," she said. "But most people just couldn't believe what was happening. I couldn't believe it either.

"One group called me at least six times, asking me about their trailered ship. Each time I told them to get it out right away. When they finally did, it was in water up to its wheels. It took a tractor to move it."

As if the flood weren't enough, Skylark's resident soaring clubs had other weather problems two weeks before Lake Elsinore's rise. Late in January a tornado-like whirlwind swept across the club tiedown line, uprooting the cable and throwing ship against ship.

"We lost a *Blanik,* a 1-26, and two 2-33's," said **Phil Bufford,** Associated Glider Clubs of Southern California member. "We were left with a 1-26 which we moved to Torrey Pines. But we hope to do most of our flying out of Jacumba Airport, east of San Diego."

Mark Denzker, president of the University of California, San Diego, club had a similar story. "We were lucky," he said. "We lost only one ship, a 2-22, but we have another plus a 1-26 and are also flying them out of Jacumba."

Evacuation efforts climaxed on a Sunday when rising waters approached the hangar area. Seven aircraft would have been left behind because of a shortage of trailers. "Seven of our ships had to be airtowed out that day while there was still enough dry land to take off from," Arleen explained. Since the regular runways were submerged, an emergency strip 1000 feet long was graded. A 100-ft. towrope was cut and a 180 Super Cub was used for the last-ditch rescue. There was no room to spare.

"It was exciting," recalled **Richard Ensign,** one of the volunteer pilots who ferried the sailplanes to Perris. "The Super Cub was about five feet above the lake at the end of the strip."

Will Skylark Field someday reappear? **Dr. Robert Pease,** a professor of climatology at the University of California, Riverside, believes it will. Normal evaporation will decrease the lake's level 4.2 feet from June 1 to November 1, he predicts. At that rate, the field should reemerge in two or three years.

"I think this may be an end of an era," Arleen observed.

— DON LANNON

THE CIVV REPORT

As a member of the world sport aviation organization, the FAI (*Fédération Aeronautique Internationale*), the Society sends a delegate to attend meetings of its gliding committee, the CIVV (*Commission Internationale de Vol à Voile*). **Bob Buck** was in Paris this spring to represent the U.S. and to bring the word back on the latest developments among fellow enthusiasts around the world. Here's his report:

1983 World Championships: The CIVV met in Paris on March 28th and 29th, 1980. Highlights of the meeting included the selection of Argentina for the 1983 World Gliding Championships. Bids were presented by Australia and England, but the one of Argentina, with attractive pricing and a very appealing area not far from Cordoba, won the sanction.

Motorgliding: The report of the Motorglider Committee emphasized the growth of motorgliding and the successful championships at Feuerstein, West Germany, last July. There have been sixty-five PIK-20E's delivered, and there are sixty more on order. The number of motorgliders in Europe now exceeds 700.

Club Class Championships: The European Club Class Glider Championships were held in Orebro, Sweden, from June 11th to 26th, 1979, with fifty participants representing eleven countries. **M. Brunecky** of Czechoslovakia was the winner. Although these are called European Championships, the USA was invited; unfortunately, we did not have an entry and were missed.

Feminine Championships: The First European Gliding Championships for Women were held in Dunaujvaros, Hungary. Although only 25 women competed, the flying was of high caliber. The next championships will be in 1981 in France. It is hoped the USA will be represented and regrets were expressed that the USA did not participate at Dunaujvaros.

VFR Rules Changes? There was considerable discussion on VFR rules as the result of a European ICAO effort to change the rules. This is a long project and eventually will be world-wide. FAI has a strong group working for the protection of VFR airspace. The German Aero Club has been able to obtain permission to operate gliders VFR in a large part of the German airspace adjacent to Frankfurt. This is a major breakthrough and demonstrates the value of constant effort by individual countries.

Glider Pilot Licensing: CIVV-prepared glider pilot licensing requirements are to be forwarded to ICAO in Montreal. This effort, suggested by ICAO, will result in world-wide glider pilot licensing having the benefit of the world glider community experience for safe and reasonable requirements. It will not change FAA's present requirements.

1981 World Championship Preparations: Fred Weinholtz reported on the preparations for the World Gliding Championships to be held at Paderborn-Haxterberg, West Germany, May 24-June 6, 1981. The preparations are impressive with each team being loaned five Mercedes-Benz automobiles plus a deluxe trailer for team headquarters, along with other amenities and an efficient organization.

Sporting Code: The final draft of the Sporting Code was approved and will be published in January 1981. This will update all record and badge rules and requirements, glider classifications, and world championships. The changes are not major, but rather a thoughtful improvement of the code that has been developed with experience over a long period of years. **Mr. Tor Johannessen,** the delegate from Norway, deserves large credit for guiding this work to completion.

Lilienthal Medal: There were no names proposed within the proper time for the Lilienthal Medal for 1979.

The president of CIVV, **Bill Ivans** of the USA, was reelected, as were the six vice-presidents and secretary.

The next meeting will be March 27th and 28th, 1981, in Paris.

STATE-RECORD MONTH

August has been declared "State-Record Month" by the SSA office which wants members to become aware of the thrill and adventure of record attempts. Did you know that you can set a state record while flying an FAI Badge leg? (See **Nancy Evans'** item in this section.)

While putting the *1980 Membership Handbook* together, the SSA staff noticed the "sad state of affairs" in the State Records section. Maybe what is needed is some good old-fashioned regional rivalry. If pilots in a neighboring state have made "easy pickin's" records, then drive across state lines and set records for that state. Some hot record rivalry could ensue. You don't have to be a resident of the state in which you set a record, nor do you have to land in the state from which you started or for which you are setting the record.

To sweeten the pot, the SSA has this offer to make: When attempting a state record, and while filling out the paper work, fill out a State-Record Month form (available from the SSA office, Regional Director, or SSA State Governor), have it signed by your official observer, and send it into the SSA office. The only requirement is that you have to make a bona fide record attempt during the month of August. One name will be drawn from each SSA Region for a $10 SSA merchandise gift certificate. All names received will then be put together and a name drawn for the grand prize: a new LC-2 digital quartz chronometer.

If you need forms contact the SSA office; if you need information contact your SSA State Governor or State Record Keeper. — JOHN LEE

GILMER TO LEAD VACATION DERBY

The Soaring Society of America is happy to announce that **Carson Gilmer** of San Antonio, Texas, will be acting as "lead" pilot for the 3rd Annual SSA Vacation Derby, July 5-12. Carson, who holds his Diamond Goal and Diamond Distance legs, is well-traveled in the area that the Derby will cover.

Last year the San Antonio pilot stayed busy flying the National Standard Class Soaring Championships, taking 23rd place in a field of 66. He also placed 33rd in a field of 58 at the 15-Meter National Championships at Adrian. Gilmer's best day at the Standard Class contest was a fourth place and at Adrian a second place. Acting as "lead" pilot, Gilmer will be of enormous help to participants by answering questions, offering assistance, and showing the way. This will not only be true on the ground, but in the air as much as possible. The Derby is not a competition, but a fun learning-and-sharing event.

The first Derby registration came from **Ruth Stevens** of Denver, Colorado, with **Tom Stevens** signed as second pilot. The second registration came from **Tom Heywood**, of T/H Enterprises, in Houston, Texas, who will be bringing a two-place *Lark* and several of his instructors. Heywood is also thinking of bringing additional ships and has signed **Jennifer Heywood** on as second pilot.

The Derby is more than just flying. It is beautiful San Antonio, Corpus Christi, Texas food, and especially Texas hospitality. If you are interested and wish more information contact the SSA office. — JOHN LEE

HOMEBUILDERS WORKSHOP LEADERS ANNOUNCED

Although the Labor Day weekend is still several months away, interest in the SSA Homebuilders Workshop has been high with more than a dozen "hard-core" types already registered by mid-April. Benefit of preregistration is a savings on the registration fee, and most are registering their wives this year so that they can sit in on the various sessions.

It has been confirmed that **John Monnett** will be attending with his *Monerai* and **Larry Haig** will be coming to Elmira with his *Minibat*. "We had a pretty good turnout for the first workshop and feel confident that it will grow with enthusiasm every year. Thanks for your invitation," Haig wrote.

"When I saw the announcement in *Soaring*, I was hopeful of being asked to present woodworking sessions again. Yes, I would be most pleased to participate in the second workshop," commented **Leonard McClain,** who presented a marvelous talk illustrated with beautiful watercolors last year. McClain has built several *Cherokees*.

Also returning to share their knowledge will be **Jack Greene,** talking on composites and fiberglass; **S.O. Jenko,** touching on some different aspects of wood construction; and (hopefully) **Al Backstrom,** designer/builder of the *Flying Planks*. An expanded panel discussion is being arranged for Sunday afternoon, and a new session by **Al Backstrom** on the fine points of getting your ship inspected and registered with the FAA is scheduled for Saturday.

Several other new sessions are being arranged at this time with Friday afternoon and evening shaping up into a relaxed program that will be of interest to the entire family. **Paul A. Schweizer,** Chief Executive Officer, Schweizer Aircraft Corporation, Elmira, will present a talk at 2:30 p.m. Friday on "How Homebuilding Developed into Schweizer Aircraft Corporation." Schweizer will again open its doors to workshop participants Monday morning at 10 a.m. "We will have special jobs set up to show the different aircraft manufacturing methods we use and expect by that time we will have the 1-36 in production to show them," Schweizer wrote.

There will be plenty to see and learn for both first-time and second-time participants. When sending in his registration **Norman R. Corwin** wrote, "The last workshop was strictly great; see you on Harris Hill Labor Day weekend."

Come renew friendships from last year's event, meet new enthusiasts, ask questions, and share the National Soaring Museum's hospitality and good food. If you haven't received a registration brochure, contact the SSA office. — JOHN LEE

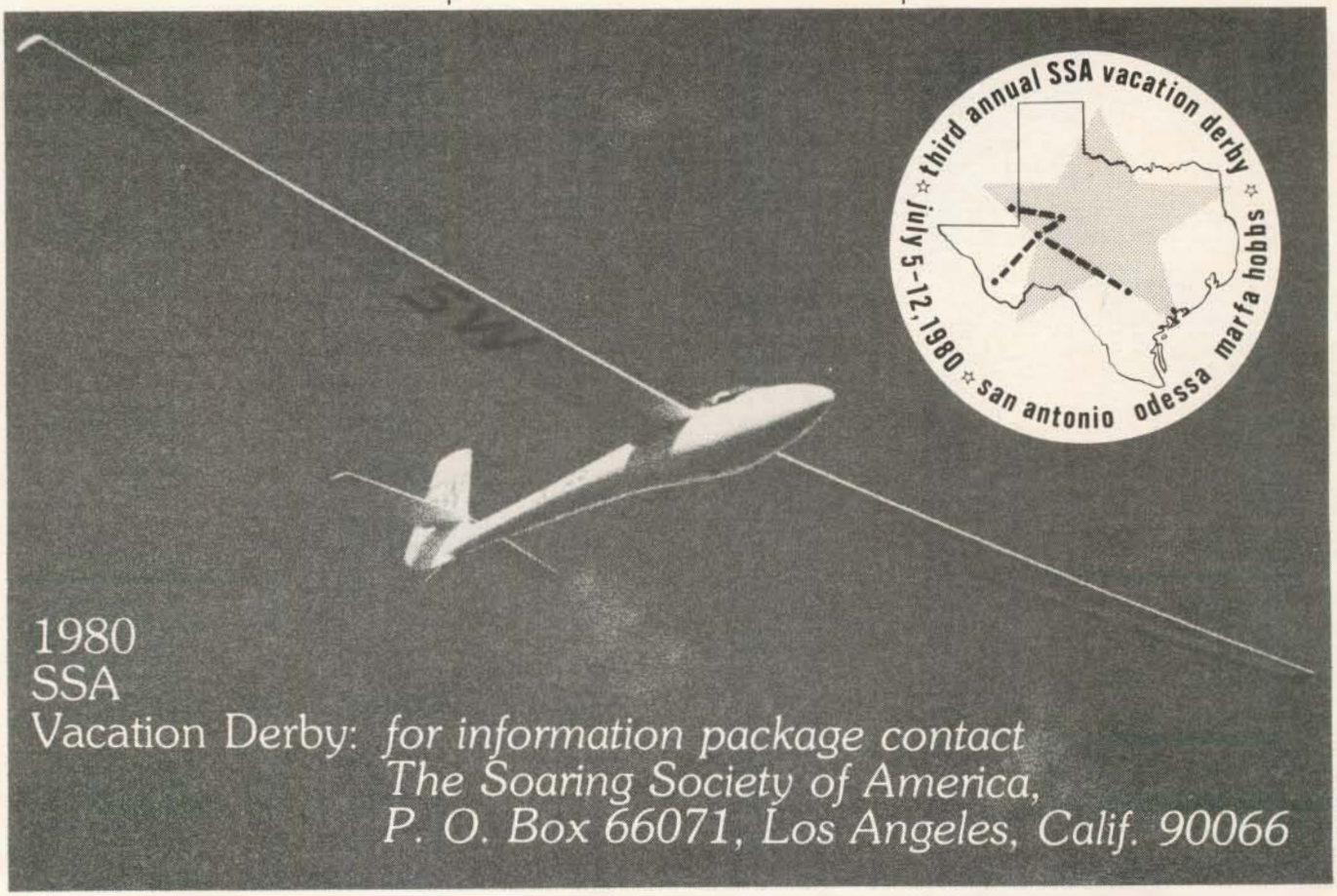
1980 CONTEST SCORING

The SSA office can assist contest scorers during the season by loaning *Scoring Handbooks* for use with the T.I. 59 and T.I. SR-52 hand-held programmable calculators. These handbooks have been updated to reflect the scoring changes for the 1980 National and Regional Contest Rules.

The *Scoring Handbook* includes program descriptions, user instructions, preprogrammed magnetic cards, and programming instructions for blank magnetic cards. Contest managers are encouraged to contact the SSA office to request a copy for their use. To ensure the return of the handbooks, a twenty-five dollar refundable deposit must accompany your request.

These handbooks are available due to the hours of work and dedication of **Robert V. McNeill,** SSA Governor for East Texas. We thank you Bob for this outstanding package!

— CINDY BRICKNER



STOP AVIATION'S GROWTH?

You don't often see editorials in *Soaring;* it is a privilege the present Publications Board Chairman seldom chooses to use. However, there appears a straw in the wind which could easily be missed if not set out for all to consider. I refer to recent testimony before House aviation subcommittees by the Federal Aviation Administrator, Langhorne M. Bond, and the Secretary of Transportation, Neil E. Goldschmidt, and, additionally, a talk by Bond to the New York Society of Security Analysts.

A fundamental change in the federal government's handling of aviation has been exposed as a strong possibility under their guidance. Consider the two following sentences excerpted from statements of these men:

- Bond: "It is becoming more and more doubtful — given the constant erosion of inflation — that we will be able to meet the demands of aviation over the next decade."
- Goldschmidt: "In the future, rather than build to *accommodate demand*, we would, if required, exercise our authority to *control demand* in a manner consistent with system safety and capacity." [Italics added for editorial emphasis.]

One suspects they may be reacting to last year's withdrawal of the NPRM attempt to lower positive control floors, and the resultant slowdown in new and expanded TCA implementation. We might surmise this also represents FAA's recognition that its present system could not begin to handle the existing traffic even if it were all transponder equipped. Every day many, many pilots who request VFR radar traffic following are denied it because the controller is "too busy" and/or the scope is near saturation. The bureaucracy seems bereft of the capacity to manage its future.

In its defense, however, we acknowledge that strong pressure exists from the Office of Management and Budget and some academics to hold down federal expenditures by limiting funding for productivity-related projects (like aviation) in order to move more resources into social programs. Nevertheless, one must be concerned that those with the highest responsibility for aviation may have given up the fight.

It is a complex problem to resolve all the pressure from the diverse viewpoints when environmental considerations vie with economics, when business travelers vie with vacationers, or when 747's mix with 1-26's. But an airliner full of vacationers can't convince the commercial gliderport operator that his livelihood is any the less important than their vacation.

Obviously airport capacity will be used even more to limit traffic. The numbers of such limited-use airports will rise. New traffic-reliever runway construction has, for all practical purposes, ceased, because the four billion dollars of ADAPT funds remain unspent. No reliever airports are being built. Airspace has been equally artificially limited in capacity by Positive Control Airspace and Terminal Control Airspace creation. Their expansion will also inexorably take place. Soaring close in to large population centers will continue to become more difficult. The hoped-for answer to reverse these scenarios — a more sophisticated airspace management system which puts more traffic separation capability into the cockpit — is now being implied to be beyond our economic reach.

Nothing is going to happen overnight, though. The erosion of present airspace's accommodation to traffic will be very slow. But a trend toward a whole new philosophy for aviation has surfaced which could eventually have a major impact upon soaring. The population growth and its attendant pressures *do* result in changes which require adaptation. Are they the changes we want? What should we in soaring be doing?

The purpose of these words has been to alert the Society and *Soaring* readers. No die is yet cast. If you are truly interested, concerned, and want to know more about this subject and its portent, you'll read; you'll talk with others; you'll ask questions of those in government and industry; and you'll formulate your own course of action to attempt to attain your goals.

That is what *I* have begun with this editorial.—BERNALD S. SMITH, Chairman, Publications Board.

1981 SSA CALENDAR

Cameron Walker

The time is here once again to have your talents displayed in the form of an SSA Calendar shot. The only requirement is that the photograph reflect a phase of gliding or soaring. Only 35mm color transparencies will be accepted. Please do not send color prints or color negatives and limit entries to your best ten images, horizontal and vertical. Include a brief description of each entry (subject, location, etc.).

Photographers whose image(s) are selected will be rewarded with a cash or merchandise prize.

Notice of receipt will be acknowledged only if a self-addressed, stamped envelope or postcard is included with your mailing. If material is to be returned, please include a SASE that will prevent damage to entries while in transit. Deadline for entries is July 31st.

Send entries to: 1981 SSA Calendar, P.O. Box 66071, Los Angeles, California 90066. — GEORGE UVEGES, SSA Calendar Manager.

STATE RECORDS

Do you know the soaring records in your state? The *SSA 1980 Membership Handbook* lists the current U.S. State Records on pages 230-237. You will probably find that records in some categories have not yet been set and that others which were set years ago are begging to be bettered. The "paper work" for State Records is not difficult. State Records must comply with the FAI Rules for Badges and National and World Records. The SSA staff is happy to send, free of charge, State Record Rules and State Record Applications upon request.

Before flying for a record, we recommend contacting the State Record Keeper in the state you are planning to fly from (page 3 in the *SSA 1980 Handbook*). Check to see if the existing record has changed. The State Record Keeper will know this information before the SSA office does. The State Record Keeper processes the record and sends notification to the SSA for recording. This process changes when the record is also an FAI Badge flight. If your Badge flights exceed a state mark, why not claim a State Record at the same time? Simply fill out a State Record Application as well as the FAI Application and send the FAI application and barogram to SSA with a note to contact the State Record Keeper when approved. At the same time send the State Record Keeper the completed State Record Application with a note explaining that the SSA will be contacting him or her.

The following rules are most commonly misunderstood or unknown:

1.3: The departure point for the record flight must be within the state. (Note: There is no requirement that the pilot or passenger must be residents of the state.) Take a look at the records of neighboring states. You might be surprised.

1.4: Senior Class. The pilot and passenger (in the Multiplace subclass) must be of an experience level less than Gold Badge. When a Senior Record exceeds an Open Class Record, it will be listed in the Open Class Record list.

1.5: Junior Class. The pilot and passenger (in the Multiplace subclass) must be under 21 years of age. When a Junior Record exceeds a Senior Record and/or an Open Class Record, it will be entered in the Senior (unless applicant is a Gold Badge pilot) and/or Open Class Record list and in the Junior Record list. There are many, many open records in this category.

1.7: In the Feminine Class, there is no Multiplace subclass. Flights may be Single-place or Multiplace; if Multiplace, the passenger must be female. This is another category with few existing records.

1.9: Application for records (other than National or World Records) must be made on the official application form to the local State Record Keeper, within 30 days of the flight, but the Record Keeper must be notified within 10 days after the flight *in writing*. This is very important.

2.14: The triangular courses for speed must measure at least the distance of the record course being flown (100, 200, 300 or 500km) and less than the next longer course length. No side of the triangle may be less than 28 percent of the total course length flown. This rule is important to keep in mind as the FAI Badge Rules accept a less than equal-sided triangle.

The same preparation and care should be taken on flying and claiming State Records as FAI Badge Claims. This includes choosing an observer who understands his job and is willing to take the time to do it. Flying for State Records makes for friendly competition and can be very satisfying for the pilot on any experience level.

State Record Certificates are beautiful. Please feel free to contact the SSA and your State Record Keeper for further information.

— NANCY LEE EVANS

VINTAGE SAILPLANE ASSOCIATION REPORT

*Interest in vintage sailplanes continues to increase. One of the most active members of the Vintage Sailplane Association is its archivist, **Bob Storck**, who has supplied the following report on VSA's current activities.*

In its relatively short history, the Vintage Sailplane Association division of SSA has become known for the historical expertise of it members and has been called upon to respond to public inquiries and provide specialized information to museums. VSA also has contacts with vintage goups in Germany, England, France, Switzerland, Canada, and Australia. The Association publishes a quarterly newsletter, the *Bungee Cord*, filled with articles detailing the past.

The National Air and Space Museum has called on VSA help to sort its glider photographs and other records. VSA members spent some time at the Air and Space Museum storage area in Silver Hill, Maryland, sorting through the gliders stored there. NASM records showed one Horten glider of unknown type in storage; VSA members found and identified three and a half! Through oral history techniques and correspondence, we are capturing the recollections of soaring luminaries such as **Paul** and **Ginny Schweizer, Pop Khrone, Peter Riedel, Ray Parker, Rudy Opitz, Jack Laister, Gus Scheurer,** and **Hanna Reitsch.** Peter Riedel spent several weeks sorting Library of Congress records on prewar German gliding and has promised to share his findings with us.

Plans are underway to sort files at NSM for vintage glider information.

As a result of VSA research, construction drawings on over twenty-five vintage gliders have been located, enhanced, or redrawn when necessary, and microfilm copies donated to NSM and NASM. Both museums find microfilm to be far easier to store and this medium allows excellent reproductions to be made.

VSA is financially supporting this effort by selling construction drawing sets, 3-views, and other items. As a non-profit organization with volunteer workers, all proceeds go toward further archival work. Currently drawings are available for:

Grunau Baby	$45
Goeppingen *Wolf*	$45
Hütter 17	$45
Ross R-3	$45
Backstrom EPB-1 *Plank*	$35
Mead *Rhön Ranger* (primary)	$25

Drawings can also be made available for the Bowlus-DuPont *Falcon*, Laister UG-2P2 (2-place), Westphal *Thermal*, Stan Smith's *City of Utica* (2-place), Waco Primary, *Rhönadler*, *Rhönbussard*, *Weihe*, *Olympia*, Bowlus *Baby Albatross*, Buxton *Transporter* (2-place), Stanley *Nomad*, 1902 *Wright*, 1896 Lilienthal, and 1909 *Popular Mechanics* and Horten designs as well. Many of the sets are sketchy, incomplete, or in poor condition. Others have constraints imposed on them by the party donating them. Others are simply too expensive to reproduce for sale (there are 230+ sheets for the *Weihe!*). We would be happy to discuss these with any interested persons. In most cases, the cost of obtaining a copy would be based on the cost of microfilm duplication.

VSA also has been gathering 3-view drawings of gliders. Initially we were interested only in vintage designs, but since there is no source of other sailplane 3-views, this was extended to all sailplanes. The files now cover over 500 glider designs, as well as some motorgliders and HPA's. An 18" x 24" 3-view is available for $2.50, or five for $10.

Among the records we have access to are the military service, maintenance, and parts manuals for most WWII training gliders. VSA will reproduce these with the price dependent on the number of pages involved.

Another service offered is the appraisal of gliders and items donated to museums. VSA has not charged for this service, but is always pleased with donations to archival efforts.

Membership in VSA costs $8 per year and $10 for family membership.

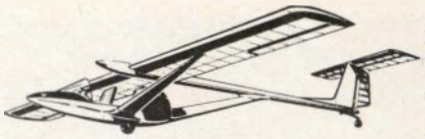
We are anxious to get plans, 3-views, and photos to expand our files. Also, VSA is trying to build a file of soaring related magazines such as *Thermik*, *Sailplane & Gliding*, *Australian Gliding*, *Sport Aviation*, OSTIV publications, and, of course, *Soaring*. With all this, VSA could use some storage files (i.e., drawing tubes or flat files). It is important to emphasize that none of this is intended to detract from the NSM efforts; the intention is to provide support for the museum. All materials passed on to VSA will be copied and sent to NSM or returned as specified.

One other effort VSA is undertaking is a card index covering vintage gliders. We would like information on any pre-1960 designs, active or inactive, whole or even just a few parts, even if the ship is in a museum or out of the country.

We would like as much of the following information as possible: where the ship is (or was) located; name and address of the owner; condition; N number; serial number; significant history; or any other appropriate details. A photo would also be appreciated.

Please address correspondence on these matters to: **Bob Storck**, 6220 Kentland St., Springfield, Virginia 22150.

Any checks should be made out to the Vintage Sailplane Association.



Skrzydlata Polska

On her own — one woman's liberation:

MY 1000 KILOMETER FLIGHT

by DORIS GROVE

High fashion: Bare look or bear look? For Doris the operative word is "high," and though she didn't send a pattern along with her story, she has labeled those stylish elements of her ensemble designed for the exciting winter ambience of an AS-W 19 salon.

Dick Brown, Centre Daily Times

Last December I made three attempts at a 1000-kilometer flight and each time I landed out. To be the first woman to soar 1000 kilometers (621.4 miles), I would have to fly from Ridge Soaring Gliderport at Julian, Pennsylvania, down the Alleghenies to Bluefield, West Virginia, and back, a total distance of 1000.868 kilometers. I would need a lot of ridge lift and anything else I could find.

On the first attempt I landed at Keyser, West Virginia. I picked a good field to land and was aerotowed back.

The second time, I got across the ridge gap at Bedford, Pennsylvania, and partway to Cumberland, Maryland, when I ran into rain. The storm started to close in on me, so I turned around, landed at Bedford Airport, and got another aerotow home.

When I took off on the third attempt for Bluefield, I seemed to be making good time, crossing Altoona Gap, then Bedford Gap, and booming right along until I hit Buffalo Mountain. Then, just like that, the bottom dropped out. The wave suppressed the ridge lift and I had to land. This time, the retrieve was by car.

Late winter and early spring are ridge season along the Alleghenies, and I check the weather day and night. I also keep track of how many hours of daylight there are each day. I can't tell you how many times during December, January, and February I got up at three or four o'clock in the morning to call the Flight Service Station for the weather. Sometimes I came out to the airport to see conditions for myself.

About the second week in February I had a slight setback — I slipped on the runway and had a mild concussion. It knocked me out briefly, and I remained dizzier than usual. I stayed down for a few days nursing my bruised brain, hoping the winds wouldn't blow. For a couple of weeks I didn't fly at all. The third week I flew only with licensed pilots. The next week I started back with student training. I needed all the air time I could get so I would be strong enough to endure my cross-country flight when the time came.

In March, fronts started coming down from

WHAT DOESN'T SHOW:

2 PAIRS WOOL LONG JOHNS
2 WOOL SWEATERS
1 WOOL PANTS
1 WOOL FACE MASK TO COVER NOSE
2 PAIRS WOOL SOCKS

Canada again. During January and February before my fall, Karl Striedieck, who lives a few miles south of Ridge Soaring, had been away much of the time, and it was rumored he was planning a record flight from Pennsylvania to Florida. I was hoping for a super-great day so I could take off for Florida and beat him. Wouldn't that have been something!

Then came March 11, 1980.

I got up at 4:00 a.m. Winds were strong out of the northwest. Just right for lift along the Bald Eagle Ridge. Out my bedroom window I could see stars and clouds that were moving fast.

I hurried to the gliderport, taking my daughter Rosalie along. I told her that instead of going to school she could come along to help me get ready and run my wing if she would like.

When I arrived at the gliderport at about 5:00 a.m., the winds were strong, about 25 knots. I had made up my mind that I wouldn't attempt the flight unless the winds were blowing hard.

The AS-W 19 was assembled. Tom Knauff, my partner in Ridge Soaring, and Rosalie helped me roll the plane in front of the gliderport office. It was still dark, so we put the floodlights on. We put 10 gallons of water and 5 gallons of alcohol in the wings and got the barographs, declaration, cameras, myself, and my gear ready.

It was coming up on 6:00 a.m. All was going well until suddenly everything started going backward. The next 15 minutes turned into 30 minutes. I could have taken off in daylight 15 minutes sooner if I had been better organized. Tom had the towplane ready, but it took time to help me and all my paraphernalia into the sailplane.

Rosalie ran my wing. I towed off at 6:30 a.m., releasing at 6:32 and 1600 feet MSL. The next three minutes were frustrating. I couldn't get the gear up, and I was spending precious energy. I was worried. Would I have the energy and stamina for the flight? I finally got it up, did a 180°, and started south down the ridge toward Maryland and West Virginia.

Passing Karl Striedieck's place I saw his AS-W 20 out, but there was no one in sight.

I bombed down the ridge. It was working fine, though there were snow showers from Tyrone to Altoona, about 50 kilometers out from Ridge Soaring. I got into wave lift at Altoona to 5000 feet and crossed both gaps, Altoona and Bedford.

But Karl took to the air after I passed his place and by the time I reached Cumberland he had caught up. Karl couldn't make it up to the wave, and I couldn't get any higher because the cloud tops were about 5500 feet. More snow, and visibility was bad.

My choice, rather than lose time trying to get above the clouds, was to put the nose down and head for Keyser, West Virginia, a landmark on the ridge about 190 kilometers out. By this time I was thermaling. I pulled up in a big one only to go nose down the other side completely stalled out.

Dick Brown, Centre Daily Times

"Nice goin' Mom!" Son Dave's bussing represents more than filial affection — there's a new awe and admiration there, too. Whistler's mother she ain't.

Karl said the same thing happened to him that day. It really felt funny.

I remained relatively high through the Knobblies where the ridge turns into a group of low hills. Below Keyser it was ridge running and then into wave again. This time Karl got into the wave, too. I went to 13,000 feet, my highest altitude of the flight. This was the same place I flew wave on my 454-mile record flight on April 9, 1979. At that height you have to watch closely so you don't lose sight of the ridge; up so high the ridge becomes small, and there are many running along together.

I didn't see Karl again until 360 kilometers out at Mountain Grove, West Virginia. He radioed the new dam had been filled with water. During most of the flight I hadn't paid much attention to where he was, but when I got down to this area, I saw him very low at the north side of the dam. From 6000 feet it was hard to estimate how low he was, but to me he looked precariously low. I was glad it was Karl and not me. He had always made me aware that I was on my own on our other flights, so I thought, *Karl, you're on your own!*

I had never soared the ridge past Mountain Grove, though I had flown in a Cessna with Tom Knauff and the Ridge Soaring gang. We had landed at the airport, eaten lunch, looked at the Fincastle Country Club, the 1000-kilometer turnpoint, and taken off again. That had been two years earlier and we had been flying higher — so the route ahead was quite unfamiliar.

George Vakkur, who made this same flight in 1977, gave me a copy of a detailed map of the Covington, Virginia, area. He had the useable ridges traced in red ink. On this flight I had this map plus my own ridge map. This was the first time I had used my maps. At Mountain Grove I

took a good look at both of them, especially George's, and decided where I was going. This is a difficult area with no ridge for about 25 kilometers — an area I have studied very much. It paid off.

Onward I went! I was concerned about what had happened to Karl but stayed off the radio in case he was struggling. It really bugs me if I'm low and someone calls me when I need to concentrate. I got through that area with flying colors, and looked back to remember what it would look like going home.

I was on the ridge again. I had never been on this section before. It was incredible — about 110 kilometers of unbroken ridge. I put the nose down — 120 to 130 knots — tightened my shoulder straps, and slid down into my seat to keep my head from hitting the canopy.

Meanwhile, Karl had managed to climb out of his difficulties and was coming again.

About 450 kilometers out I recognized Narrows, Virginia, and the New River. Then I spotted a jog in the ridge called Jesse's Knob, followed by a straight stretch into Bluefield. My thoughts now were, *Gee! I don't have far to go to my turnpoint.*

WRONG!

This ridge went on and on. Finally, I recognized the look-out tower on the ridge right before Bluefield, which is a big town, lying long and narrow in the valley floor. You can't miss it.

I remember Karl radioing, "Here it is!"

"No, my turnpoint is farther down the ridge," I said.

"What's your turnpoint?" Karl asked.

"I'm going down to the other country club," I said.

And I kept bombing away at 120 knots. I loved it!

I realized that I didn't know what Karl was really going to do here, nor did Karl know my turnpoint. I was aware now that Karl wasn't going to Florida; it wasn't good for him farther down south.

I had two barographs and two cameras along. I took my pictures with the first camera, then the second. The cameras were hand-held, because I'm known to be a lousy picture taker with my cameras mounted.

I pressed my mike button and said, *"Doris, get the hell out of here and get home!"*

I put the nose down again, and as the ridge went flying by Karl said, "You sure *must* want to get home."

After this transmission, I couldn't make out Karl's comments anymore. His batteries were down and his voice was garbled.

I was impressed with how fast I was going. With a quartering tailwind I was back at Covington before I knew it.

Over Covington I wasn't as high as I had been going down — about 4500 feet instead of 6000 feet. I took a few thermals and went up the Mountain Grove ridge. Familiar territory again!

I took the ridge back to Blue Grass, Virginia. After Bolar Mountain, the ridge goes from a very low to a high ridge. This was my low point and, of course, the scariest. The winds came howling down around the mountain and took me down, too. I had my field picked out. Karl wasn't in sight. I got into an updraft and it took me up without thermaling just as fast as it had taken me down. What a sensation! It lifted me back onto the ridge and before long I was at Seneca Rock, about 250 kilometers out, where I caught wave again to 13,000 feet. This took me back to Cumberland before I went down on the ridge again at Hyndman, where Karl pulled up beside me.

I put the nose down and took the high ridge at Buffalo Mountain. Very garbled, Karl said, "Slow down, it's turbulent!" Then he disappeared down the ridge and went across the Bedford Gap. I had trouble here. Bedford Gap is 16 kilometers wide and every time I tried to cross, I had heavy sink. I got up to 5000 feet again but lost it. I remember looking at the clouds and thinking, *They look great, but they're not cloudstreets.* Once more I got back to 5500 feet and tried again. This time I made it across the gap just about ridgetop. (I realize now I was getting tired and hadn't read the clouds right at Bedford, but I did know that I pretty much had the record in the bag. I was 100 kilometers from home.)

One more gap to go — Altoona!

The ridge was still working. I got high, left the ridge, took another thermal, and crossed the gap with altitude to spare. Now I was sure I had the record made. I was so happy, I composed a song. I rehearsed it, and when I was within hearing range of the gliderport, I pressed the mike button and sang my song for Tom and his Ridge Soaring crew.

Karl came up out of nowhere again, put up his hands and clapped. I thought he was applauding my song, but as I found out afterward, I wasn't transmitting. My radio was dead. No one heard my song! About 3 kilometers from home I saw the towplane following me. I thought it was Tom welcoming me back. Instead, it was my son Dave with our local newspaper photographer.

I dropped my water ballast and landed at 3:58

There's no place like home — especially when you return bringing your very own world record with you! The reception committee included photographer Dick Brown who snapped Doris turning final and rolling out at Ridge Soaring Gliderport, the start and finish of her historic flight.

p.m. — about nine and a half hours after I took off. I had averaged 65.5 mph.

Coming out of the office door as I was landing, I saw Tom plus two of my daughters and all of my friends. Tom was so sure I was going to do this record flight that he had sent out for champagne. Tom popped the cork, it went about 100 feet in the air, and he served my champagne while I was still sitting in the cockpit.

I had wanted this flight much more than any other flight. I was so happy for what I had done! I was the *first* woman to do 1000 kilometers. No one could take that away from me. Someone will probably take my distance record, and that will be good, but no other woman will be the first to do 1000 kilometers.*

This is the fourth record attempt I have flown when Karl was also attempting a record. I haven't had the chance to fly with Tom much except locally, since we only have one sailplane and someone has to watch the business while the other flies.

It sure is wise, though, to have someone else in the air during long record attempts as long as they are not leading you around the course. I have been seriously concerned about being so far down the ridge, alone, in case of landing in a remote area. A search would not begin until after dark or the next day, so it could be days before you were found. I've been carrying emergency survival equipment with me this past year as a precautionary measure.

This record was mine. The decisions were all mine. Some may have been wrong, but I knew exactly where I was going and what I was doing. This was the most incredible flight I have ever made.

HOW MANY MILES IS IT TO FLORIDA, KARL?

**On April 5, 1980, Cornelia Yoder, of Vestal, New York, became the second woman to fly over 1000 kilometers. Taking off in an AS-W 19 from Port Matilda, Pennsylvania, Cornelia flew to Tazewell, Virginia, and back for a total distance of 637 miles (1025 kilometers), exceeding Doris' distance by 15 miles (24 kilometers). — Ed.*

Dick Brown, Centre Daily Times

George Liveges

The day that **Doris Grove's** youngest of six children entered school, she decided to embark on a lifelong dream to do something on her own. Something she could develop and excel in. A challenge. She wanted to learn to fly.

She called the local airport. The power flight instructor was not encouraging. After telling her he would not teach a woman to fly, he suggested she should take the private pilot's ground school course offered at the local college if she were really serious. Soon after, Doris enrolled in the ground school.

The following spring, Doris approached a different instructor and again met with the same negative response. But she didn't give up. After some minutes of reflection, she approached him a second time, this time demanding, "I want to learn to fly!" The instructor conceded. He took her up for three short lessons, but without really "trying to teach her much."

Frustrated, determined, she kept looking. While visiting in Florida, she stopped in at the local gliderport on the suggestion of her brother. There she finally found the support she had been searching for. Not only did she receive serious answers to her questions, she also got enthusiastic encouragement for her desire to learn to fly. She took a glider ride and discovered her challenge.

When she returned to her home in State College, Pennsylvania, she joined the local glider club. A small club of only 15 members, they reflected the same enthusiasm she had met in Florida. Inspired by the achievements of such notable club members as Karl Striedieck and Tom Knauff, by the end of 1972 Doris had soloed.

She "studied like mad." It wasn't long before Doris was contemplating flying cross-country along the nearby Bald Eagle Ridge, but the possibility of an off-field landing intimidated her. Doris prepared. A nice long field right next to her house and 12 miles from the gliderport seemed an ideal place for her first outlanding. During one summer Doris walked through the field every day picking up rocks, analyzing the field from all possible angles, and imagining how it might be to land in this strange field. She even hooked a mower up to a tractor and kept the field mowed all summer. (It wasn't until two years later after already gaining her first state record that Doris made her first actual outlanding. She never did land in "her" field.)

It was also during that summer that the idea of Ridge Soaring Gliderport first bloomed in the minds of Doris and her eventual partner, Tom Knauff; a year later, with the help of several soaring pilots, Ridge Soaring became a reality. As word spread, glider pilots came to share in the tremendous soaring conditions that exist along Bald Eagle Ridge in the Allegheny Mountains.

Doris finished her private pilot glider rating in 1975, and a series of new challenges opened before her. During the years following she set a string of state, national, and world records.

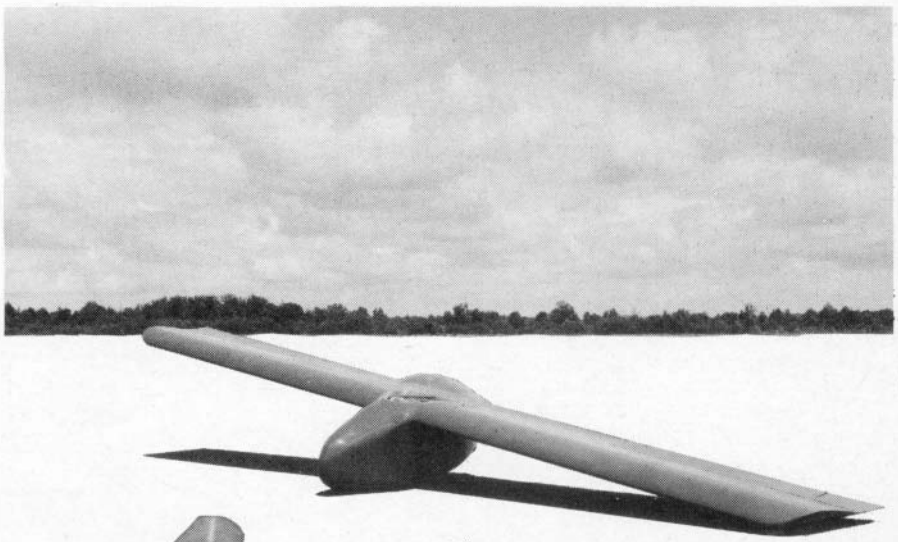
She has only had her pilot's license for 4 years, and it remains to be seen what new challenges she will choose for the future.

—Tom Knauff

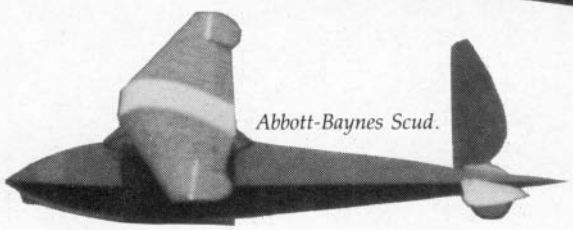
Small is beautiful —

Midget and Submidget Sailplanes

by AL BACKSTROM



An Al Backstrom Plank.



Abbott-Baynes Scud.

Irv Culver's Screamin' Wiener (Ray Parker alongside).

After the SSA Homebuilders Workshop had concluded at Harris Hill (*Soaring*, Nov. '79), I was in a group discussion on low-cost soaring that included SSA Director Bernald Smith when he said something to the effect, "When will these guys learn that there will never be a cheap, easy-to-build, low-cost, high-performance sailplane?"

Right on, Bernald — *there ain't no free lunch!*

There are, however, areas of development that should give the homebuilder (or kit-assembler) the most satisfaction for his or her time and money. A small limited-span sailplane offers a lot of advantages for lower costs, ease of construction, and reasonable size in shop requirements. The price paid for these goodies is in performance, and we'll look at probable performance later.

Now a sailplane of moderate performance will not appeal to many satiated old goats like me. But what about the people flying hang gliders who see their next sailplane up as a 1-26? Let's consider the midget and submidget sailplane.

Historical Precedent

The concepts of Midget and Submidget sailplanes are not new, having been in and out of favor over the years. The earliest Submidget sailplane I know of was the *Scud II*, a 1931 British design. This was followed by the German Hütter designs. About the best of the older midgets is the Irv Culver-designed *Screamin' Wiener* and its follow-ons, the *Rigid Midget* and the *Tiny Mite*. The history and accomplishments of these sailplanes makes an interesting story in itself.

In the early fifties, Fred Hoinville of Australia started pushing the concept of "minimidget" sailplanes. This proposed 25-ft. span class produced a few designs, my own *Flying Plank* and the Horton X being notable examples. The *Plank* has been moderately successful, but its performance was not up to most people's desire at the time, and its minimum sink rate was high enough to make it not well-suited for the eastern U.S. The Horten X was ahead of its time. It really was tomorrow's hang glider, built yesterday when the pilot technique required to get it airborne in the intended manner had not been developed. Let's hope someone will try and pick it up in the future — somebody has to get a Gold Badge in a foot-launched sailplane eventually.

Pleasure and Size

With such a background over so long a period, why have machines in this category been out of style until recently?

When the advent of computer-developed airfoils and glass construction made quantum leaps in performance possible, the soaring world responded with a drive to make the most of the new technology. These advances, while tremendously fascinating to watch, pushed aside development work in other areas for a few years, and photos of a contest line-up today are very boring — almost as if every sailplane came from the same mold.

The performance potential of the small sailplane will never be equal to the big ships, but at the same time I want to draw upon my experience in sailboat racing where it was obvious that the small boats offered almost as much fun — and at lower prices, increased convenience, less labor, etc. Small boats, like small sailplanes, cannot offer the performance of the larger machines. But try and tell a *Finn* or *Snipe* sailor that he must go to larger boats. He's apt to come back with one of the better quotations from boating literature: "The pleasure received from a boat is inversely proportional to its size." This sentiment matches my experience in soaring as well as sailing.

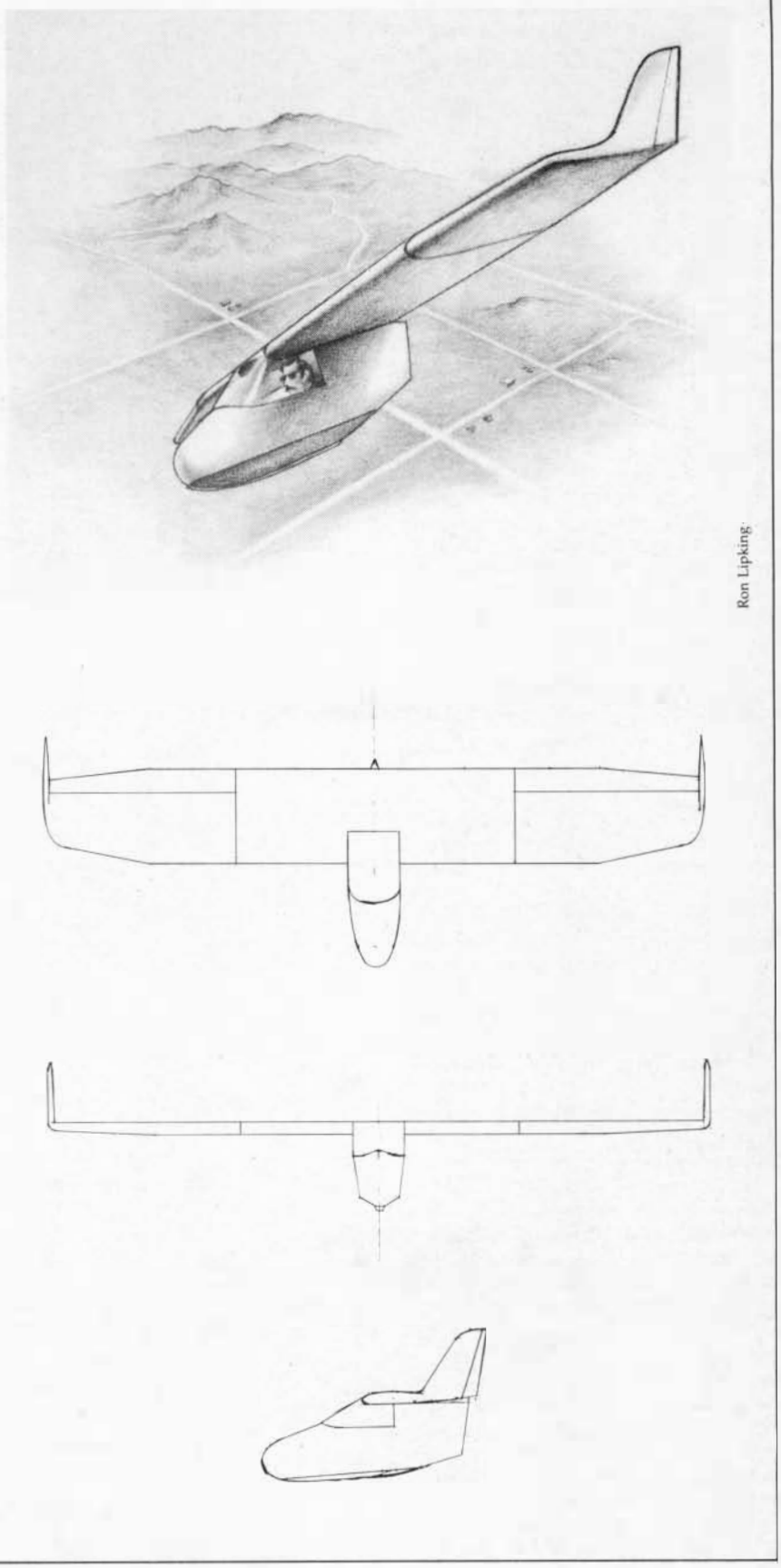
This has worked well in sailing, but what are the possibilities in soaring? Well, the *people* part of the question cannot be answered without clairvoyance (I'm still out looking for that free lunch), but the *hardware* part of the problem can be studied reasonably well. Let's look at two possible development classes.

The 8^2 and 10^2 Classes

The first class will be the Submidget. Let's use an 8m (26.25 ft.) span and an $8m^2$ (86.12 sq. ft.) wing area as specs and call it the 8^2 Class for simplicity. For the Midgets let's use a 10m max (32.81 ft.) span and a $10m^2$ (107.65 sq. ft.) minimum wing area to define the 10^2 Class. As the only justification for these dimensions was to establish size and approximate wing loading, they neatly miss all the current designs that are close (i.e., *Eaglet, Monerai, Mitchell U-2, Woodstock, and Minibat*). Remember, the object is to explore ideas, not specific sailplanes.

At the bottom end of the performance range would be submidgets designed for home construction. By this I mean a design that could be built from basic raw materials without having to purchase kit assemblies — a scratch built sailplane. This might even

An 8^2 Backstrom Plank for the economizing twenties.



Ron Lipking

meet Stan Hall's challenge for a design capable of being built by a "C" student in high school.

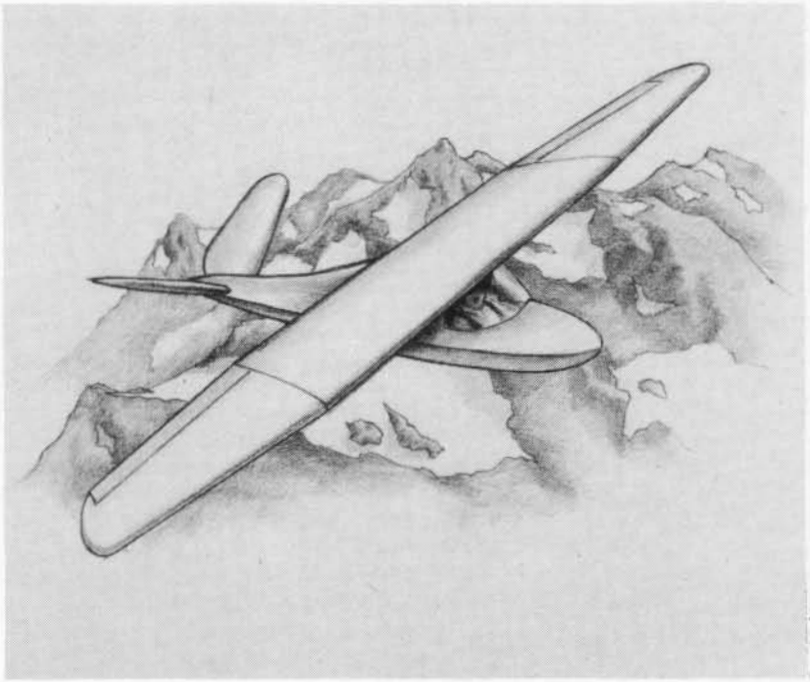
To get the ball rolling, I have roughed out two preliminary layouts. The tailless model is the *Plank* as I would do it today to meet the 8^2 proposal. Vintage Sailplane Association members should recognize the conventional design as being basically an updated *Scud*. Both of these utilize wood structures, pure skid landing gears, etc., with the hope that if anyone followed up on them, they would keep construction as simple as possible without making large concessions that would increase empty weight or drag. The basic light weight should make auto and/or winch tows the preferred launch method. I'll leave the Horton X for someone else to play with.

At the other end of the performance scale for these classes would be an all-out 10^2 Class ship. This machine would probably be assembled from a kit rather than being a true scratch-built homebuilt and is shown here only to cover the area of maximum performance of the class. These drawings show preliminary layouts with the exception of the 8^2 Maxi — that, I leave to your imagination.

The performance curves for these concepts are given in the accompanying comparison polars and are computed values, of course, except for the 1-26 which comes from a Dick Johnson flight test evaluation (*Soaring*, Feb. '77). The hang glider performance is based on the Nash-Webber/McMasters article in *Soaring*, January 1977. As this is a 10m-span rigid-wing type, something like a *Mitchell Wing* is assumed. In choosing machines for comparison, the 1-26 was picked because it represents my idea of the biggest midget, and the only one I know that has been built in quantity. The hang glider was included to illustrate the performance change a hang glider pilot would see during transition.

Along about now, someone always comes along and says, "But I am 6'2" and weigh 220 pounds." Well, sorry 'bout that — I don't intend to suggest you diet. Scratch calculations for this 8^2 group indicate that a 20-pound change in flying weight will change the minimum rate of sink about one tenth of a foot per second. The reason I proposed a limited aspect ratio (also establishes a minimum wing area) was to limit the possibilities of some very small people. Now if competition were to get fierce, there is no way I know that these rules would keep a very small person from tailoring some stuff to improve performance. I do think

Scud 80 — an adaptation as an 8^2 homebuilt.



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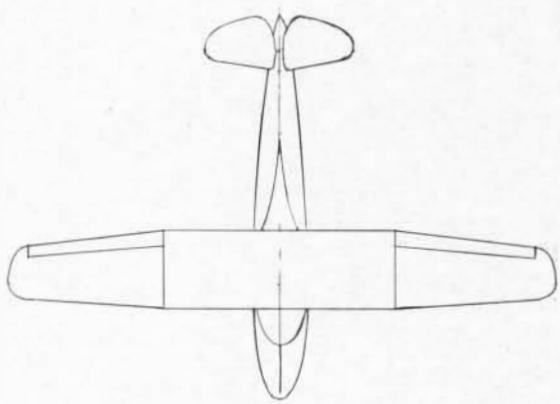
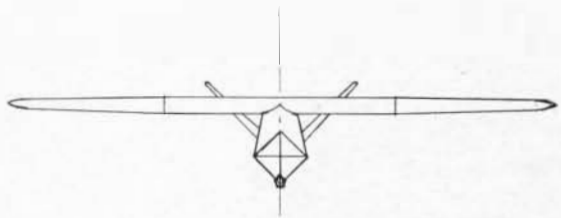
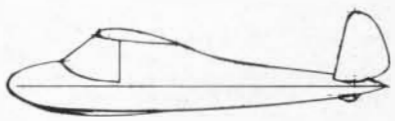
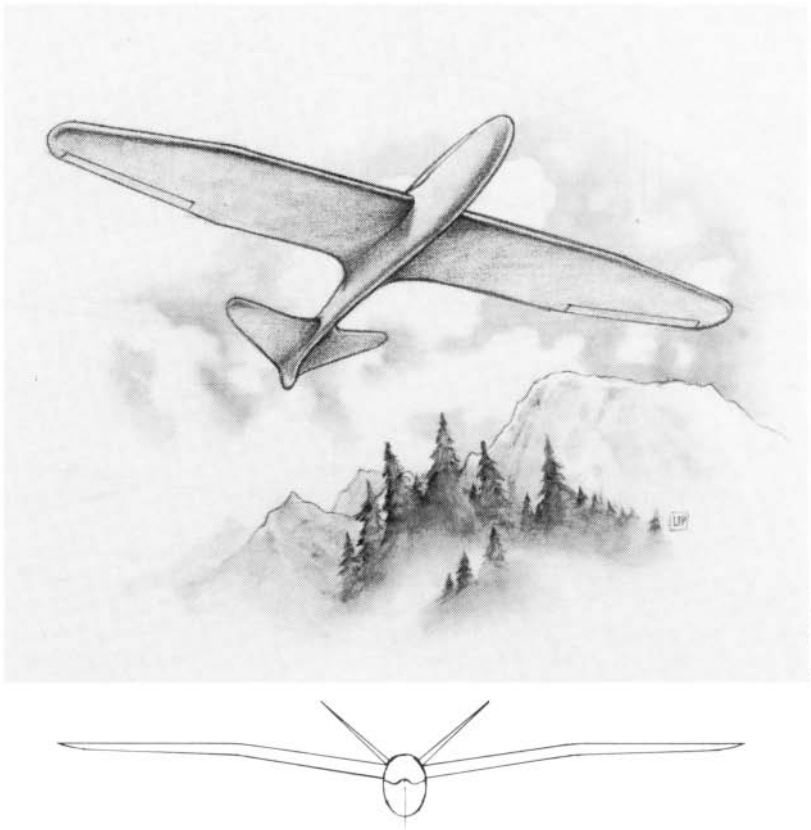






A 10^2 Maxi suggested by the Hütter H-28.



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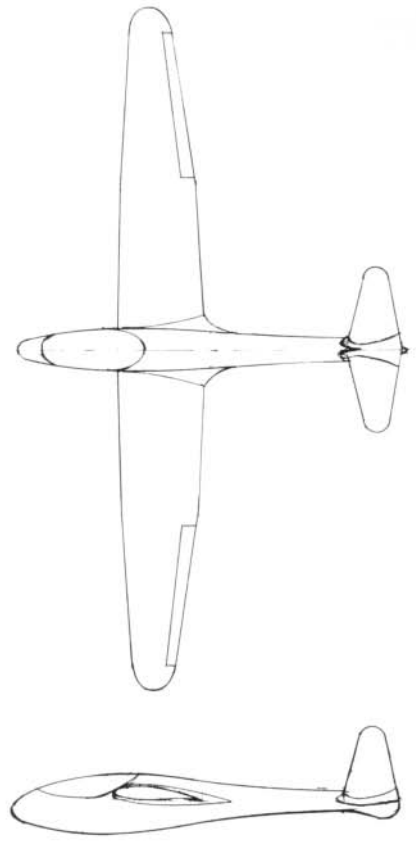


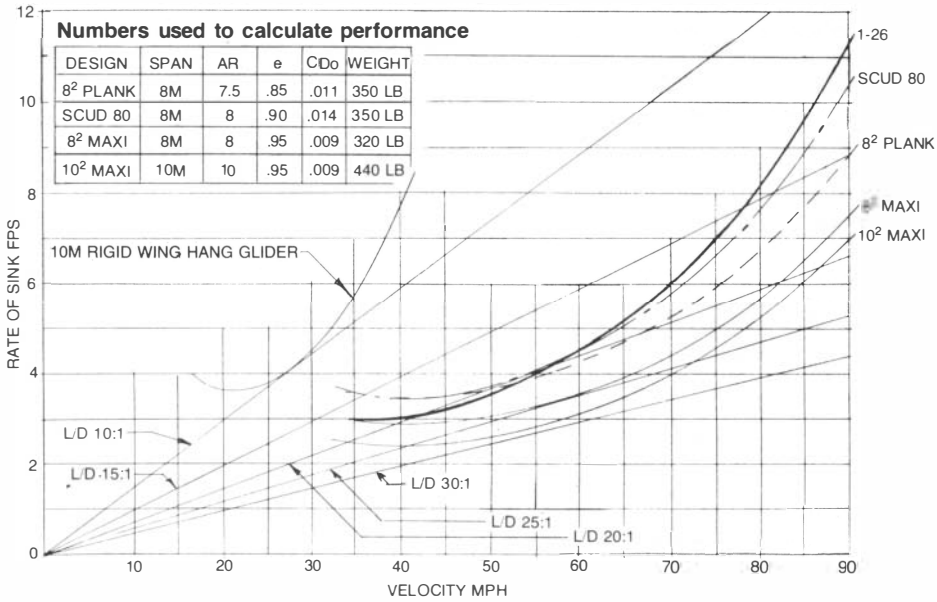
that within reason the proposed limitations will keep these gains within what could be overcome by superior pilot skill.

Conclusion

I think a review of the performance information will show that an acceptable sport-type sailplane of small size can be designed and built. The 8^2 and 10^2 Class definitions are certainly nothing I consider unchangeable or could even defend other than as a basis for making comparisons. I do believe that the way to accelerate development in any area is to have competition with only a few restrictions. By limiting the size, money would not become the final area of competition. To have this happen would squeeze many of the better brains out of competition and these are what we need most. The development of small class sailboats and the Standard and 15-Meter Class sailplane should illustrate some of these points. To put it bluntly, I think there is a need for a development class for midget or submidget sailplanes. Remember — *Small can be beautiful!*

Numbers used to calculate performance

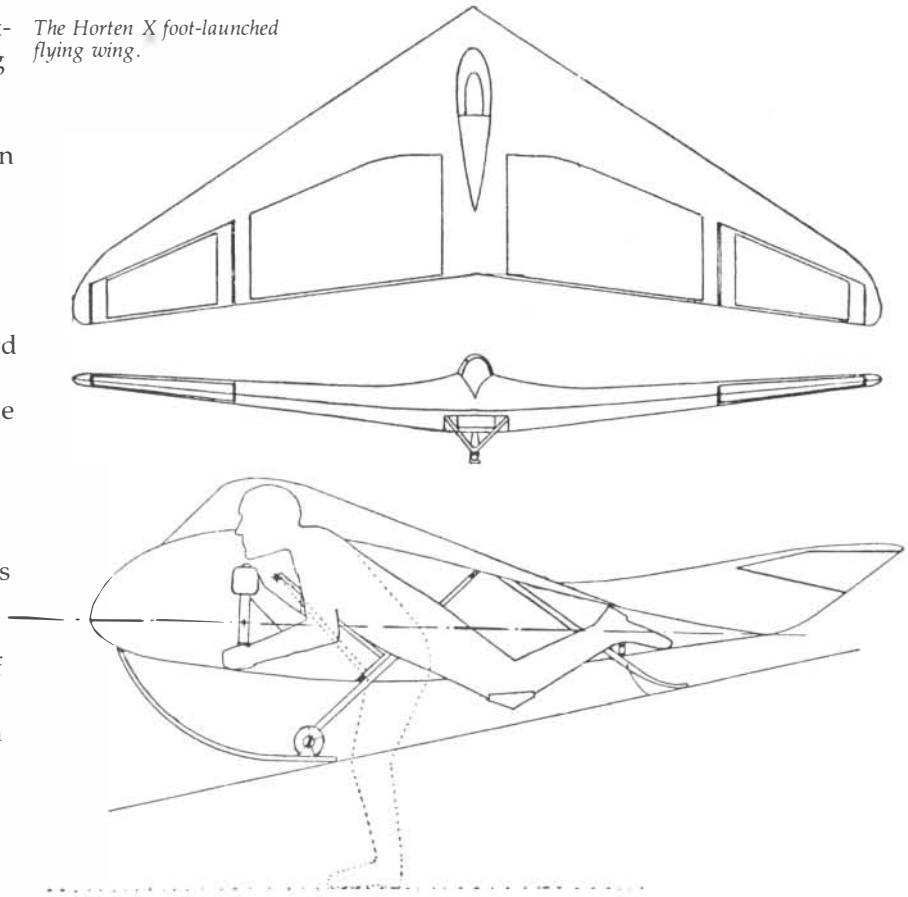
DESIGN	SPAN	AR	e	C_{Do}	WEIGHT
8^2 PLANK	8M	7.5	.85	.011	350 LB
SCUD 80	8M	8	.90	.014	350 LB
8^2 MAXI	8M	8	.95	.009	320 LB
10^2 MAXI	10M	10	.95	.009	440 LB



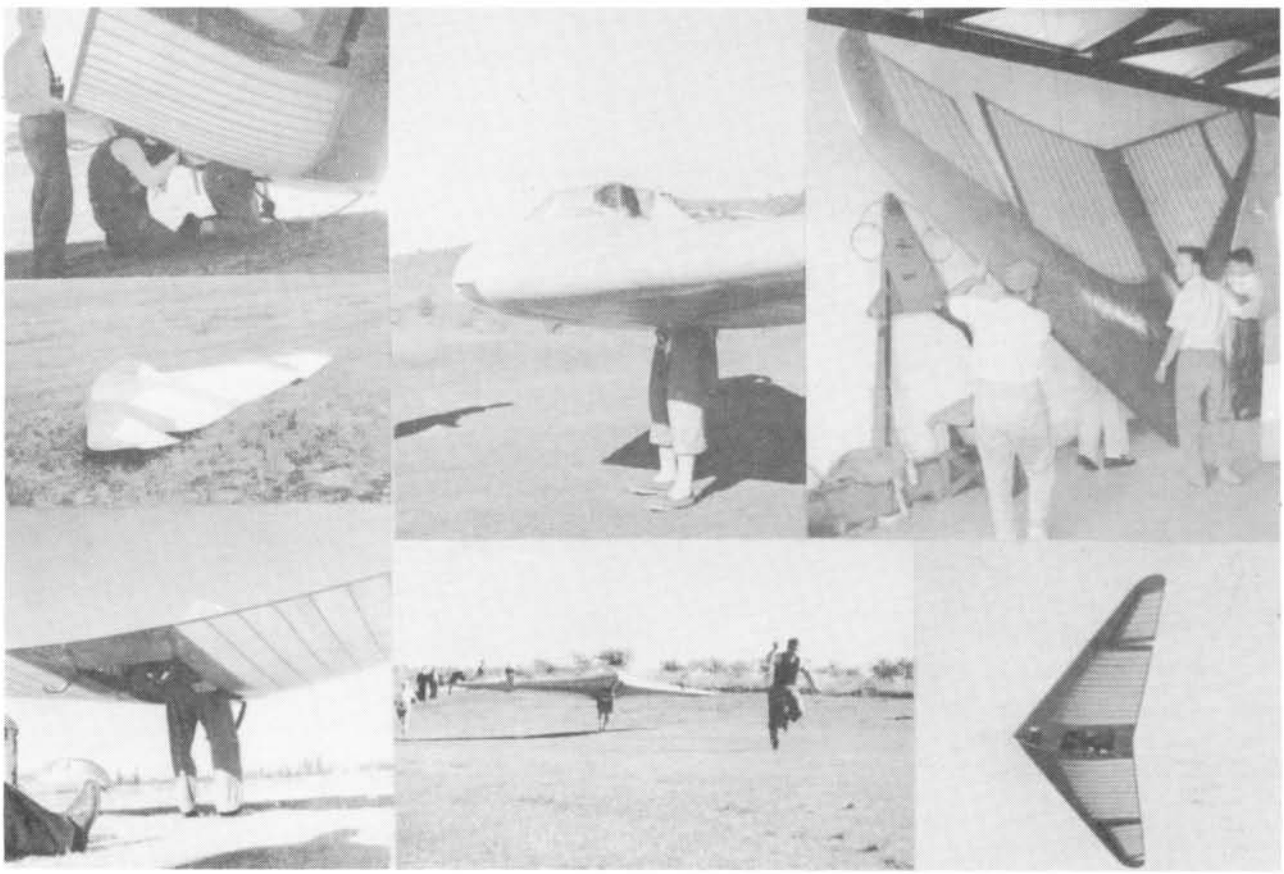
Performance Comparison

Note: When considering the 1-26, remember, it was designed nearly 30 years ago.

The existence of a Horten X foot-launched, 7.5 meter, flying wing in Argentina has long intrigued ultralight enthusiasts. But solid information on the craft has been hard to come by in the U.S., despite efforts by the journal to contact designer Reimar Horten. Last Summer, Jan Scott, president of the Vintage Sailplane Association and an avid collector of information on the fabled Horten flying wings of the '30's, attended an "Old Timers" vintage sailplane meeting in France. Reimar's brother Walter was there and the chance meeting opened communications with Argentina. (Jan is fluent in German.) This exchange has made possible the publication of the accompanying photographs of this unusual 7.5-meter design as well as the 3-view drawing. Scott has also made his translation of an article by Reimar Horten available for publication in *Soaring*.



The Horten X foot-launched flying wing.



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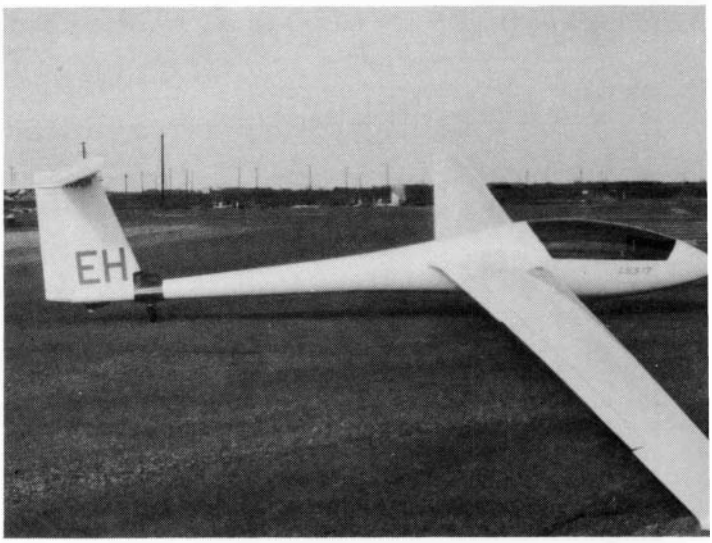
A Flight Test Evaluation of the LS - 3/17



by RICHARD H. JOHNSON

The LS-3/17 is Rolladen-Schneider's new alternate version of their well-known 15-Meter Class high-performance LS-3 sailplane, where interchangeable wingtips provide either 15 or 17-meter wing configurations. This is an attractive option because a single sailplane may then be used as either a 15-Meter racer or high-performance Open Class machine. With the short wings the sailplane becomes an LS-3A and with the long wingtips installed it is designated an LS-3/17 sailplane.

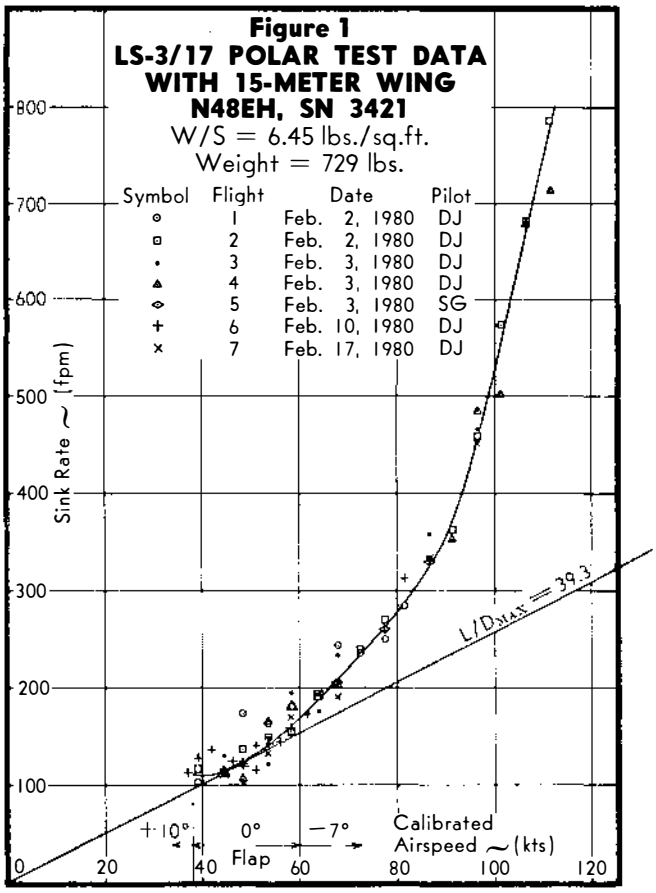
This is not a new concept, but it is an increasingly attractive one because, for relatively little additional expense, one can enjoy flying essentially two separate sailplanes. The extended wingtips reduce minimum sinking rate and significantly improve maximum glide ratio. This permits the sailplane to successfully operate in weaker and more difficult soaring environments such as winter and early or late season conditions. With the short wingtips in place, the sailplane then qualifies for the popular 15-Meter Class competition flying, which generally occurs only during the summertime when thermals are stronger.

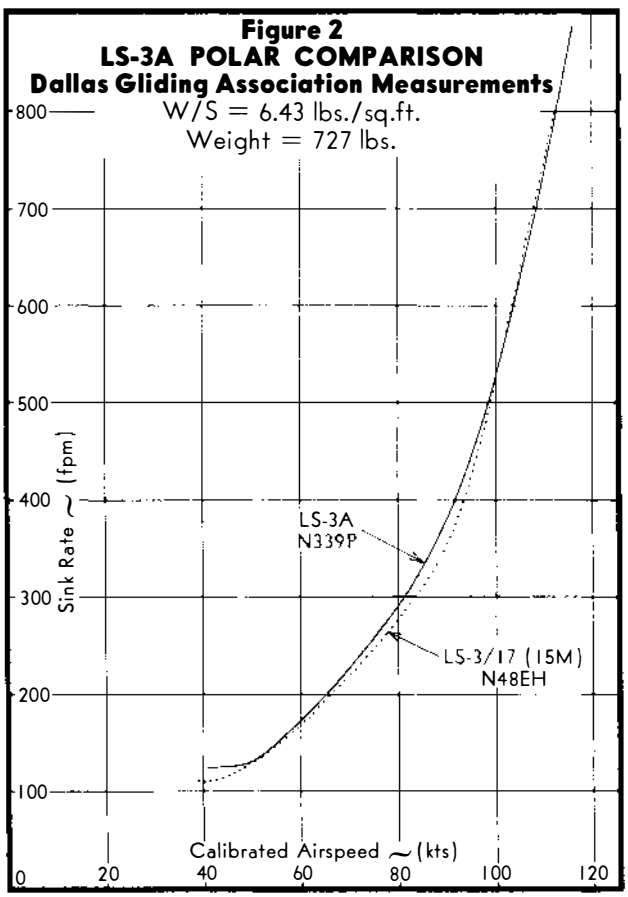
Wolf Lemke, the designer, tells me that the basic LS-3/17 wing panels are being offered in either a light or heavy-spar version. The light-spar model uses the LS-3A wing spar, so there is almost no weight penalty when flying with the short wingtips. Adding the long tips to the light wing naturally increases the spar stresses. Therefore this version is not permitted to carry water ballast and is restricted to an 11-knot lower placard maximum airspeed (135 knots) than the LS-3A. With the optional heavier spar, a weight penalty is incurred when flying the 15-meter version, but carrying water ballast is permissible with either the short or long wingtips.

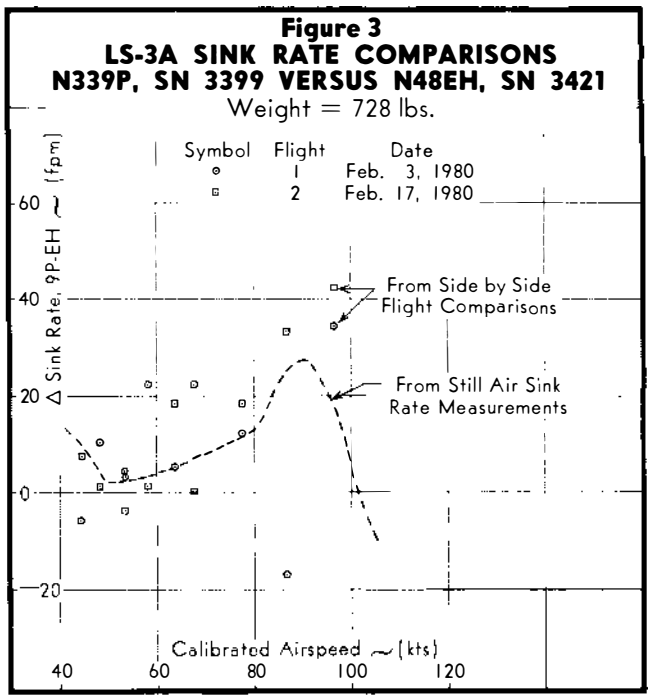
Horst Eschenberg had recently taken delivery of a light-spar version when he called to kindly offer it for flight testing. When it arrived at Caddo Mills, we immediately proceeded with flight test planning for it. Since the earlier LS-3A flight test of N339P (Reference 1) showed somewhat less-than-expected performance, it was decided to test Horst's new LS-3/17 in both 15 and 17-meter configurations. Both their 15-meter wing panels were assembled in the same molds; this was a good opportunity to observe how close their polars might measure during actual testing comparisons. The only physical exterior difference between the LS-3A and the LS-3/17 in its 15-meter configuration is one extra chordwise taped joint for the newer model. The joint is approximately four inches from each wingtip.

An airspeed system calibration flight in the 15-meter configuration showed that the measured airspeed errors were essentially identical to those of the earlier LS-3A (N339P, Reference 1). A total of eleven test flights were made with the LS-3/17 in its 15-meter configuration. Of these, two were made with its wing leading edges roughened by our 20 tape "bugs" per meter span to test its performance sensitivity to insect impact roughening. Two flights were made with 250 pounds of water ballast aboard to test performance at the higher Reynolds Numbers. Some airfoils show a quite measurable drag reduction when flying at higher airspeeds, and the installation of ballast causes the sailplane to fly faster at best L/D and all other given angles of attack. Seven flights were performed clean and unballasted in the 15-meter configuration.

The 15-meter, clean, unballasted sink-rate data are shown in Figure 1. An L/D max of about 39.3 is indicated, and this is about one percent better than the 38.9 measured earlier with N339P. Throughout the 70 to 95-knot region, Horst's newer LS-3/17 (15m) showed roughly 4 to 5 percent less sink rate than N339P. These differences were further con-







firmed by double-towing both sailplanes to 10,000 feet altitude and comparing their sink rates while flying side-by-side in smooth air. Figure 2 compares the single sailplane still-air measured polars for the two sailplanes; Figure 3 shows the side-by-side flight test comparison measurement data.

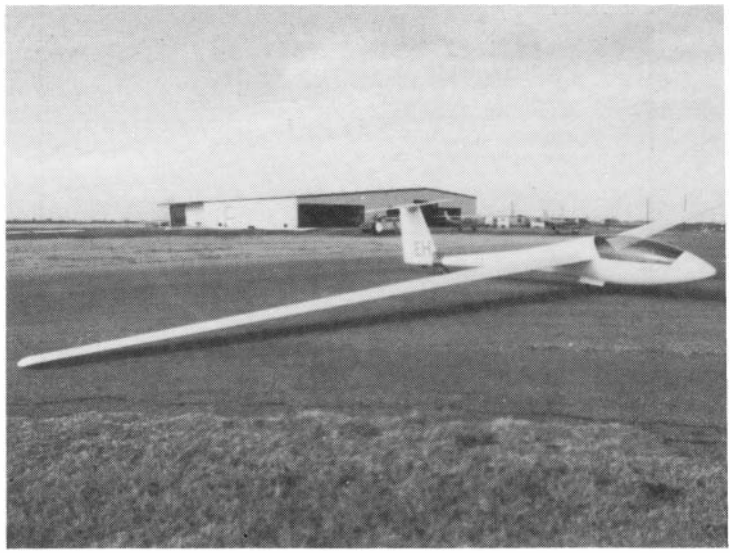
There is no obvious reason why one LS-3A should measure better than the other. If anything, Bob Parker's N339P was slightly cleaner because it lacked the extra taped joints near the LS-3/17's wingtips. Caliper measurements of the wings, fuselages, and tails indicated they were of the same dimensions to within one millimeter (.04 inches). Both were identically well-sealed and surface finished. Wave-gauge measurements of the wing surfaces of Horst's N48EH showed average upper surface peak values of about .0035 inches, and .003 inches peak-to-peak for the lower wing surfaces. Parker's N339P wings showed equal or slightly lower waviness values. The tail-fin-mounted total-energy venturi was removed during all of N339P's test flights, but it was installed during some of N48EH's tests.

Flights 3, 4, and 5 shown in Figure 1 had the venturi installed, whereas 1, 2, 6, and 7 had it removed. The added drag of the standard German Braunschweiger Düse venturi did not appear to have a discernible effect upon the measured sink rates for N48EH. It is quite likely that small differences in the wing profiles are causing the differences shown between the two sailplanes' polar measurements. Very little profile deviation can cause laminar separation bubbles and/or other drag-producing phenomena. Full-scale wing templates would be needed to check this, but fabricating these required more time and effort than we could afford for the project at that time.

Wolf Lemke requested that we test the LS-3/17 (15m)

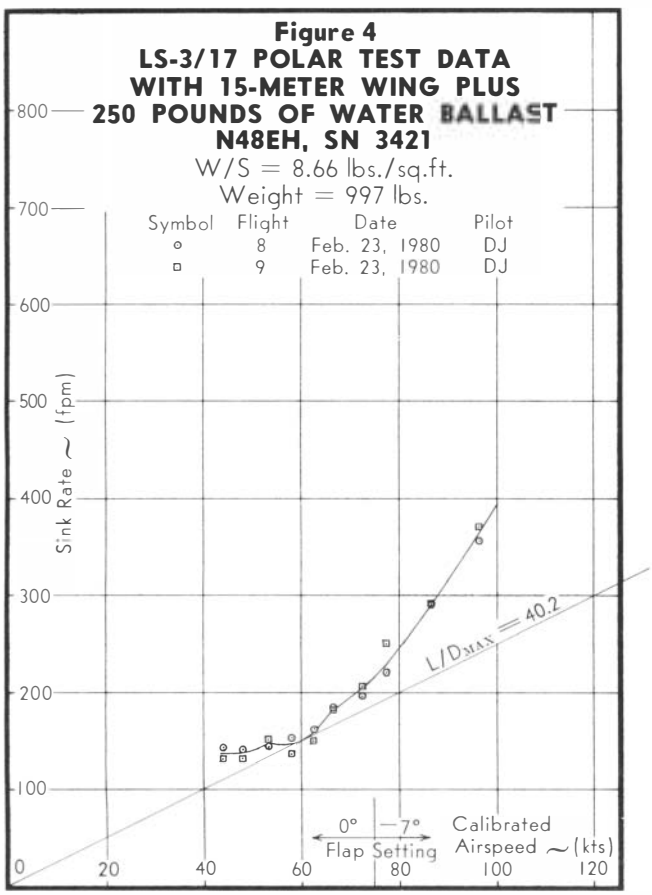
performance with water ballast to measure possible performance improvements associated with the higher Reynolds Number airflows. The second and third test weekends were too cold to permit carrying of water ballast without adding an anti-freeze, but the fourth weekend was finally warm enough. Thirty gallons (approx. 250 pounds) of water were loaded into the wing ballast tanks, and two more high tows were made to measure the ballasted sink rates. The data from these two flights are shown in Figure 4. Though two flights are not enough to define the polar with a very high confidence level, these data do indicate an L/D max of about 40.2 was achieved, which is roughly a 2.2 percent improvement over the unballasted polar.

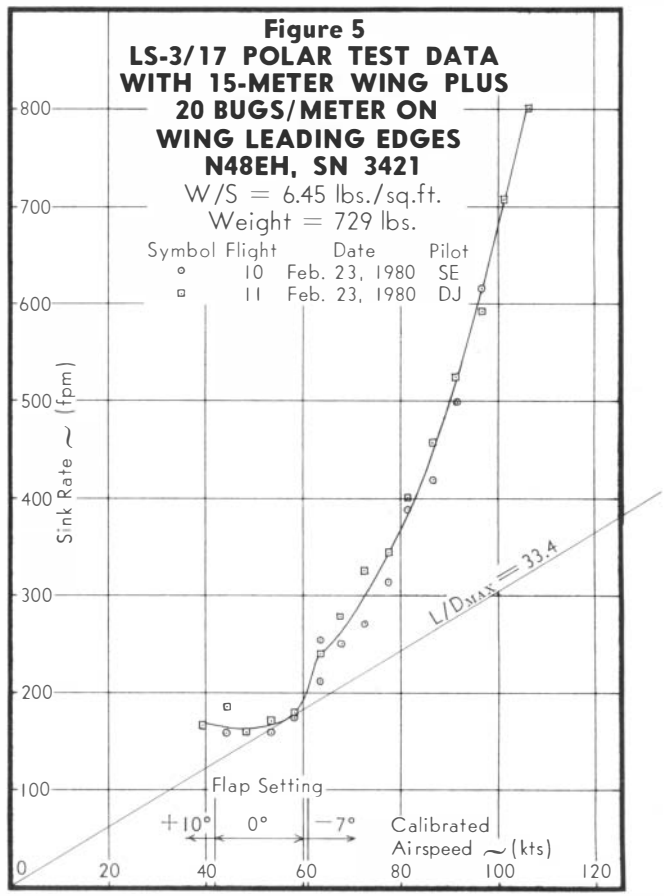
To further test the 15-meter wing's airfoil performance, two flights were dedicated to measuring sink rates with the wing leading edges roughened by imitation tape bugs attached in our standard 20/meter pattern. These test data are given in Figure 5. The L/D max is about 33.4 at 57 knots with roughened wings, which is 15 percent less than that shown in Figure 1 for the smooth 15-meter wing. At 80 knots the bug roughening increased the LS-3A's sink rate by about 32 percent, which is a relatively large performance penalty. It appears that the hook in the sink rate polar at 63 knots was caused by changing from 0° flap to −7° at too low an airspeed. Without bugs the best flap setting for 63 knots appeared to be −7°, but with the roughened leading edges, lower drag could have likely been achieved with 0° flap. When changing from 0° to −7° flap (the next flap-handle notch), the sailplane's angle of attack must be increased to maintain lift, and that apparently causes the effects of the bug roughness to be more severe.



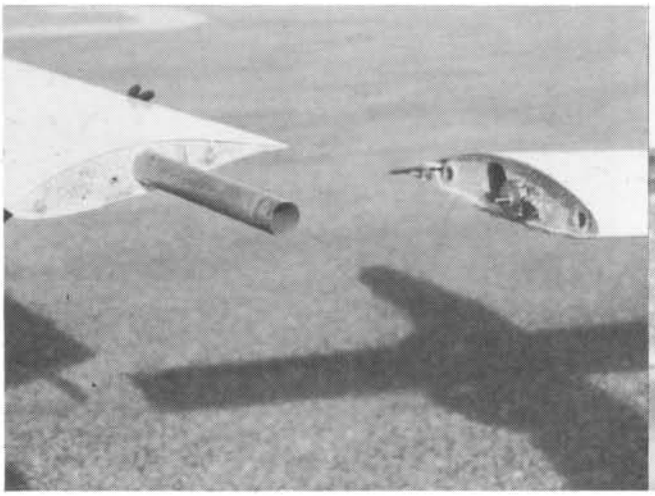
LS-3/17 test vehicle with long tips.

In the 17-meter span configuration five test flights were flown with the long wingtips installed. The sink-rate data

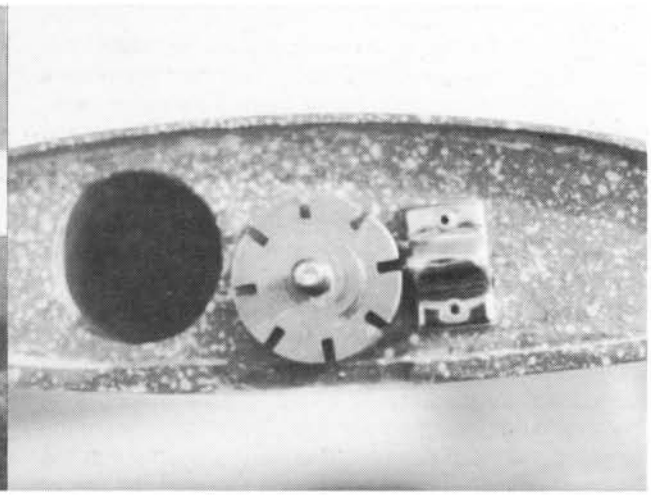




And now, the tip extender: *The concept of increasing wingspan with tip extensions is not new, but it has recently become a viable option on production sailplanes. "For very little additional expense," observes Dick Johnson, "one can enjoy flying essentially two separate sailplanes." Skip Epp's accompanying photos detail the arrangement on the LS-3/17 test vehicle.*



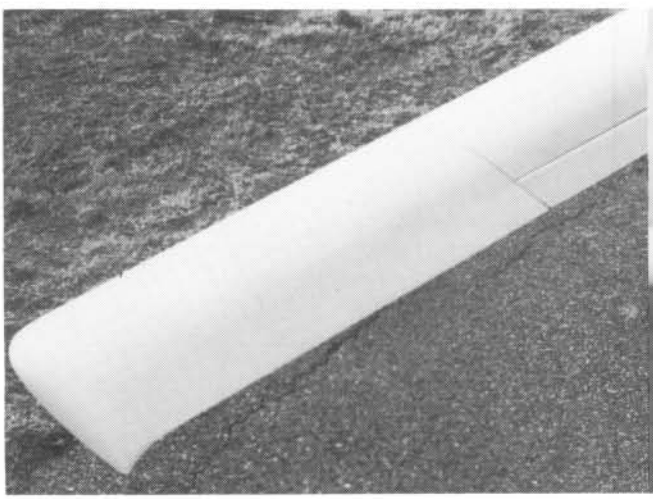
Long tip spar carry-through tube about to be inserted into inner-panel tip socket.



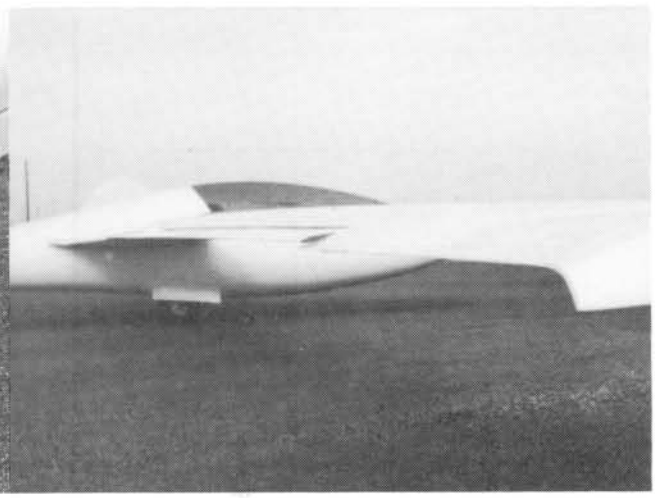
Threaded stud wheel-tip retainer with spring detent lock.

Attaching long tip.

Turning threaded stud tip retainer wheel.



Long tip installed; zero flap setting.

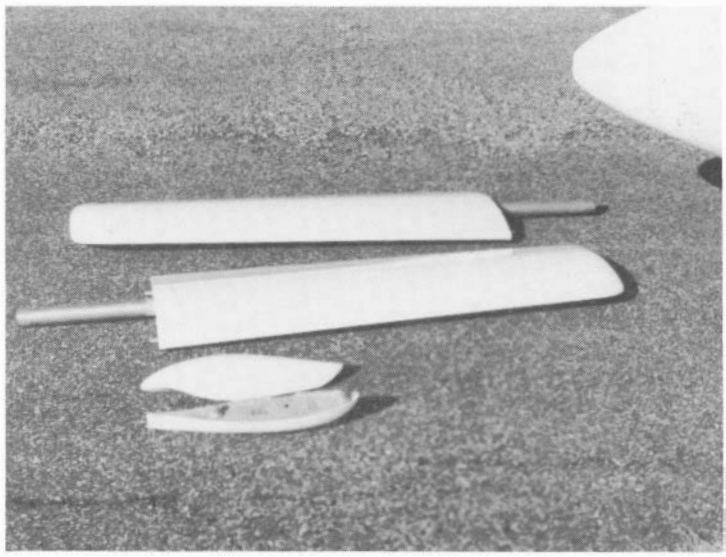


Flap cum aileron at -7° setting. Tip extension is without control surface.

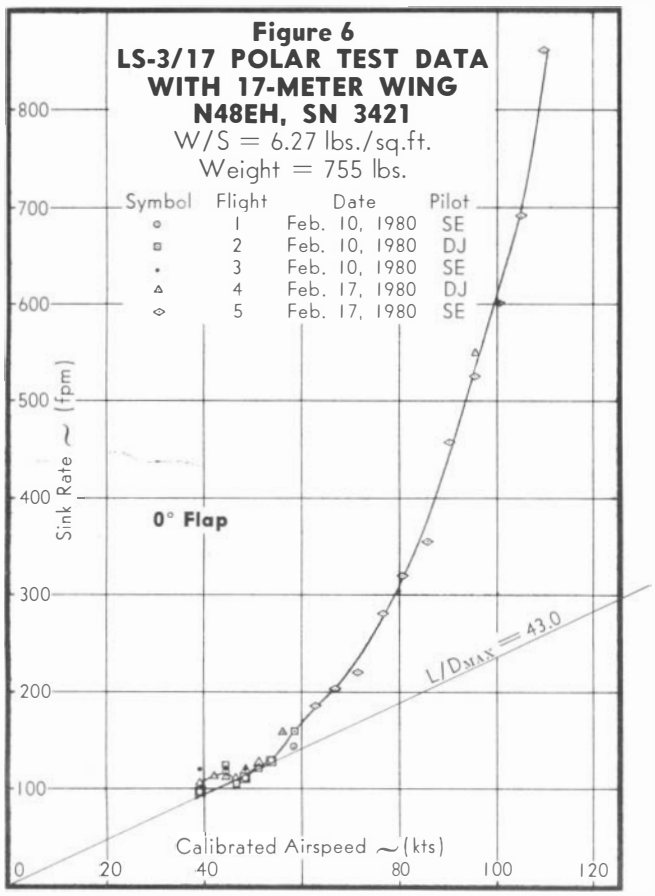
measured with 0° flap setting are shown in Figure 6. A best L/D of 43 is shown at 48 knots, and a low 105 fpm minimum sink rate occurred at 39 knots. The test data show an unusual upward bulge in the polar at 42 and 44 knots. This indicates increased drag in that region that is probably caused by airflow changes over the wing surfaces at those airspeeds.

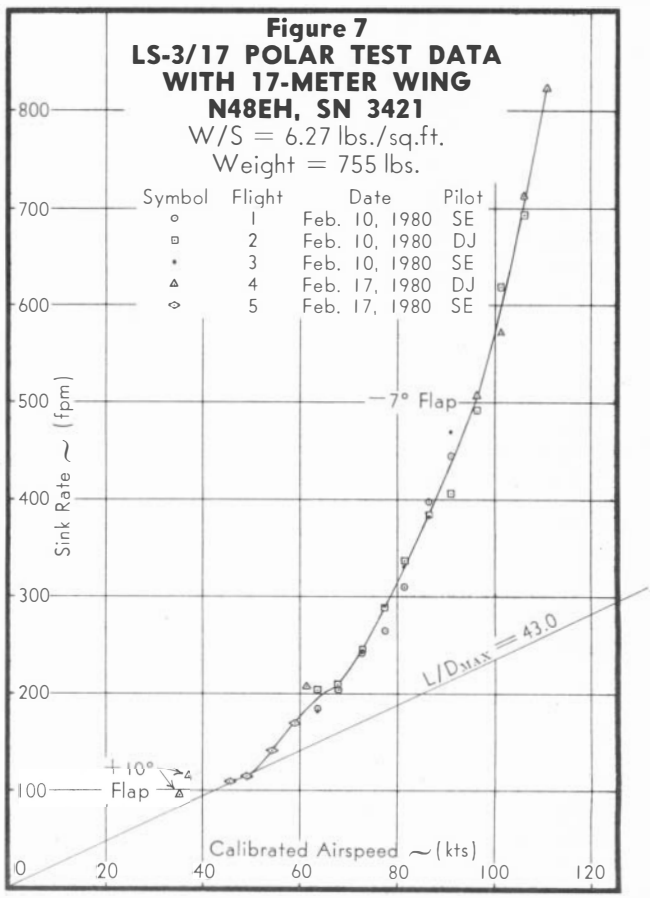
The LS-3/17's flight handbook prohibits the use of negative flap settings with the light-spar version of the sailplane in its long 17-meter wingspan configuration. This may seem to be an unreasonable restriction to the sailplane's operation. However, when one understands that the 1.1-meter wingtip extensions are fixed cambered surfaces having no aileron movable portions (see photos), it becomes clear that the tip portions may carry disproportionally large airloadings when negative flap/aileron settings are used. The ailerons raise and lower on a one-to-one basis over the +10° to −7° flap travel range, just as with the earlier reported LS-3A model.

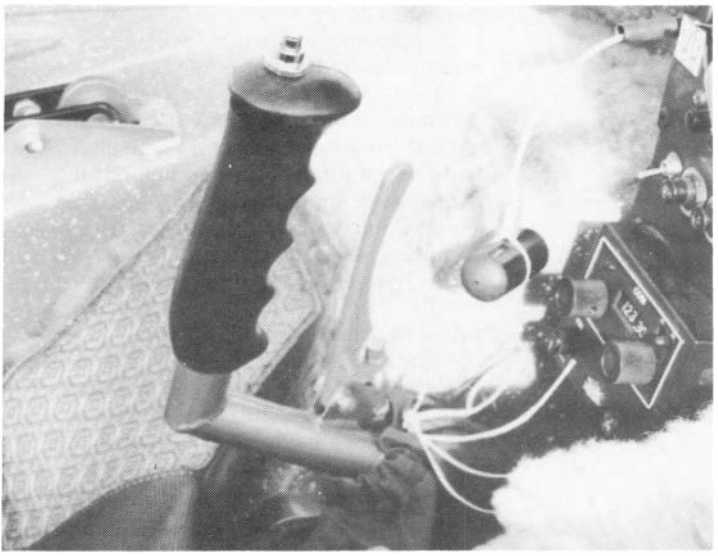
Since our performance testing was confined to smooth-air operations, we decided that a limited amount of long-wing testing should be performed with the LS-3/17 flaps set to the full negative −7° flap position. It is very probable that the heavy-spar version will not be placarded against the use of negative flap settings, so it would be useful to make those measurements. High-speed flight with the full −7° flap setting caused the LS-3/17's wingtips to bend upward significantly, therefore we limited our testing to 111 knots calibrated air-



Tip kit includes 17-meter extensions and 15-meter tip trimmers.







Control stick with new forward stick-mounted trim reset squeeze lever. Wheel brake is still on rudder pedal heels.

speed. With the flaps set to 0°, less wing bending was apparent and full 135 knots indicated airspeeds are permissible (about 129 knots calibrated).

Figure 7 presents the −7° flap sink-rate test data for the 17-meter wingspan configuration. An L/D max of about 43 is shown at 48 knots, but the high airspeed sink rates are only slightly improved over those measured with the 0° flap setting. Figure 8 compares these two polars. The reason that such little performance improvement is achieved by the use of negative flap at high airspeeds is that the highly-cambered wingtip extensions are lifting much harder than they should, thereby causing added induced and profile drag. An obvious improvement all around would be to extend the wing ailerons out through the long wingtips. This would reduce wing bending and drag at high airspeeds and also improve roll control.

Even with the no-aileron long wingtips attached, the LS-3/17's roll rate was a respectable 6 seconds for 45-to-45 degree rolls at 45 knots with +10° thermaling flap setting. With the short tips, the 15-meter configuration rolls measured 5 seconds at the same 45-knot airspeed and +10° flap setting.

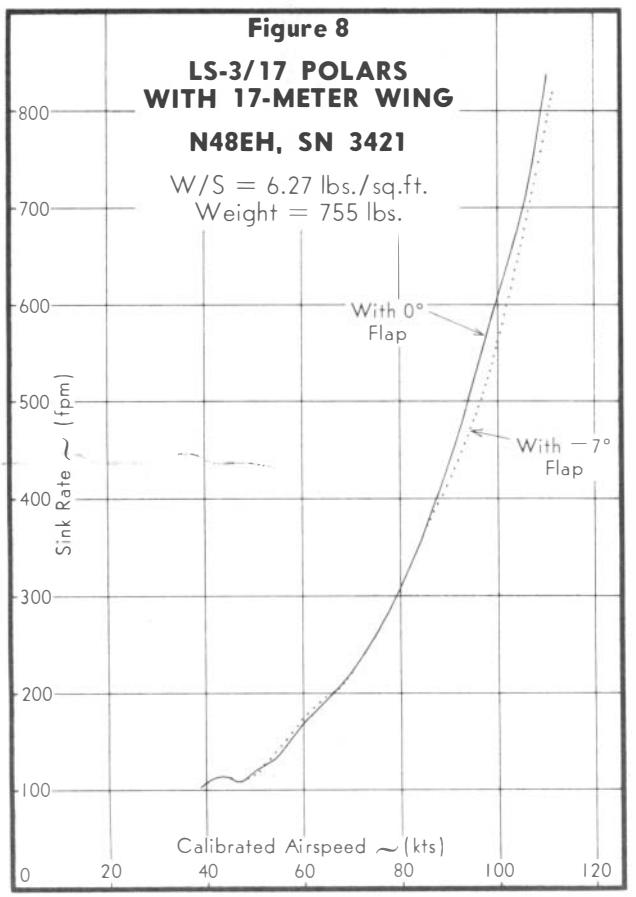
Only two sink-rate data points were measured with the +10° flap setting in the 17-meter configuration, and these are included in Figure 7. A minimum sink rate of about 95 fpm is shown at 35 knots, and this provides the LS-3/17 with remarkably good climb performance in weak conditions. I did not find an opportunity to thermal the long-wing configuration, but several others did. Marion Griffith observed that it climbed right with his unballasted *Nimbus II* in the weak winter thermals at Caddo Mills.

An improvement included in the new LS-3 models is that the elevator trim adjust handle has been moved to the forward side of the control stick (see photo). It looks just like a normal squeeze-type wheel brake handle. However, it functions the same as the *Kestrel* and *Libelle* top stick-mounted trim-reset button. Pressing the squeeze handle allows the trim spring to release, and releasing allows the elevator trim spring to be engaged in the desired new position. It is a quick and easy system to use.

Overall, the LS-3/17 is an excellent sailplane, lacking only slightly in high-speed performance with the extended tips attached. Workmanship is top-rate throughout, and I believe new owners will be pleased with their acquisitions. I personally would like to see the ailerons extended through the long tip extensions. Stability, control, handling, and stall characteristics are all very good.

Many thanks are due Rolladen-Schneider and DGA who shared the towing expenses, to Southwest Soaring personnel who performed the many tows, to Skip Epp who assisted with the photography and flight testing, and to Sherman Griffith, Marion Griffith, and Bob Parker who piloted some of the test-flight sailplanes.

Figure 8



REFERENCES

Johnson, R.H., "A Flight Test Evaluation of the LS-3A," *Soaring*, Feb., 1980

The reader of flight test evaluations should recognize the data are subject to uncertainties regardless of the method used. The data presented are those measured and experienced, but they do not purport to be absolute or always repeatable and comparable to other data. Hence they should be used with appropriate consideration of the implications and uncertainties involved. — Ed.

Is there a gap in our Society between the national and local organizations?

A CALL FOR REGIONAL ORGANIZATION

by JON MEAD

The Soaring Society of America provides a superb service to the U. S. soaring community by providing national guidance and information. National issues involving soaring are expertly dealt with and communicated to the membership via *Soaring*, the official SSA journal. However, as the sport has grown in size and complexity it has become increasingly difficult for SSA to deal with local regional issues from the national office. Furthermore, SSA representatives (Governors & Directors) do not have the resources to adequately communicate with all their constituents. It is my opinion that SSA cannot successfully deal at the regional level. This role belongs, I believe, to the SSA Regional Organizations (RO). Several such organizations presently exist: The Pacific Soaring Council (PASCO), The New England Soaring Council (NESCO), The Seattle Soaring Council (SSC), and the New Jersey Soaring Council (NJSC). I believe more of these organizations working in conjunction with SSA can provide a stronger soaring movement.

What is an RO, what does it do, how does it operate, how can one be started, and finally, what should the relationship be with SSA?

A Regional Organization Definition

An RO is a formal organization which serves a specific geographical area. This may be an entire geographic region, as in the case of NESCO, or a segment of a larger region such as SSC (Seattle), NJSC (New Jersey), and PASCO (San Francisco). The primary purpose of these RO's is to provide the manpower and finances for coordination of SSA Regional activities and publication of a Regional magazine. The four segments of the soaring community (clubs, commercial operators, private owners, and renters) presently have no local and readily accessible method of coordinating and advertising their activities and problems. The RO provides a manpower structure to assist in the organization and operation of Regional events such as contests, social gatherings, FAA airspace meetings, safety lectures, etc. The RO should have a magazine which fills the void between local club and commercial-operator newsletters and *Soaring* Magazine. Local flight stories, reports of club contests/fly-ins, and recent pilot achievements would represent the bulk of coverage by such a magazine. The accent is on events and people of regional interest which might never appear in *Soaring*. The magazine also provides an inexpensive vehicle for regional soaring centers and organizations to advertise services and products in their local market.

The RO is a financially independent organization with the normal set of officers and board of directors. All manpower is volunteer, and the RO finances are a break-even affair which keeps the cost low.

NESCO, a Representative Example

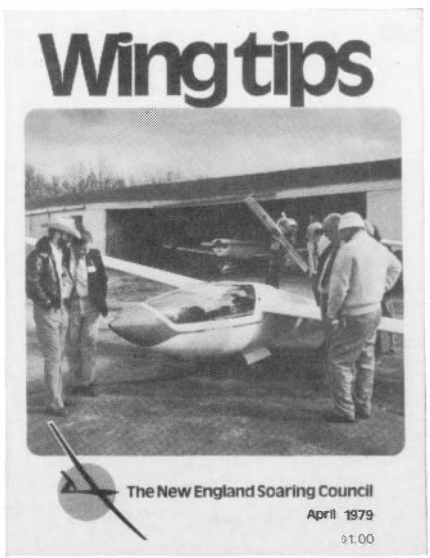
While there are differences, the New England Soaring Council is representative of the existing RO's. NESCO, as it is known, was formed three years ago by a cross-section of SSA Region 1 residents. Included were the SSA Region 1 Director, Massachusetts SSA State Governor, representatives of several clubs, several private owners, and renters. NESCO started with a small newsletter and several hundred members, and has grown to 500 members (55% of SSA Region 1 members). As one of its primary activities, NESCO publishes *Wing Tips*, a bi-monthly 20 to 30-page magazine filled with stories and photos of the happenings in New England.

Besides *Wing Tips*, NESCO holds an annual pre-season party as a Region-wide social affair, and has helped organize and sponsor the last two Regional Contests. NESCO instituted and administers The Red Baron Trophy, a "you-fly-to-and-land-where-it-is, you-win-it" trophy. This trophy has resulted in over 1000 miles of cross-country flights around New England. Through *Wing Tips* and meetings, activities of various clubs and commercial operators have been coordinated and advertised. A "Sailplane Census" provides a ready mailing list for sailplane owners who might want to attend a soaring fly-in or contest. Contacts with the Regional FAA have been strengthened through the SSA Regional Director.

NESCO has, I believe, strengthened soaring in New England. Communication between groups has improved, and regional problems have been identified and resolved. Membership and a subscription to *Wing Tips* must be worth the $7 a year to the 500 people who have joined.

The Regional Magazine

The principal cost of an RO is the printing of the magazine. Eighty-five percent (85%) of NESCO's expenses goes to the bi-monthly printing of *Wing Tips*. We are presently paying $20.00 per printed side of photo-ready copy for high-quality printing of 550 copies of the magazine. This price is a photo offset technique with high quality printing of halftone pictures. A typical issue will cost $400 to $500 to print. (Lower costs are possible with



lower quality printing and paper.) Advertising helps defray this cost while providing an inexpensive way of reaching potential customers. Advertisers pay about $25.00 for a full page ad (less than the 3rd-class postage to mail a flyer to 500 people!), depending on the circulation. NESCO is a tax-exempt corporation (IRS 501 (C) 3) which also helps the financial picture. Not only is the mailing low (about $15.00 for 500 copies of *Wing Tips*) but contributions to NESCO are tax deductible. This provides an additional incentive for members to support NESCO.

NESCO was (as I suspect the other RO's were) founded by a bunch of "hardcore" soaring enthusiasts interested in fostering their sport. While NESCO's establishment was precipitated by the closing of four New England gliderports in two years, an RO need not have such a negative start. NESCO started as an idea looking for a way to happen. It was agreed to float a trial issue of *Wing Tips* funded by $300 of contributions from the founders. A set of the 1000 Region 1 SSA mailing labels were secured from SSA, and a magazine was written, printed, and mailed. After a positive response, the magazine grew, bylaws were written, officers and directors were elected, and NESCO was born.

The key to success is a group of energetic individuals willing to devote lots of time and effort making it happen. Clubs, commercial operators, private owners, renters, and high and low-time pilots, local and competition pilots must all feel a part of such an organization. The principal and most visible part of the organization is the magazine. The content of such a publication should reflect the people and events in the region. Articles about flight testing AS-W 22's and world competition would best be left to *Soaring*. The officials of an RO must be visible and responsive to all the issues in the Region, large or small. Finally, the RO should work in conjunction with, not in competition with SSA.

Complementing Each Other — SSA and RO's

NESCO couldn't have started or survived without SSA. The SSA membership files provide a readily accessible source of potential members. NESCO makes an annual subscription drive which includes all present SSA members. Other than sharing membership rolls, what should be the relationship between SSA and an organization like NESCO?

At the present time none of the existing RO's have a formal relationship with SSA. All of them, however, are working closely with SSA — typically the SSA Regional Director is or was an officer or director of the RO in his area. I believe it is in the mutual interest of SSA and present and planned RO's that a more formal organization exist. The very nature of the organizations' activities complement each other.

I recommend that SSA investigate the ways that RO's may be stimulated and how a formal relationship could be developed. The relationship could include, but not be limited to:

- **Interlocking Directorships**
- **Interlocking Membership** — RO's and SSA actively encourage membership in both organizations.
- **Delegation of certain SSA duties to RO's** — SSA contest sanctions, Regional safety issues, SSA Instructor Certification, etc.
- **Regional Column in *Soaring*** — Help identify what is happening in the SSA Regions.

The list is potentially long, the potential benefits to soaring large. The Regional Organization has been a major asset in several areas of the country. Maybe you should try it in your Region.

PART III

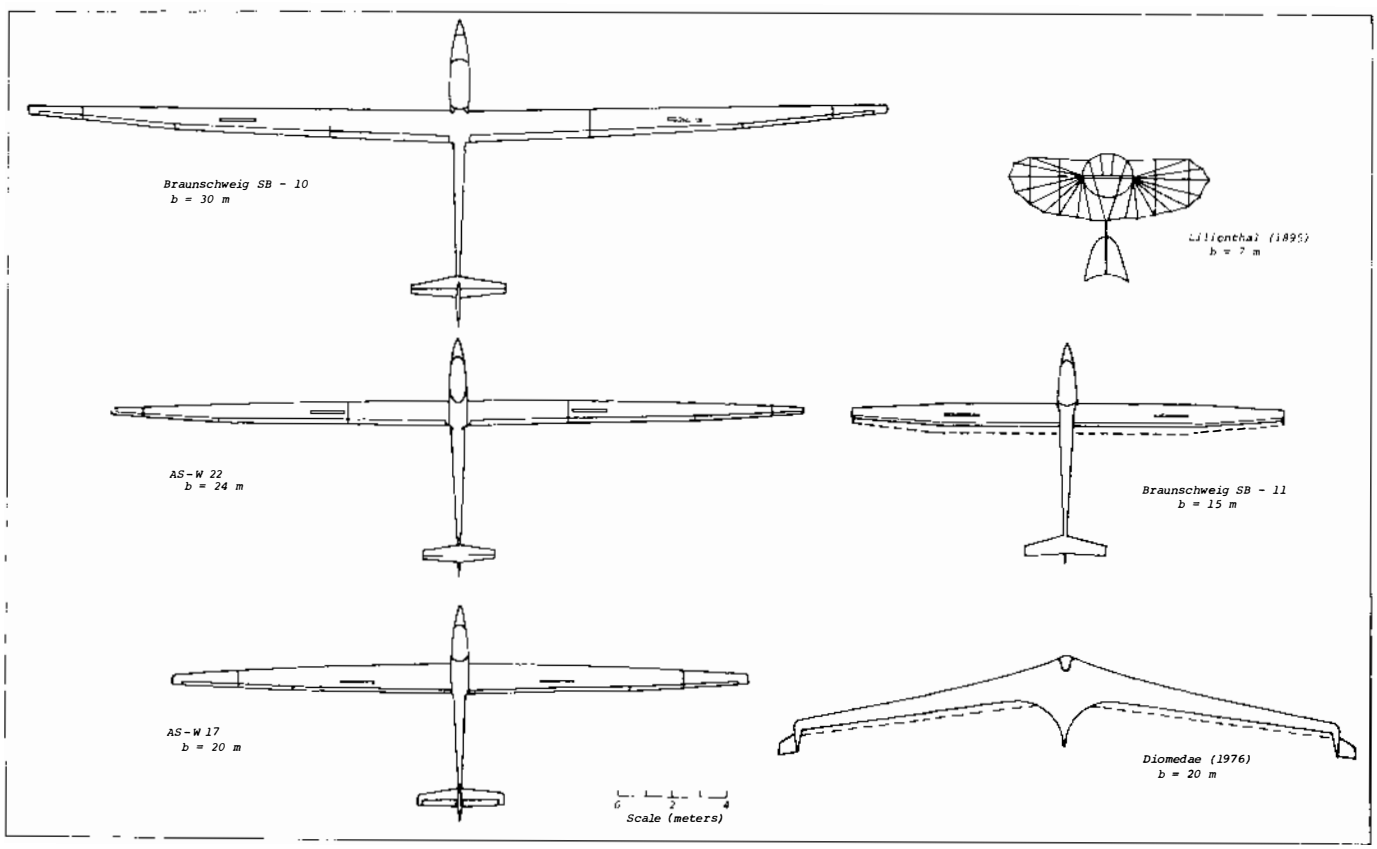
ADVANCED CONCEPTS IN VARIABLE GEOMETRY SAILPLANES

by JOHN H. McMASTERS

In the previous two installments of this article a prognostication was made that variable geometry techniques for racing sailplanes would be with us for a long time to come. I still believe this, but it is also apparent that there are other ways to design advances for very expensive racers. This was most recently dramatized to me by discussions with Gerhard Waibel and others at the winter SSA Convention in Seattle. The question thus arises as to how and where the more "conventional" new AS-W 22 (Reference 17, fits into the performance picture for the various variable geometry schemes previously discussed (*Soaring*, April & May '80). My merry pocket calculator cried out to be allowed to make a comparable performance assessment of a machine of AS-W 22 dimensions relative to the "baseline" *Nimbus* used in the earlier discussion. Not to be denied, here is its (and my) diagnosis.

Shown in Figure 8 is a planview comparison (again to the same scale) of the present AS-W 17, the new AS-W 22, and *Diomedae*, a little fantasy beasty of my own which will be discussed later. My! Isn't the AS-W 22 with its six-piece, all-carbon-fiber, 24-meter wing a monster? (The AS-W 22 *is* a variable geometry sailplane. The span can be altered — on the ground — by adding and/or subtracting wing panels, thus varying span from 21 to 24 meters. It also has a cruise flap.) I must say at the outset that I hope to remain on speaking terms with Herr Waibel, and must thus point out that all my numbers are approximate and theoretical

Figure 8. Some Advanced Sailplanes



and may not represent exactly what Gerhard had in mind when he designed his new beauty. I'd be more than pleased to hear his side of the story when he's prepared to tell it in the pages of *Soaring*.

Before we play with some numbers on an AS-W 22 type machine, a few items not adequately discussed earlier should be elaborated:

- We are rapidly entering the next-generation era of composite materials (e.g. carbon fiber, Kevlar). What these materials allow us to do (if intelligently used) is to build either lighter structures of given stiffness and size than was possible with fiberglass or build bigger structures — in this case longer span, higher aspect ratio, and maybe thinner wings of adequate stiffness and weight (provided we can afford the cost of these new materials). Read both Waibel's and Holighaus's papers on these matters in the *Proceedings of the 1980 SSA Convention.* Good stuff.
- Competition flying techniques have changed with advances in sailplane performance. The thermal-soaring racer, optimized to fly in the classic MacCready sense, is not necessarily the best "dolphin-style" configuration. If less time is "wasted" in circling, then the race can be won by a machine with very high glide ratio lumbering along at slightly less than breakneck speed between regions of lift. Such an approach favors wings of great span. Read the new gospel according to Reichmann.
- Bugs, and the reduction of their adverse effects on performance, will loom larger and larger as we soar into the eighties. We know a great deal about the aerodynamics of racing sailplanes in their pristine bug-free configurations. We also know a lot about airplanes with thoroughly turbulent boundary layers. But in between? We have a lot to learn here, and as an alternative to developing bug-proof wings, we might in the meantime reduce total drag by working at the *induced* drag problem once more. And that (coupled with new materials) means notching the wingspan up to some new limit. Whether that new limit is 24 meters, 30 meters, or whatever remains to be demonstrated.
- There are whole branches of aeronautical technology being developed for airplanes other than soaring racers which haven't been exploited by sailplane designers yet. Of most immediate potential interest is the progress being made in microprocessors and developments in reliable stability-augmentation systems. What these new "fly-by-wire" systems mean for us is that the reflex limits of the puny human brain (which evolved for walking, not flying) can be partially circumvented, and we may yet see the emergence of the *ultimate* racer in the form of the long-sought pure flying wing. More on that later.

Superspan Madness

With the previous comments in hand, we can now attempt to assess the goodness of the AS-W 22 recipe as the next generation Open-Class racer. I don't have the data on the specific airfoil Waibel has used in his new machine, but with the data previously presented in this series, a few minor adjustments can be made to the basic *Nimbus*/AS-W 17 configuration to see what the increase in span and aspect ratio of an AS-W 22 type wing might do to the straight-away glide polars of the baseline *Nimbus* shown in the previous Figure 4.

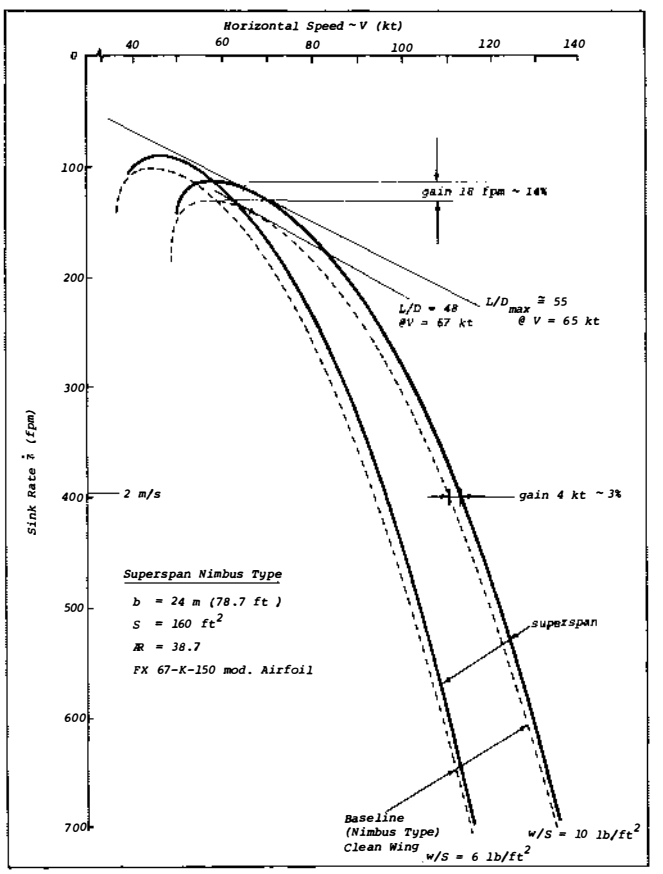
In the process of this comparison we will close an incredulous eye on several factors. Namely:

- The idealized induced drag calculated by my analytic wind tunnel assumes that there is little torsional deflection of the wing over the entire speed range. Such local deflections on such a huge wing might distort the span loading to the extent that the full benefits of the span increase might not be achievable over the full range of speeds. That's one of Gerhard's structural problems, however.
- We shall take it on faith that the airfoils on the ten-inch chord wingtips work as required in a consequent seriously depressed Reynolds-Number range. Note also that because the wing span has increased dramatically and the area hasn't, the aspect ratio has increased considerably compared to the *Nimbus* baseline. Thus the distribution of chord across the span has been reduced resulting in all wing sections operating at a lower Reynolds Number at each speed when compared to the more modest-span machine.
- We shall ignore altogether the problems of performance and lateral control when the new monster wing is forced to turn and bank as it inevitably must on occasion.

With all this said, and the values assumed for our superspan machine listed on the graph, we estimate the performance shown in Figure 9. Here the comparison is made for clean wings at 6 lbs./ft.^{2} (a value representative of an AS-W 22 with a sixty-pound pilot) and 10 lbs./ft.^{2} wing loadings.

Well. The clean-airplane performance increase is not truly spectacular, but if achieved in practice, it is likely good enough to win some contests. To see whether the increased span helps the bug problem, we can look at the comparison

Figure 9. Predicted Performance of a Superspan Sailplane



shown in Figure 10 for the dirty airplane at 6 lbs./ft^2. The answer is yes and no, depending on which end of the polar we look at. What these results show is merely an amplification of the general design recipes spelled out in Box A of Part I (*Soaring*, April '80) of this series of articles.

Over the low-speed region of the polar (including the points for minimum sink rate and maximum L/D) where induced drag is large in proportion to the total drag of the machine, span increase helps performance quite a bit. By simply changing span, however, we have done little to change the components which influence viscous drag (i.e., the airfoil section, the total surface area of the machine, or the shape of the fuselage, etc.). And it is largely viscous drag which influences the high-speed end of the polar. We've already seen where an assault on the viscous drag part of the problem led Pat Beatty with his B-5. Waibel's approach is likely the more reasonable, especially in buggy conditions, particularly when a fellow as clever as Gerhard makes the other necessary minor adjustments for viscous drag sources necessary to translate from AS-W 17 to AS-W 22. We shall see soon enough.

Whether my performance estimates look encouraging for an AS-W 22 type machine or not, I hardly expect anyone to transfer his order for an AS-W 22 to a B-5 or fs-29 on the basis of my analytic wind tunnel results. I should, however, point out a few additional aspects of my estimation technique:

- None of the machines I've analyzed is the exact counterpart of the actual versions built. My numbers are, however, reasonably representative of the performance *potential* of each real airplane.
- The analysis methods I've used are representative of current transport aircraft industry prediction methodology. Account is taken of a number of "second order" factors such as variations in viscous drag and maximum lift with Reynolds Number (or flight speed and lift coefficient), wing span efficiency factor variations with lift coefficient and aspect ratio in the induced drag calculations, and so on. (No parabolic drag polars are used.) Such methods usually make rotton absolute predictions, but are pretty good at predicting the effects of configuration *changes* on a good set of baseline data.
- Only my analytic wind tunnel (computer) is clever enough to calculate maximum lift/drag ratios like 49.32876 and draw a pencil fine line to comply with such "accurate" values. All real *experimental* data — including *all* wind tunnel data — show some variations about some mean line. (This has something to do with the character of turbulence, experimental measurement equipment inaccuracies, and Heisenberg's Uncertainty Principle). When presenting any experimental data as a single fine line, the wary reader should always remember that at best this line represents the statistical mean of a band of data, all scattered points within which some physical reality is represented. Thus, in making performance comparisons between real airplanes, we should be overlaying polars which look like fuzzy bands rather than fine lines. Dick Johnson knows this very well; many less sophisticated sailplane buyers don't seem to, however. Alas.

Epilogue

We have now evaluated four distinct recipes for advanced Open Class racing sailplanes and I have about run out of calculator budget. But before leaving the field once more for the greener pastures of ultralight sailplanes, some final questions come to mind. Where does racing sailplane performance increase end? What is the limit? Is there a limit?

To get some possible answers, I went back to the article Jim Nash-Webber and I wrote three years ago on soaring in the year 2000 (Reference 1). Therein is the *Diomedae* flying wing shown in its fully laminarized form and redrawn here without the laminar flow control (LFC) in Figure 8. It still looks good with a maximum glide ratio of between 92 and 98 with the LFC system and around 60 without it. The flat, flat polar looks very good, but the DM 700,000 price tag (in DM 1980 with LFC) may be a little formidable. Fly-by-wire control and solar-powered LFC systems don't come cheap. On the other side of the coin, however, what brave soul in 1970 would have projected a market for DM 100,000 AS-W 22's? We clearly have a long way to go before we can even predict limits for the Open Class.

REFERENCES

1. McMasters, J. H. and Nash-Webber, J. L., "Soaring in the Year 2000 — Some Technical Extrapolations," *Soaring*, Jan. 1977.
17. "More on the AS-W 22," *Soaring*, Dec. 1979, p. 11.

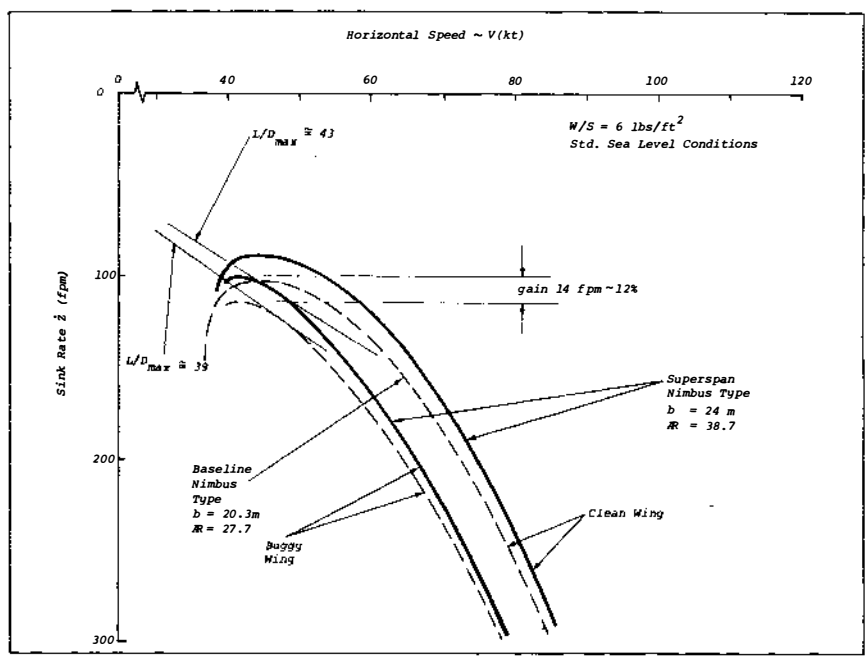


Figure 10. Effects of Bug Contamination on a Superspan Sailplane

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SOARING TO WIN

GEORGE MOFFAT

DECISIONS, DECISIONS

Soaring, especially contest soaring, is an endless series of decisions. Since, among the topmost level of pilots at least, skills tend to be almost identical, the decision element is usually the deciding factor in contest results. What factors involve decision making? By what means are decisions to be made? These are the top priority questions for the successful pilot. As A.J. Smith said at one of the Byars-Holbrook Symposiums, "If you haven't made a decision in the last minute, you're loafing."

Rather than just decisions, perhaps we should have a look at what we might call the "decision cycle." This consists of observation, resolution, and action. This is a necessary cycle for intelligent action in soaring or any other field. First, one must examine the situation for all the pertinent data. Next, one must resolve the information and formulate a plan. Finally, one must act. A pilot who is able to run through this sequence five times is almost certainly going to defeat the pilot who can only manage three cycles in the same time. We have all seen the pilot who gets to the top of the thermal and then makes two or three extra turns as he tries to decide what to do next. Obviously he is going to be defeated by the pilot who has used the thermal as time to solve the first two steps of the cycle and is all ready for instant action. We are also familiar with the type who runs through the first two stages successfully but then dithers about for seconds or minutes before finally committing himself to action. Unless new information is available, this time is irretrievably lost.

As important as making decisions is, so is the avoidance of unnecessary ones. Always at contests one hears some pilots giving detailed instructions to crews about how to wash the sailplane, when to bring the lunch, what to put in the cockpit, etc. In the air the same pilots may be heard telling crews exactly where to drive and so forth. All of this is unnecessary and distracting for the pilot, keeping him from concentrating on things that could make a difference to his speed. He should have standard operating procedures for as much of the ground preparation as possible. From at least an hour before the takeoff, a single criteria should govern all the pilot's thoughts: *Will it help me fly faster?* If it won't, forget it. Literally.

How about a brief list of typical decisions before and during the contest? Before the contest, consider ship type and instrumentation. A brand-new ship which will probably be delivered late is usually not worth a 3 percent performance improvement unless the pilot is very used to flying many types of ships. Fifty hours is about the least time which will allow an experienced pilot to get the most out of a new sailplane. Much the same is true of instruments. It takes time to get to know them. Better a less-fancy panel that you trust than a lot of sophisticated new gauges you don't feel at home with.

Once the contest is started, takeoff time and start time are the really basic on-the-ground decisions. Don't allow

other matters to distract you from factors that might cause a change in either of these two.

Once on course, altitude band for best lift, best interthermal speed, proper course between thermals, and thermal selection are all vital. Unless the weather changes, the altitude band decision can be made once and then reviewed only occasionally. The same is true for interthermal speed, if conditions are steady. Consider the inputs on interthermal speed, however. A day with good cumulus and predictable lift may call for flying at MacCready-ring speed. On a dry day with widely-spaced thermals you might decide to fly 10-15 knots slower in order to increase searching range, giving up a knot of theoretical speed-made-good in order to be able to be more selective about thermals.

Proper course between thermals is probably the most vital decision and the one which must be made and reevaluated almost continually. Minimizing sink is just as important as finding lift. A straight line is rarely the shortest distance between two points in a sailplane. Will a small detour take you by some healthy-looking clouds, lead you over lift-producing hills, help you avoid a river bottom area? Don't be mesmerized with the course or the immediate goal. Look around, think about the big picture.

At the end of the day and again at the end of the contest, review the decisions made. How did they work out? Did certain situations or types of weather cause too much caution? Did you tend to go like gang busters for 50 miles and then lose half an hour getting up from a low save? Were you great for four days and then progressively worse? All these and many more symptoms should tell you things about the decision-making process.

Consider methods of decision making. Most of us learned in school the traditional mathematical-scientific procedure of gathering evidence and using it to build a logical conclusion. This method works well and is normally the preferred procedure. It is not, however, the *only* procedure. Logic, Einstein told us, is by nature self-limiting. He and the French mathematician Poincaré,* not to mention Danté in *The Divine Comedy*, insisted that genuinely new perception must come from the "jump of intuition," as Einstein called it. How does this work in our airborne world?

The observation stage of our decision process apprehends thousands — perhaps millions — of items within the range of our sensory perceptions. Isn't it frustrating to know how much useful information is there if only we could learn to read it!

Past experience and the conscious part of our minds tell us that blowing smoke shows wind direction, cloud types suggest thermal conditions, etc. But how about the hundreds of things seen which have not registered on the conscious level of the mind? A strong intuitive feeling that such and such is the proper course of action may be a result of the subliminal working of some of this subconscious input.

*(In an essay entitled "Mathematical Creation," written in 1905).

Most great thinkers have realized that one must transcend the limits of the merely rational part of the intellect.

The first step is an immersion in facts to the highest degree as well as all that the senses will tell us. Intuition can not be an excuse for intellectual laziness. The next step is to keep the mind as open as possible. Don't dismiss evidence just because it doesn't make rational sense. (City boys may not *know* that farm animals mostly face away from the wind, but perhaps some part of their minds observed and retained this information.) The upshot may be a strong feeling that a certain ridge will give lift. Keep a track record of how your intuitive feelings make out. We all know of "lucky" people. Often the luck seems to go in patterns. Be aware of the pattern of your own luck, of when things seem to click and when they don't. Finally one day, your logic will tell you to take course A and your intuition course B. At this point, awareness of your track record will make choosing a lot easier. Generally I follow the intuitive guide, myself. Sometimes, long after, I come across the knowledge which explains rationally what my feelings told me to do. I generally fly best when I feel at home and at one with my feelings.

In soaring I think the problem of decision making boils down to a realization of its importance and a conscious plan not to fritter away one's energy on non-productive ones. Too many pilots are mesmerized by skills and gadgets. These are things to take for granted, important without doubt, but too widely shared to be a deciding contest factor. Observation, resolution, action. That's where contest points lie. Of the three, effective, all-encompassing observation seems to me the key. If observation is complete, resolution should be easy, action almost a foregone conclusion.

MAINTENANCE AND PROJECTS

LES SEBALD

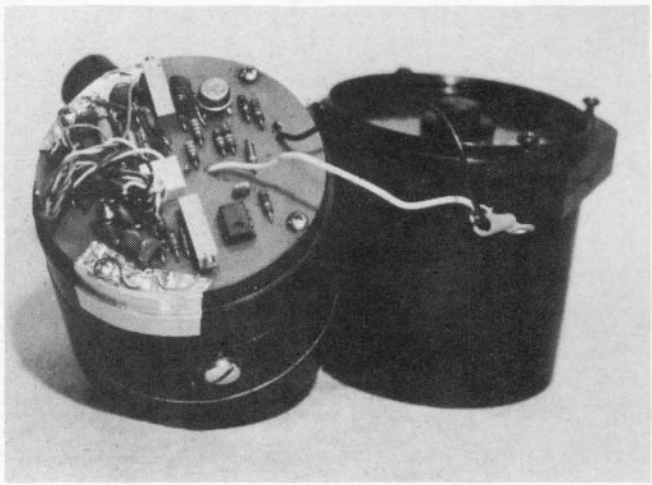
RADIO INTERFERENCE — VARIOS

One of my pet peeves used to be that when I keyed my transmitter, the electronic vario would go ape. Most varios probably do the same thing unless something is done to filter out the radio interference signal. The fix can be pretty simple.

The Ball 400 series instrument is a good illustration of how easy this can be. Gain access to the main circuit board, which holds all of the very sensitive operational amplifiers, by removing the outer screws as shown in the photos. Note that a bundle of wires emerges through the board from the circuits toward the rear of the instrument. The main idea is to install filters in each lead that connects to the outer plug. Several wires in this bundle do not connect to the plug, and they should not be touched.

By freeing the circuit board, it is possible to unsolder each of the plug wires one at a time, and insert a 150 ohm ¼-watt resistor in series with the lead. Solder the resistor to the circuit board where the wire came from, but leave enough lead exposed on top of the board to also solder a condenser lead later on. Solder the removed wire to the other resistor lead. The resistor is now in series with the lead. It may be secured later on mechanically by bending it near a mounted component and adding a dab of silicone rubber. Here are the wires that need the resistors:

Plug pin wire #1 — Purple
#2 — Brown
#3 — Red
#4 — White
#5 — No wire
#6 — Blue
#7 — Black
#8 — Yellow
#9 — Green



Do not touch the orange and orange-white wires and the grey and grey-white wires which connect to the diaphragm inductances.

Once all of the resistors and wires are taken care of, solder one lead of a .001 microfarad condenser to each resistor lead that goes to the circuit board. All of the other condenser leads are to be grounded to the head of one of the screws that secures the circuit board to the frame. See photo. I also added a bit of foil as can be seen to help ground the metallic capacity unit better.

Parts may be obtained from Radio Shack as:
8 each 150 ohm ¼-watt resistors # 271-1312
8 each .001 ufd condensers # 272-126

When done, the unit should be reassembled and installed. No recalibration is necessary.

Note: In case readers of this column wish to contact me, I have a new phone number. (415) 593-8880.

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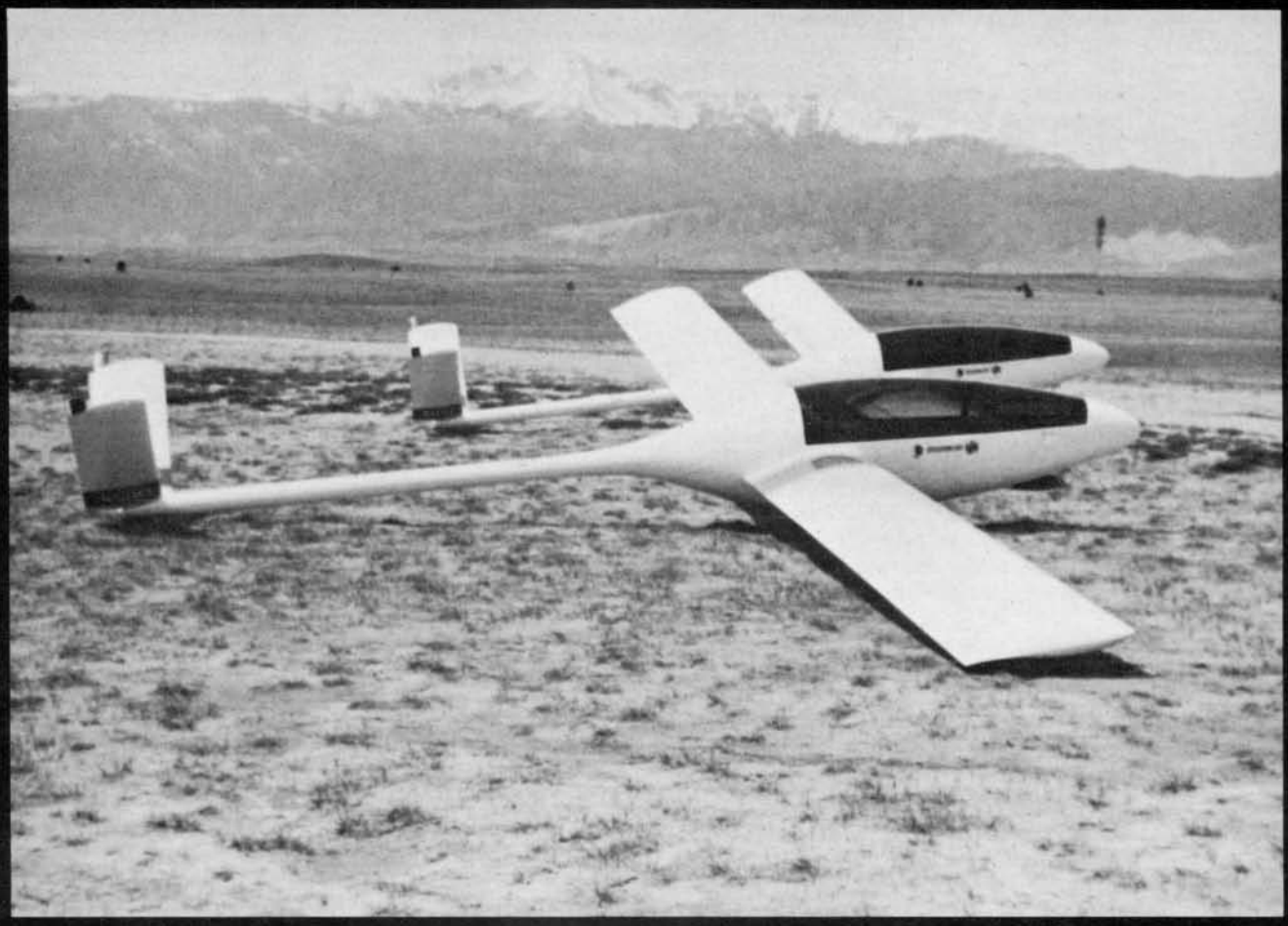

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SAFETY CORNER

ROBERT GAINES

Perhaps it's the nature of the beast. Whatever the reason, we sure have a hard time setting a ship down in one piece at the field. We have too many accidents at the edge of the field. One big reason is that pilots drift off downwind and can't get back.

Guest columnist Larry C. Johnston had been instructing for quite a while. The points he makes are simple and direct. If we follow his teachings we will reduce accidents this year. Thank you, Larry. — ROBERT GAINES, Safety Corner Editor

APPROACHING THE LANDING PATTERN

Landing pattern articles have been published in a number of issues of *Soaring*. Their message mostly concerns what to do after entering the pattern at the local field. But what about the happenings *before* arriving at the Initial Entry Point (IEP)? Some things lead to being too low on final to make the field or to catching a wing on an obstruction, like a fence, tree, or brush at the gliderport.

In one unhappy off-field landing a pilot came to a stop against an old fence post, disturbing a yellow-jacket nest in the process. In a few moments he was in a different kind of wild flight. Don't laugh, I have been told it is a true story.

Having soared from twenty-two different glider operations across the country, I find no consistency in approaches to the IEP — and there really can't be. Gliderports range from wide-open clear 5000-ft. runways to 1800-ft. grass strips surrounded by trees and rocky fields. There is a real need for a better understanding of where we are, wind conditions, and what we are going to do about it as we make our approach.

During my travels, I talk to instructors and operators about training techniques. The one thing I find missing is instruction in "Radius of Action"; how far away can you be from the gliderport considering your ship's optimum L/D, your present altitude, wind conditions, and still make the IEP? Knowing where you are and what you can do will help most pilots get back to the field and especially keep solo pilots from making off-field landings.

It has been said we should go up to 1000 and 2000 feet and "see" how far we can glide with our optimum L/D. At the same time we are to look for outstanding features at those altitudes as reference points and distances to be covered. That's fine, but someone overlooked the fact the IEP is usually 600 to 800 feet to begin with. Also I have flown from gliderports where the rendezvous point ranged from 1000 to 1400 feet, since that AGL was necessary to reach the IEP safely. So, for example, subtracting 800 from 1000 gives a Radius of Action of only 200 feet. *Voilá*! That reduces the allowable gliding distance drastically and probably accounts for many hairy landings and low approaches, if the field is made at all. Think about the windy days when you have been downwind at, say, 1000 feet and heading for the 800-ft. level only to realize you are at 600 feet instead. What do you do now?

Competition pilots generally overlook these statements, as the nature of a meet is to win the day's task and for them to take chances where their experience indicates they can make it. Often they depend on that long L/D glide radius to make it straight into the gliderport for the day's completion. When a pilot goes out for competition or for

a badge distance, he automatically acknowledges he is taking chances and flys accordingly. However, that is not for students, solo pilots, and most weekend pilots.

In the vicinity of the airport I believe it helps to think of being in a cone of action: Consider a shallow upside-down cone with the apex at the runway. The higher up the cone, the farther away you can go, but with wind added, tip the cone into the wind. Now you can quickly visualize that you can go farther upwind but must stay closer downwind.

I encourage my students, while they are practicing airwork, to orient themselves in relation to the gliderport or a possible landing field. Frequently I'll ask, "Where is the airport?" After it is pointed out (or I have to show them), I'll ask, "Can we make it back to the IEP from here, and what speeds do we have to fly?" Incidentally, this was asked of me by the FAA Examiner who gave me my flight test for my instructor's rating. It was a day after a snowstorm and everything was solid white. Luckily, I had spotted the airport a few moments earlier. After pointing it out to him and answering his questions, he replied, "Fine." After I passed the test he said, "I hope you will teach your students to always be aware of the location of the airport, and what they have to do to get back to it."

It is important to know what speeds to fly. Sometimes this is overlooked when you become so engrossed in the lesson's activity or in "just soaring" that you have drifted downwind too far for a safe return. When you realize what happened, all the things you need to know to get straight back home begin to flash through your mind. Fly your aircraft first and cross-check your airspeed for best penetration against the wind. Then check drift and make adjustments to airspeed to give good penetration with minimum sink. (Remembering your ship's performance curves helps at this moment.) While moving along you will be observing possible fields or areas for an off-field landing. Naturally you will be looking for areas of best thermal lift

and avoiding those that add to your sinking feelings: Ah, there's a plowed field; over there is a hay or grain field, nicely cut; yes, that rocky ledge might produce lift; gee, can I make that ridge to gain some help?; oh no, stay away from that tall cornfield; etc.

All this time you are getting closer to home, and if you see you've made it, all is well. If not, plan your off-field landing. As you reach 2000 feet AGL, start searching for that spot. At 1000 feet pick your place, having already noted the wind direction, condition of the field (is it flat, uphill or downhill, does it have obstructions?), availability of a road, wires, and other things you can think of. Select your pattern and make your landing. In this critical time watch your airspeed. Keep well above stalling speed and don't use minimum controllable airspeed in any pattern wherever you are. A sudden wind change or downdraft could make you a crash statistic.

Yes, I've had a few hairy times getting back to the airport, and the foregoing exemplify things that went through my mind, as well as demonstrate to the student what should be done. Fortunately, I have not had an off-field landing and am trying to keep it that way. Besides that, it is expensive to retrieve a glider if you don't own your own equipment.

I believe all this is summarized by saying, "Know your approach and its possible problems; understand your Radius of Action; examine all the areas at your gliderport for lift potential, know where they are and keep them in mind; and know where you are at all times." Doing these things will help you make the Initial Entry Point safely and from there the pattern and landing look good.

ACCENT ON CLUBS

MICHELLE SILVER

Tax-exempt status — a sometimes precarious position: Few clubs have unlimited financial resources. As a result, every dollar is carefully hoarded for buying, maintaining, or repairing club ships and property. In order to channel funds into club resources rather than the coffers of the Internal Revenue Service, many clubs operate as non-profit, tax-exempt organizations. To club members this status may seem assured by virtue of the fact that most clubs are not money-making propositions. "Of course it's non-profit," they say. "And of course it's tax-exempt." *Not necessarily.*

Tax-exempt status for flying clubs can be relatively fragile if *all* the IRS's requirements are not met and adhered to, as the Syrang Aero Club of Syracuse, New York, found out.

SAC, comprised of about 30 members, was recently denied its tax-exempt status when the U.S. Tax Court ruled that the purpose of the club was primarily recreational. The club could not show that it provided educational or charitable services. Although the club maintained that it is organized and operated exclusively for the educational advancement of its members in aviation, the Tax Court ruled in case 73 TC No. 55 (1980) that the club could not meet either the "organizational test" or the "operational test" for tax-exempt status under that provision. The "organizational test" of the IRS requires that a club's bylaws restrict the club's purposes to education, charity, or activities which would otherwise serve the public interest. However, tax-exempt organizations are allowed to be involved, *but only insubstantially*, in activities that do not further these purposes. The "operational test" requires the organization's activities to be those which further these purposes and not, except to an insubstantial part, those which do not further an exempt purpose. An organization must qualify under *both* of these provisions in order to be tax-exempt.

SAC failed the organizational test primarily because its articles of incorporation empowered the club to provide recreational flying for its members. Essentially, the club provides only low-cost airplane rental to its members and no educational services. It has no instructors, provides no classes or supervision of flying, and it offers no public discussions, presentations, or exhibits from which the public may benefit. The Tax Court ruled that unsupervised flying did not qualify as educational advancement because it could lead to deterioration of flying skills!

The club also argued that it operates in the interest of the public because it is comprised of members of the U.S. Air Force Reserve Mission of the 174th New York Air National Guard. Nevertheless, this was not enough to convince the Court that this is not its primary function, although the club acts as a recruitment incentive and provides aerial assistance to the Mission. In addition, the Court said, the club has another substantial non-exempt purpose: the club operates for the private interests of its members, thus failing the operational test as well.

Soaring clubs which offer limited or no instruction, and do not engage in activities which benefit the public, could find themselves losing their tax-exempt status on the basis of this ruling and, as a result, could be liable for back taxes under the statute of limitations.

HOME-BUILDERS' HALL

STAN HALL

FLYING THE HOMEBUILT MOBA-2C

SOARING'S Homebuilder News for March, 1980, shows a photo of Gary Sunderland's MOBA-2C, now completed and flying. Readers of this column will recall an earlier report on the design and construction process in the September 1977, and June 1978, issues of SOARING

As Editor Doug Lamont stated in the text accompanying the photo ". . . there was no other communication beyond a laconic scribble on the back" [of the photo]. Because the machine is so beautiful, Doug decided to publish the photo anyway, lack of supporting information notwithstanding.

The rest of the MOBA-2C story is now in hand. Apparently, Gary would rather build and fly than write (who wouldn't?). Anyway, here's the backup to the photo, as written by MOBA-2C's designer and builder, Gary Sunderland of Heatherton, Australia. — STAN HALL

Basic Sailplane Configuration

The MOBA-2C is a 15-meter span, homebuilt, one-off sailplane. It has a basic metal structure of aluminum alloy covered with foam and fiberglass.

Features of the MOBA-2C are the top-located, untwisted, three-piece wing with simple flap and a unique one-piece sliding nose cone whose acrylic canopy forms an integral part. The design also includes a side stick in place of a normal central control column.

Weights and Wing Loadings

Pretest weighing revealed an empty weight of 581 pounds (260kg), which was heavier than originally calculated. This was not unexpected since no allowance was made in the calculations for the added weight of the epoxy glue and polyester filler used in the final stages of construction.

As most of this added weight was in the wings, a higher gross weight was permitted since the added wing weight served to reduce the wing bending moments. This yielded a maximum permissible all-up weight of 796 pounds (361 kg), which gives a wing loading of 8.15 lbs./sq.ft. (39.8 kg/sq.meter).

The initial flights, however, held the wing loading to 7.7 lbs./sq.ft. (37.8 kg/sq.meter).

Initial Flights

Because the side-stick control was exhibiting fairly high friction, the first flight was approached with some caution, particularly in view of the moderately high wing loading.

We need not have worried. The sailplane proved exceptionally stable and well-behaved, although the elevator friction and aileron loads were unacceptably high. Subsequent design modifications (described later) cured these problems.

The glider's low-speed characteristics are particularly docile, despite the wing loading. Flaps-up stall speed is only 40 knots, and the glider does not pitch or drop a wing.

The MOBA-2C utilizes the Wortmann FX-67K-150 wing profile throughout, except for a short faired section which culminates at the tip with the Wortmann 60-126. This choice of airfoils, along with the particular wing planform used, may partially explain the machine's good low-speed properties. Also, I would expect the high placement of the wing to contribute to the performance in this flight regime.

Aileron control remains positive into the stall. It is possible to roll the glider either way and back at 40 knots while maintaining full up-elevator.

Rudder-induced yaw in the stall causes the aircraft to enter a spiral dive, with a rapid speed build-up. The airspeed reaches 75 knots after one-half turn, and 100 knots at three-quarters turn. The speed can be controlled by rolling out with aileron or by lowering flap. Opposite aileron against the turn rapidly overcomes "pro-spin" rudder.

At 4-degrees flap the minimum speed is 37 knots. At full flap (80 degrees) the stall occurs below 30 knots. The flap selection does not include negative settings, as will be explained later.

Best circling speed is 45 to 50 knots, depending on the thermal. Airspeed calibration has yet to be checked but seems to be accurate, as confirmed by flying with other aircraft. The static rake is mounted forward of the fin and should be accurate.

The rate of roll from 45 degrees in one direction to 45 degrees in the other is 3-3½ seconds.

Reworking the Aileron Circuit

As mentioned earlier, the aileron control forces during the initial flights were much too high for comfort and it was necessary to alter the side-stick leverage and travel. Also, some rubbing occurred at the aileron shrouds. This friction was mostly removed; both fixes decreased the control stick loads.

The side-stick controller runs in teflon bearings and these require a certain amount of use to remove "stiction." After 40 hours of flying these are now worn in and the side controller loads can now be described as light.

Vision and Ventilation

Visibility is good; the nose position is just on the horizon at normal flying speeds. There is no break or obstruction in the canopy almost back to the wing leading edge.

Cockpit ventilation depends upon an unusually large (4-inch diameter) nose intake. Ventilation is provided at the front of the canopy and adjacent to the pilot. This has proven adequate even on the hottest of days. I usually close the vent adjacent to the pilot above 5000 feet and the front vent above 8000 feet.

The pressure is such that there is plenty of air leaking past the closed front vent to prevent fogging of the canopy. In extreme conditions one can open the canopy by merely sliding the complete nose forward. This yields a means of direct vision and the loads involved in doing this are very light; not measurably more than opening the canopy on the ground.

The nose canopy does not tend to move about in flight and will stay in the position selected. Opening the canopy about an inch is noisy but still quite comfortable; two inches of opening is rather drafty. Flight tests were performed up

to 80 knots with the canopy open. There is slightly more tail buffet noticeable during flaps-up stalls with the canopy open, otherwise no change. Sideslips and directional stability with canopy open are unaffected.

With the canopy closed, but not yet completely sealed, there seems to be no flow into or out of the top. There is some flow into the cockpit underneath the wing leading edge, roughly level with my shoulders. It is presumed that the air is flowing *out* of the cockpit underneath the seat, as this is the only available exit.

Stability and Trim

Stability is good and the machine has been flown hands-off in turbulence, thermals, and on landing approach. However, the elevator trim is ineffective and will have to be improved, mainly to trim out on aerotow.

High-speed flying has been confined to the present permit limitation of 100 knots with no problems except a left-wing-heavy tendency which will also have to be corrected.

Landing

With full flap and a speed of 50 to 55 knots, the sailplane has a good nose-down attitude. Close control of speed is required on the approach as it is easy to build up airspeed (even with full flap) and the glider tends to float before touchdown. Some additional means of increasing the drag would be useful for landing in small fields.

After touchdown the stick needs be held forward to prevent a wing dropping. The ailerons then remain effective, and it is not necessary to raise the flaps to maintain aileron effectiveness as required on some other sailplane types. Landing in the full tail-down attitude usually results in a dropped wing — and a ground loop.

Landing flap loads at the control handle are low at 50-55 knots airspeed, building up rapidly to 20-30 pounds (10-15 kg) at 65 to 70 knots. The sailplane is equipped with a simple lever to actuate the flaps. No gearing is involved.

Design Origins

As indicated in the September 1977 "Homebuilders' Hall," there were actually three MOBA-2 designs. These three designs represented an ultimately successful, although sometimes frustrating, attempt to salvage something from years of trying to meet the unforeseen changes in design requirements of the FAI and the Australian Gliding Federation.

The first of these attempts, MOBA-2A, was designed around the requirements of the ill-fated Australian Gliding Federation Design Contest of 1972. As a spur to homebuilding and, perhaps, to encourage sailplane building in Australia on a commercial basis, the Federation's basic design requirement was for a 13-meter machine capable of being built by amateurs in a small workshop with limited tools and facilities. The competitors were to submit paper designs, including performance and strength calculations. The rewards to the winner were attractive: the winning sailplane would be constructed by an Australian firm and given to the designer along with $1000 donated by the Royal Aeronautical Society.

Two years earlier, in 1970, the FAI Gliding Standard Class Committee announced a rule change to allow simple wing flaps. Flapped sailplanes were to be introduced in the 1974 World Championships and, the FAI said, no other alterations in the Standard Class rules would be made for some considerable time. Consequently, the Australian design competition officials encouraged that we design our entries around the FAI rules. The prototype PIK-20 and the original LS-2 were designed to these rules. And so was my MOBA-2A.

After 18 months of engineering work, I submitted my design. Six months or so later the contest judges narrowed the selection to my MOBA-2A and one other design. Then, unaccountably, the contest was called off, and 19 designers were left holding the bag. It looked as though the only way MOBA 2 would be built would be to do it myself, so in 1974 the materials were purchased and I started construction.

The next blow was worse. The FAI Committee reversed the Standard Class Rules and they once more prohibited camber-changing flaps. A new racing class was announced of 15-meter span with no other restrictions.

By this time I had just about enough of these vacillating committee decisions. While a sailplane designed to the new 15-Meter Class was obviously going to be better than one designed to the 1974 rules, I had now spent four years designing and redesigning. For this reason I decided to press on with construction of MOBA-2 without any more changes.

Another reason for building the MOBA-2 as originally planned was a personal one. Grapevine information said that some judges of the 13-meter contest alleged that my MOBA-2B contained "serious design deficiencies" and that the prizes had not been awarded for this reason. Therefore I determined to build the glider as close as possible to the 13-meter contest entry and thereby prove the design should have been eligible, at least, for the $1000 cash prize offered by the Royal Aeronautical Society to the winner of the contest.

The MOBA-2C I'm flying now is therefore the same as the 13-meter MOBA-2B design contest entry except the wingspan is increased to 15 meters, the fin and rudder are increased in height, and the rudder is fabric rather than metal-covered.

A word about the origins of the MOBA-2C flap design. One of the facts of life in designing a sailplane with a simple

flap is that when the flap is deflected there is a discontinuity in the lift at the ends of the surface. This results in increased wing drag and expected benefits of having a camber-changing flap may not necessarily be achieved.

In the LS-2, in which the flap takes up most of the wing trailing edge, only short ailerons are possible. Consequently the original LS-2's roll rate suffered.

The MOBA-2 basic design carried flaps only 20 feet in length, the remaining span being taken up by ailerons. The PIK-20 flap length represented a mean between the LS-2 and the MOBA-2.

To compensate for the drag increase due to flap deflection, the MOBA-2C wing was given an aspect ratio of nearly 25 as against somewhat less for the PIK-20 and the LS-2. This high aspect-ratio, which carried a characteristic weight penalty, coupled with a fairly small wing area, gave the MOBA-2C a high wing-loading. It was reasoned, therefore, that negative flap deflection would not be necessary when cruising between thermals.

Performance

Since MOBA-2C was designed to earlier FAI rules, it is not surprising that its performance is not quite up to that of the latest in the racing class. However, I was quite pleased to have the opportunity to fly the machine in the 1980 Australian Championships at Benalla and compare its performance with that of the highly competitive racing class field.

The performance of MOBA-2C appears to lie somewhere between current Standard Class and 15-Meter Class sailplanes. The calculated best glide ratio of 38 seems to have been achieved.

I had flown some 16 hours on test prior to the Championships and, during the contest, was able to complete another 24 hours. Cross-country distance flown in the aircraft totals 2257 kilometers to date. This includes a 400-kilometer triangle completed at 95 km/hr.; good only for last place in the 15-Meter Class but not bad for an out-of-practice pilot.

Thermaling performance of MOBA-2C compares well with Standard Class gliders. This is not surprising because the 15-Meter Class gliders generally were flying 100kg heavier. They consequently thermaled at 55 knots and with a larger radius of turn than I wanted to use. Between thermals the 15-Meter Class sailplanes flew noticeably faster, with about the same glide angle as MOBA-2C. When 8 to 10-knot thermals were available the usual interthermal speeds were 80 knots for MOBA-2C and 90 to 100 knots for the 15-Meter Class aircraft.

The overall performance was not all that different. Far more significant to actual contest scores achieved in the MOBA-2C were the operational problems encountered in flying without dive brakes and with the flying ability of the pilot. From my experience with MOBA at this contest I deduce that the current 15-Meter Class sailplanes are easier to fly and more efficient than sailplanes designed to the earlier FAI rules. But then, they are also more complicated and expensive.

Operation

The MOBA-2C has proven to be a very practical sailplane in ground handling. We had two outlandings and road retrieves and de-rigged with two people. The wingtips weigh 75 pounds (34kg) each and are easy to handle. The center section weighs 188 pounds (85kg) and can be lifted off the fuselage by two men. Large wheels fitted to one end of the center section facilitate moving it to the trailer. The center section rolls into tracks in the roof of the trailer.

Gary Sunderland

The only mechanical problem experienced during the Championships involved the old converted motorbike *Libelle* wheel, which failed during landing in a plowed field. The wheel was replaced later with the current "Tost" *Libelle* wheel.

Questions and Answers

The following most common questions are given with my replies:

Q. How much did it cost?

A. About $4000 for materials at 1974 and 1975 prices. Possibly that could be doubled now to allow for inflation.

Q. Who made the canopy?

A. It was originally for a *Kestrel* sailplane, as supplied uncut.

Q. What is the inclined seating like?

A. For a short flight I would prefer the normal, more upright seating position, but for a long flight it is very good. After five hours I had absolutely no soreness in the back or bottom.

Q. What is it like to fly with the side stick?

A. Very easy and natural for a couple of hours. After this time the right hand starts to get tired, particularly the thumb. The advantage of a central stick is that you can swap hands, or fly with both hands in turbulence. You can also use the weight of your arms to assist rolling the glider into thermals, probably without thinking about it. Before building MOBA-2 I had a lot of flying in a power plane which also had a side stick. I now think this is not comparable. You don't have to constantly maneuver a power plane for hours as you do a sailplane. I conclude that the side stick is not a help to piloting although it makes the control system easier to build.

Q. How do you get out?

A. The same way you get in. The nose slides forward 50cm (20 inches) for normal opening. In an emergency the pilot is provided with an operating cable which opens the canopy even more to a point past the instrument panel where the nose cone comes off the slides and jams open. As noted before, the canopy operating loads are quite low.

Q. How many hours did it take to build it?

A. I have no idea. It took most of my spare time for six years to build; four years of design effort before that.

Q. Would you do it again?

A. No! I am glad to have had the experience of completing the project, and I am very pleased with the result. In the near future I plan to do a lot more flying.

Q. Are plans available?

A. No. These would take a bit of effort to organize and I have other things to do. As I said, I want to get some flying done now.

F.A.I. BADGES

CINDY BRICKNER

INTERNATIONAL F.A.I. BADGES FOR SOARING

Earned or Recorded in the United States Through March 1980

DIAMOND BADGES

458. Susan C. Grosek

GOLD BADGES

1284. Dennis A. Reynolds
1285. Bjorn F. Floden
1286. Lloyd Leo Root

SILVER BADGES

3832. Michael C. Downs
3833. Michael W. Arensmeyer
3834. James J. Harkins, Jr.
3835. George C. Boudreaux II
3836. Steven H. Paavola
3837. James A. Merciel, Jr.
3838. Paul Janak

ALTITUDE DIAMONDS

5000-meter gain (16,404-ft.)

David E. Blubaugh; Lark; Black Forest, CO
John F. Detwiler; PIK-20; Estrella, AZ
Robert Ferguson; 1-26; Black Forest, CO
Peter F. Flanagan; Lark; Black Forest, CO
(Certified to Canada)
Susan C. Grosek; Jantar 2; Estrella, AZ
Larry A. Kirkbride; 1-26; Minden, NV
G. David Ledford; 1-26; Minden, NV
John R. Lovett; 1-34; Black Forest, CO
Klaus Meyer; 2-32; Black Forest, CO
(Certified to West Germany)
Daniel W. Nezgoda; Pilatus; Minden, NV
Philip Purdy; 2-32; Black Forest, CO
(Certified to Great Britain)
Lloyd L. Root; 1-34; Minden, NV
Ruth A. Stevens; 2-32; Boulder, CO
Robert L. Thomas; 2-32; Black Forest, CO
Donald G. Toepel; PIK-20; Wenatchee, WA

DISTANCE DIAMONDS

500 kilometers (310.7 miles)

Gary Adams; 311 miles from Ridge Soaring, PA; AS-W 20; 5:00 hrs.; April 6.
Rolf Algotson; 311 miles from Ridge Soaring, PA; 1-35; 5:45 hrs.; April 5.
(Certified to Sweden)
Bela Kasco; 311 miles from Ridge Soaring, PA; Libelle; 5:12 hrs.; April 5.
(Certified to Canada)

GOAL DIAMONDS

300 km O&R or Triangle (186.4 miles)

Rolf Algotson (See Dia. Dist.)
Bela Kasco (See Dia. Dist.)

GOLD BADGE LEGS

Altitude: 3000-meter gain (9842-ft.)

Kazunori Asamiya; 1-34; Black Forest, CO
(Certified to Japan)
David E. Blubaugh (See Dia. Alt.)
Harry D. Brown; 2-32; Black Forest, CO
Roger D. Caldwell; AS-W 20; North Adams, MA
Roy L. Doyal; 1-26; Moriarty, NM
Christopher Eaves; 1-34; Black Forest, CO
(Certified to Canada)
Robert Ferguson (See Dia. Alt.)
Peter F. Flanagan (See Dia. Alt.)
Bjorn F. Floden; 2-32; Black Forest, CO
Ian Godfrey; 2-32; Black Forest, CO
(Certified to Great Britain)
Richard J. Hausman; 1-34; Black Forest, CO
Francis A. Hayes; Cirrus; Marion, NC
Gregory F. Heifner; Lark; Black Forest, CO
Anthony G. Lauck; 1-26; North Conway, NH
James A. Merciel, Jr.; 2-32; Black Forest, CO
Donald Miles; 2-32; Black Forest, CO
Terrence E. Miller; 1-34; Black Forest, CO
Daniel W. Nezgoda (See Dia. Alt.)
I.B. Overgaard; 1-34; Black Forest, CO
(Certified to Denmark)
Charles A. Paldanius; 1-26; USAF Academy, CO
Roland G. Preister; PIK-20; Estrella, AZ
(Certified to West Germany)
Edgar Rasper; PIK-20; Estrella, AZ
(Certified to West Germany)
Dennis A. Reynolds; Libelle; Moriarty, NM
Judith J. Rose; 1-26; Black Forest, CO
Lloyd L. Root (See Dia. Alt.)
Edward F. Ryan; 1-34; Black Forest, CO
Chuck Snyder; 1-34; Minden, NV
Frits C. Stevens; 2-32; Black Forest, CO
(Certified to Canada)
Ruth A. Stevens (See Dia. Alt.)
Robert L. Thomas (See Dia. Alt.)
Edward C. Thunen; Blanik; Minden, NV
Robert N. Whittemore; 2-32; Black Forest, CO
Barry L. Wible; Lark; Black Forest, CO
Raymond Zinkowski; 1-26; Moriarty, NM

SILVER BADGE LEGS

Altitude: 1000-meter gain (3281-ft.)

Harry D. Brown (See Gold Alt.)
Don Chambers; Sunbird Nova; San Fernando, CA
Maurice G. Deland; 1-26; Ridge Soaring, PA
Charles F. Dewald; Ka-8; Frederick, MD
Andrew Durbin; SGS; Estrella, AZ
(Certified to Great Britain)
Robert Ferguson (See Dia. Alt.)
Paul Janak; 1-34; Estrella, AZ
Robert L. McClellan; 2-33; Ridge Soaring, PA
James A. Merciel, Jr. (See Gold Alt.)
Friedrich-Wilhelm Schulte; 2-33;
Ridge Soaring, PA
(Certified to West Germany)
William H. Walton, Jr.; 1-26; Ridge Soaring, PA

Distance: 50 kilometers (31.1 miles)

Michael W. Arensmeyer; 1-34; Estrella, AZ
George C. Boudreaux II; 1-26; Estrella, AZ
Bernard P. Bower, Sr.; 1-26; Ridge Soaring, PA
James J. Harkins, Jr.; 1-26; Estrella, AZ
Paul Janak; 1-26; Estrella, AZ
Stephen H. Paavola; Libelle; New Braintree, MA
Mark A. Summers; Cirrus; Livermore, CA

Duration: 5 hours

Michael W. Arensmeyer; 1-34; Estrella, AZ
Don Chambers; Sunbird Nova; Torrey Pines, CA
Paul Janak; 1-34; Estrella, AZ
Frank D. Thompson; Libelle; Miami, FL

Altitude/Distance

Kevin G. Dunshee; 1-26; Estrella, AZ

Altitude/Duration

David E. Blubaugh (See Dia. Alt.)
George C. Boudreaux II; 1-26; Estrella, AZ
Charles A. Paldanius (See Gold Alt.)
James F. Pletcher, Jr.; 1-26; Ridge Soaring, PA
John E. Pollard; 1-26; Chester, SC

Altitude/Distance/Duration

Michael C. Downs; 1-34; Estrella, AZ

C BADGES

60-min. flight

10,380. Henry E. Mangels
10,381. John A. Couch
10,382. Tom Chumky
10,383. Edith Decker
10,384. Roy L. Doyal
10,385. Charles Fink
10,386. Bernd Gausterer
10,387. Richard W. Gray
10,388. Brian Harper
10,389. Louis Y. Hoffman
10,390. John L. Hooker
10,391. James G. Keller
10,392. Ingo Kuenzel
10,393. Mark MacKenzie
10,394. Boyd R. Phelps
10,395. Homer Phillips
10,396. Daniel R. Proctor
10,397. Jerry L. Proctor
10,398. Michael T. Rapp
10,399. Harold Ruffin
10,400. Rick Stone
10,401. Joachim P. Stuart
10,402. Frank R. Trowbridge
10,403. Fredric P. Weitz
10,404. Ernest P. White, Jr.
10,405. Thomas H. White

B BADGES

30-min. flight

Harry Abbott
William Byrd
Glenn D. Collins
Edith Decker
Charles Fink
Bernd Gausterer
Bruce R. Gray
Richard W. Gray
Robert W. Gray
W.J. Herbert
John L. Hooker
James Keller
Judy Luscinskas
Mark MacCaulay
Guy Morin
Karrie Pennington
Boyd R. Phelps
Homer Phillips
Daniel R. Proctor
Paul E. Proctor
Michael T. Rapp
William A. Ray
Harold Ruffin
Howard O. Sears
Joachim P. Stuart
Jacob Tagert
John W. Thompson
Frank R. Trowbridge
Thomas H. White
Russell D. Willis
Donald Wyatt

RECORDS APPROVED

National/State Feminine; Single-place; Out & Return; 621.5 mi. (1000.868km); Doris Grove; AS-W 19; March 11; Julian, PA

Colorado; Single-place; Sr.; Speed Over a 100-km Triangle; 51.6 mph; Steven Wandzura; 1-34; September 9; Colorado Springs.

Colorado; Multiplace; Open; Distance/Goal; 242 mi.; Bruce Miller; 2-32; September 5; Boulder.

New Mexico; Single-place; Jr.; Alt./Alt. Gain; 23,500 ft./11,000 ft.; Roy L. Doyal; 1-26; February 23; Moriarty.

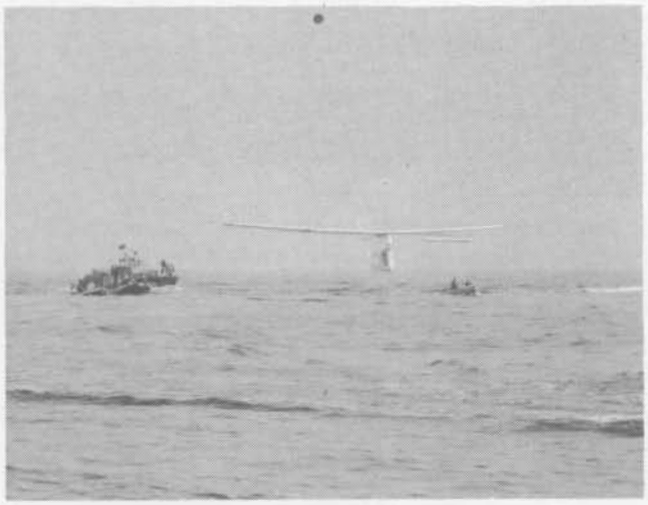
RECORDS CLAIMED

World/National/State; Feminine; Single-place; Out and Return; 636.9 mi. (1025.023km); Cornelia M. Yoder; AS-W 19; April 5; Port Matilda, PA.

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 evening (daily during major contests). The recording may be heard by dialing (213) 390-4440 between the hours of 5:00 p.m. and 8:00 a.m., Los Angeles time, and all day on weekends. To reach a staff member who might be in the office during these hours, please call (213) 390-4447.

CALENDAR OF EVENTS



Contests listed in bold-face type are sanctioned by SSA

May 30-June 1, 25th Anniversary Meet and Dinner Dance of the Long Island Soaring Association. Contact Mary Jane Glenn, 6 Broadhurst St., Port Jefferson Station, N.Y. 11776. (516) 928-1647.

June 1-7, National Soaring Week. Contact John Lee at SSA for assistance in planning local activities. SSA, Box 66071, Los Angeles, Calif. 90066.

June 7-8, 4th Annual Sportsman & Amateur Soaring Meet. Contact Aero Soaring Club, Dart Airport, P.O. Box 107, Mayville, New York 14757. (716) 753-2112.

June 9-13, Region 10 Contest, Marfa, Texas. Contact Fritz Kahl, Box 1047, Marfa, Texas 79843.

June 14-15, "Task Days," Ridge Soaring, Julian, Pa. Contact Ridge Soaring, Inc. (814) 355-1792.

June 14-15, Kremmling Camp, Kremmling, Colorado. Contact Roy Scott, (303) 499-2120 home or 441-4461 work.

June 17-26, 5th U.S. National 15-Meter Class Soaring Championships, Springfield Municipal Airport, Springfield, Ohio. Contact Tom Stoops, 3741 Silver Oak St., Dayton, Ohio 45424. (513) 236-1463.

June 23-27, Region 8 Contest, Ephrata, Washington. Sponsored by the Seattle Glider Council. Contact John Sager, 240 SW 183rd St., Seattle, Washington 98166. (206) 246-5225.

June 28-29, 4th Annual Great 1-26 Sailplane Race, Fun Country Soaring, Wellington, Ohio. Contact Ray Malloy, 15309 London Ave., Cleveland, Ohio 44135.

June 28-30, July 1-4, Region 12 Contest, Bishop, California. Sponsored by the Bishop Soaring Club. Contact Adriaan Schat, 120 Mandich, Bishop, California 93514. (714) 873-6311.

June 29, 50th Anniversary of Soaring Banquet, Elmira College, Elmira, New York. Contact National Soaring Museum, Harris Hill, RD #3, Elmira, N.Y. 14903. (607) 734-3128.

July 1-10, 11th U.S. National Standard Class Soaring Championships, Harris Hill, Elmira, New York. Contact Shirley Sliwa, %NSM, Harris Hill, RD #3, Elmira, New York 14903.

July 2, Commemorative Flight — An Official U.S. Glider Mail Flight, Harris Hill, Elmira, New York. Contact National Soaring Museum, Harris Hill, RD #3 Elmira, N.Y. 14903. (607) 734-3128.

July 4-6, 12th Annual Soaring Fun Meet, Parlin Field, Newport, New Hampshire. Hosted by Kearsarge Soaring Assn. (10th Anniversary Year). Contact Harold F. Smith, Crocketts Corner, New London, N.H. (603) 526-4219.

July 4-6, Sportsman Contest, Hinckley, Illinois. Contact Al Freedey, 754 N. Gladstone, Aurora, Illinois 60506.

July 4-6, Westcliffe Camp, Westcliffe, Colorado. Contact Fred Lidinsky, (303) 421-9001 home or 425-5049 work.

July 4-6, Socorro Camp, Socorro, New Mexico (tentative). Contact Roy Scott, (303) 499-2120 home or 441-4461 work.

July 5-13, 3rd Annual SSA Vacation Derby from San Antonio, Texas, to Hobbs, New Mexico, by way of Odessa, Marfa, and Big Spring. Soar historical skies. Contact John Lee, SSA, Box 66071, Los Angeles, Calif. 90066. (213) 390-4447. (See March 1980 *Soaring*)

July 9-19, Canadian National Soaring Championships, Claresholm Airport, Claresholm, Alberta, Canada. Contact Rick Matthews, 3 Westwood Drive S.W., Calgary, Alberta, Canada. T3C 2V6. (403) 263-7670 business, (403) 242-4726 home.

July 11, Friday, SSA Directors' Summer Board Meeting, National Soaring Museum, Harris Hill, Elmira, New York. For information contact SSA, P.O. Box 66071, Los Angeles, Calif. 90066. (213) 390-4447.

July 15-24, 47th U.S. Open Class Soaring Championships, Hobbs, New Mexico. Contact Jack Gomez, 310 W. Taylor St., P.O. Box 831, Hobbs, New Mexico 88240. (505) 393-3252.

July 17-24, 1-26 National Championships, Ionia, Michigan. Contact Jerry Benz, 260 E. Main, Saranac, Michigan 48881. (616) 642-9019.

July 19-20, "Task Days," Ridge Soaring, Julian, Pa. Contact Ridge Soaring, Inc. (814) 355-1792.

July 19-27, National Aviation Space Education Convention, Florida Institute of Technology, Melbourne, Florida, and the NASA Kennedy Space Center. Write: American Society for Aerospace Education, 1750 Pennsylvania Ave. N.W., Washington D.C. 20006.

July 26-27, Leadville Camp, Leadville, Colorado. Contact Dave Johnson, (303) 495-4177 or Herb Hast, (303) 288-1515.

July 26-Aug. 3, 5th Annual Sun Valley Regatta, Hailey Airport, Idaho. Contact Klaus or Joyce Ansorge % Condor Sky Sailing, Box 1101, Hailey, Idaho 83333.

July 27-Aug. 3, Eighth International Vintage Glider Rally, Sutton Bank, Yorkshire, England. Contact Vintage Gliding Club of Great Britain, 60 Well Road, Oxford, Kent, England.

Aug. 11-15, Tenth Annual South Region 5 Contest, Cordele Airport, Cordele, Georgia (bid subject to approval). Contact Bob Grey, 200 Grey Creek Drive, Athens, Georgia 30606. Phone, business (404) 549-6988 or home (404) 548-1805.

Aug. 16-17, Crested Butte Camp, Crested Butte, Colorado. Contact Roy Scott, (303) 499-2120 home or 441-4461 work.

Aug. 24-29, Region 6 Contest, Ionia, Michigan. Contact Jerry Benz, 260 E. Main, Saranac, Michigan 48881. (616) 642-9019.

Aug. 27-Sept. 1, SSA's 2nd Annual Women's Soaring Seminar, Ridge Soaring, Inc., Julian, Pennsylvania. Contact SSA, P.O. Box 66071, Los Angeles, Calif. 90066. (213) 390-4447.

Aug. 29-Sept. 1, 2nd Annual SSA Homebuilders Workshop, National Soaring Museum, Harris Hill, Elmira, New York. Contact John Lee, SSA, Box 66071, Los Angeles, Calif. 90066. (See March 1980 *Soaring*).

Aug. 30-31, Sept. 1, "Task Days," Ridge Soaring, Julian, Pa. Contact Ridge Soaring, Inc. (814) 355-1792..

Aug. 30-31, Sept. 1, Black Forest Labor Day Contest, Black Forest Gliderport, Colorado Springs, Colo. Contact Sam, (303) 495-4144.

Sept. 6-7, Joint Aviation Committee Air Show, Chemung County Airport, Elmira, New York. Contact National Soaring Museum, Harris Hill, RD #3, Elmira, N.Y. 14903. (607) 734-3128.

Sept. 13-14, Central Ohio Soaring Association Annual Fall Roundup. Marion, Ohio. Contact Karlee Lemley, 5288 Butternut Ct. W., Columbus, Ohio 43229. (614) 888-1987.

Sept. 19-21, Creede Camp, Creede, Colorado. Contact Dick Gray, (303) 781-8675 home or 388-4836 work.

Oct. 4, Commemorative Flight of Wolf Hirth — Elmira to Binghamton. Contact National Soaring Museum, Harris Hill, RD #3, Elmira, N.Y. 14903. (607) 734-3128.

Oct. 11-12, Fall Foliage Festival sponsored by the Harris Hill Soaring Corporation. Harris Hill, Elmira, New York. Contact National Soaring Museum, RD #3, Elmira, N.Y. 14903. (607) 734-3128.

Nov. 28-30, Snow Bird Soaring Contest, Harris Hill, Elmira, New York. Contact National Soaring Museum, RD #3, Elmira, N.Y. 14903. (607) 734-3128.

May 24-June 7, 1981, 17th World Gliding Championships, Paderborn-Haxterberg, West Germany. Contact SSA, P.O. Box 66071, Los Angeles, Calif. 90066. (213) 390-4447.

May-June 1981, SSA World Soaring Championship Tour including visits to sailplane factories. Contact John Lee, SSA, Box 66071, Los Angeles, Calif. 90066. (See March 1980 *Soaring.)*

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: Lianna Lamont

SOARING Magazine
Box 66071
Los Angeles, Calif. 90066

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SAILPLANES FOR SALE

PIK-20B. Carbon fiber spars, trailer, extras. (904) 258-7110 days, (904) 673-1392 eves. or (904) 253-5351.

PIK-20D, excellent condition. Ball varios with netto/cruise control. Schuemann box. No radio, no trailer. $19,900. (213) 398-9733.

PIK-20D, contest ready, with Schuemann TE compensator on a Cambridge vario, 2¼" Winter netto, 360-channel Bertea, Eudurox oxygen, factory trailer. 150 hrs. T.T., fresh annual. $20,000. (303) 825-1394 days, (303) 756-3985 eves.

PIK-20D, demonstrated performance in competition. Full panel except radio. Metal trailer. $19,900. (313) 761-5481.

DG-100, 100 hrs. T.T. Full instrument panel, radio, oxygen, parachute, and enclosed trailer. $17,000. (415) 897-6171 days, (415) 892-2007 evenings.

DG-200, 15-Meter Class, built in '78-'79, 80 hrs. T.T. 32 happy landings, never damaged. Good-looking and well-instrumented cockpit, includes enclosed trailer. Delivered from Bremerhaven. West Germany, to any point in the U.S.A. $40-44,000. Contact G. Duke Duncan, 568 A Wakefield Drive, Charlotte, North Carolina 28209.

SKYLARK 4. Instruments with Ball and PZL varios, T.E. probe in fin, enclosed trailer, oxygen, parachute, new canopy, internal antenna. Annual through May 1980. Canadian registration, C-GDXN. Excellent condition. (613) 584-3835.

DART, 17-METER, retractable, in excellent condition. Fully equipped for Diamonds. Enclosed trailer, Baysides, oxygen, audio, barograph, and chute. Best performance buy. Available, $10,-000. Chuck Rockhold, (801) 363-9238.

DIAMANT 19, winner of the 1977 Region 11 Open Class. Metal trailer, instruments, oxygen, water ballast. Cleanest Diamant you've ever seen. Best offer. Ray Poquette, (916) 273-6516.

DIAMANT 16.5, one-third interest. Fully instrumented, radio, oxygen, water, chute, metal trailer. Contest-ready, S.F. Bay Area based. $4000/B.O. (415) 881-0597.

DIAMANT 16.5. Full instrument panel, radio, water ballast, trailer. (213) 985-5615.

DIAMANT 16.5. Low time, excellent condition. Latest modifications incorporated. Special limitations lifted. (215) 644-5322.

PHOEBUS B-1, 630 hrs. T.T., not flown since complete new gel coat by Jiran. Enclosed aluminum trailer with brakes by Jiran. Two varios, 360 NAV/COM, oxygen, water ballast bags. Former Region 12 champion, absolutely first class. $12,000. Hayden Harris. (313) 663-3213 days, (313) 475-1139 nights.

PHOEBUS B. Complete X-C package. Enclosed trailer, Schuemann T.E., 2nd vario with audio, radios, oxygen, g-meter, barograph, chute, cameras, etc. $11,500. (412) 283-5223.

15-METER SAGITTA. Complete X-country equipment, covered trailer, U.S. ATC. Has slight warp in left wing, but flies great. $4500 or best offer. (916) 243-7700 days or (916) 221-1818 eves.

THE ONE AND ONLY ELFE PM-3, 16-meter wooden classic Swiss sailplane. Joe Personett, (915) 584-5938.

JAVELIN J-4. Good condition, low time. No trailer. (612) 854-6606.

DUSTER complete kit, half done and signed off. Bench and trailer included. Very reasonable. Southwest Michigan, (616) 429-9007.

DUSTER, N11BJ with 2 varios w/audio, radio, chute, and open trailer. John Newman, (209) 734-4451.

BJ-1B DUSTER. Complete kit, fiberglass, and plans. Not started. (209) 957-9186.

MONERAI KIT, spars finished, some welding done. (714) 753-4966 eves.

TERN I-A, N1723, 51-ft. span, honest 34:1, wood/fiberglass construction. Epoxy adhesive used throughout. Basic instruments, chute, trailer. Never damaged, needs some work, cleanup, and painting for relicensing. $2995. (714) 436-3966.

BG-12BD, excellent condition, complete instruments, oxygen, radio & parachute. Buck Davis, (805) 488-5211.

BG-12BD, GOOD CONDITION. Standard instruments, Ball electric w/audio, oxygen, chute, and excellent enclosed metal trailer. $4800. Call Al Weymouth, (209) 486-7240 days, or 291-7812 eves.

RS-15, serial #1. Built by Schreder. Winner Region 12 Sports Class. Interconnects, water ballast, basic instruments. Enclosed aluminum trailer. Tom Madigan. (714) 460-8938.

HP-11A (15M). Metal, retract gear, flap-aileron couple. Oxygen, basic instruments, open trailer. $6000. Tom Lappas, Box 42203, Las Vegas, Nevada 89104.

HP-14, the nicest flying. Hydraulic flaps, brake. Radio, instruments, oxygen, parachute, Imron finish, enclosed trailer. $10,000. (714) 796-9706.

HP-14, Bayside radio, instruments, oxygen, PIK style flap crank, steerable tailwheel, featherfill, enclosed metal trailer. Chute available. $8000. (516) 671-3949.

HP-18, carefully built. Basic instruments, chute, trailer. $12,000. (602) 943-8859.

HP-18 and trailer for sale. Dick Schreder, (419) 636-3184.

HP-18 fuselage, tail & trailer kits. Oxygen & instruments. Cost $6000, sell $4500. (713) 566-4012.

HP-18 FOR COST. 50 percent complete, includes completed Schreder trailer, excellent workmanship. $7000. (308) 236-5856 evenings.

VEGA IS HERE! Slingsby's brand-new racing class 15-meter all fiberglass sailplane with carbon spar, unique dual-function flap/brake handle, automatic water ballast hook-up, 42:1 performance, retractable gears (including tailwheel & towhook), and superior 13" extension of main gear is already a national and international winner. Write/call for specifics from Sprague Aviation, Inc., 2550 Pleasants Valley Rd., Vacaville, Calif. 95688. (707) 446-0152 TWX 510-746-8254.

SCHLEICHER PUTS IT TOGETHER. Unbeatable performance with easy handling and excellent craftsmanship. AS-W 19 top performer in the Standard Class, AS-W 20 unbeatable racer in the 15-Meter Class. Fifty years of building fine sailplanes is your guarantee of excellent value. Write or call for further information. Schleicher Sailplanes, Inc., P.O. Box 118, Port Matilda, Pa. 16870. (814) 237-7996.

Ka-6E, lovely condition, always hangared. Factory trailer w/cover and wing covers. All instruments, Cambridge dual damp audio, total energy PZL, Alpha/100 w/battery, oxygen, 420 hrs. T.T. Now at Santa Barbara Airport. $8500. (805) 682-5266.

Ka-8B, recovered June 1979. Ceconite. Beautiful paint. Basic instruments with Cambridge vario, large canopy. Custom open trailer. Better than new, an excellent club cross-country ship. $7000 or trade for two-place. (318) 725-7797 days, (318) 726-4020 nights.

SUPERB Ka-6CR, like new, basic instruments, open trailer. Call (817) 461-0660.

Ka-6CR, BEAUTIFUL! Instruments, 2 varios, SST covered trailer, A-14A oxygen, radio, new canopy. Fresh annual at sale. $8000. (213) 823-6657 eves.

Ka-6CR, new fabric, fully instrumented, oxygen, parachute, and trailer. New annual, ready to fly. Call Rick, (805) 256-3870 days.

FOR SALE, AS-W 19, low hours, no damage, without trailer. Call Steve Doak, (214) 465-7457.

AS-W 19, no instruments, Schreder trailer. Phone (915) 366-4735 after 6:00 p.m. CST.

AS-W 17, carbon. (305) 655-4450, (305) 848-1318.

AS-W 20, 3 hrs. T.T. Fully instrumented, Smiley bags, oxygen bottle. Schreder "Elf" trailer. Cleary, (405) 848-2604.

AS-W 20. Wally Scott, (915) 366-0506.

BE READY for summer soaring. The new Speed Astir IIB is here! A super sailplane at a super price. We have two in stock for immediate delivery at the old price. The next available positions are in January 1981 and will be at the new higher price. Call or write: Soaring Systems, Inc., 724 N. Mission Road, Wichita, Kansas 67206. (316) 684-2823 or 686-5499.

THE BUY OF THE YEAR. '79 Speed Astir. Low, low time. Basic instruments. Excellent condition. Call Rick (805) 256-3870.

THE NEW COMPETITION Standard Astir is on its way. We have one still available in this container at the old price. The next available positions are in December 1980 and will be at the new higher price. Call or write: Soaring Systems, Inc., 724 N. Mission Road, Wichita, Kansas 67206. (316) 684-2823 or 686-5499.

LS-3, N4EH, instruments, radio, oxygen bottle, and tandem wheel Komet trailer. $27,500. Contact Darryl Watson, (806) 794-2523 home, or (806) 741-3210 office.

LS-3. Instruments, radio, Komet trailer. For sale after June. $25,000. Hearn, (301) 833-1273.

LS-3. Instruments and trailer available. $21,000. Zimmerman, (803) 271-8248 evenings.

LS-3A, Komet trailer, never flown. (303) 471-2529.

JANTARS. Orders now being taken on the Standard 2 and the Open 2B. Quick delivery dates available. Hughes/Lovelace, 2702 McKinney, Dallas, Texas 75204. Tom Lovelace or Ray Hughes, (214) 748-9477. Evenings and weekends, (214) 233-3501.

NUGGET. Nice, complete. Must sell. Make serious offer. (303) 482-9838.

OPEN CIRRUS, late model. Exceptional condition, enclosed Gehrlein trailer, Schuemann, instruments, extras, less radio. New arrival forces sale. $14,000. (305) 855-0936.

MINI-NIMBUS C, carbon wings & tail, fully-instrumented, competition-ready. Call (305) 238-2761.

MINI-NIMBUS, two to choose from. Glass or carbon wing, instruments & trailers available. Sell or lease-purchase. These are the best 15-meter ships available at any price. Airleasco, 3430 West Ridge Rd., Joliet, Illinois 60435 or (815) 725-7011 late evenings.

MINI-NIMBUS, fully sealed, Bikle contoured wings, complete panel, Eberle trailer. Robert Nethercutt. (213) 459-3601.

SHK-1, enclosed metal trailer, 360-channel aircraft radio with Plantronics microphone, 100-channel ground radio, triple range Cambridge variometer w/audio—total energy, Winter combination airspeed variometer, spare Winter variometer, new constant-flow oxygen. Parachute, Globe 14-volt 7.5 amp-hr gel/cell with charger, wing root fairings, barograph, double camera mount with cameras, covers. Supership with everything you need! $10,500. Ray, (714) 983-1511 or (714) 981-4472.

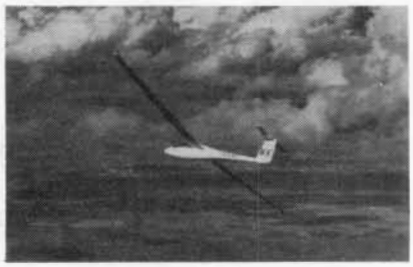
SHK-1. Part share in Connecticut or all. Displayed at 1980 Convention. (203) 565-5809 days, 635-2860 eves.

BUY A LARK—The Lark I.S.-29D2 is the best buy for a 38:1 single-seater, all-metal, flapped 15-Meter Class sailplane with beautiful handling. Contact Sprague Aviation for 1980 delivery position and demo flight. 2550 Pleasants Valley Road, Vacaville, California 95688. (707) 446-0152.

LARK I.S.-29D2. New late 1979. 63 hrs. T.T. All-metal single-seat, retractable, flaps, spoilers, 38:1. Exceptionally easy to fly. Complete instruments, Winter mech., Cambridge electric w/audio, 360 Edo-Aire, 44 cu.ft. demand oxygen, tools, spare parts. New custom trailer. Like new for $2000 less. Lee Kuhlke, (303) 988-9200 eves.

KESTREL 17. Excellent condition, fully instrumented, no radio, factory trailer. $16,800. Mandla, 3320 Beauclerk, Montreal, Quebec, Canada H1N 3J8. (514) 326-1243 days.

GLASFLÜGEL BS-1, serial #17, 18.3-meter span, 44:1 best L/D. Open Class sailplane with trailer, airspeed, altimeter, Cambridge electric variometer, Sollfahrtgeber. New canopy and license $14,500. Call (213) 651-0598 or (714) 674-1584.



MOSQUITO #80 WK (as pictured in the 1981 Richard Bach Calendar) 4th place 1978 Nationals. Full race-ready to go! Cambridge vario/audio, PZL, Winter Sollfahrtgeber, Edo-Aire 360, oxygen, and custom water ballast system. Komet trailer. $24,000. (602) 948-7626/948-4121.

MOSQUITO, 1977, serial #47. 200 hrs. T.T. Like new. Custom trailer, no instruments. Must sell. $21,500 or best offer. Not working, can deliver anywhere. Frank Lilly, (816) 373-6139.

H-301B Libelle, excellent condition, metal trailer, complete instruments, radio, water, oxygen, low time. Bob Bell, (916) 988-9656.

STANDARD LIBELLE 201B #390. 107 hrs. T.T. Metal trailer, basic instruments, excellent condition. $14,000. (516) 223-9456 eves.

STANDARD LIBELLE in top condition, fully sealed. Full competition panel including Schuemann T.E., Bayside radio, oxygen, cameras, Smiley bags. Original Kuhn trailer. $15,000. (313) 761-5481.

LIBELLE 201B, serial #334, 164 hrs. T.T. Well cared for. Full panel including oxygen, factory water, and aileron seals. Custom tilt trailer. Includes chute, Bayside 5W 2-channel crew radio w/x-country antenna, Winter barograph. $15,500. Contact Garry Kerr, (415) 825-2172.

LIBELLE 201B, Serial #177. Factory trailer, Ball and Sage varios, PZL compass, calibrated 35,000′ altimeter, clock, Endurox oxygen, barograph, compass, spares. Dinged but not broken. Immaculate, $15,000. Bill, (814) 355-1792 or (608) 233-4815.

MG-23. Closed metal trailer, Bayside, 38 cu.ft. oxygen, PZL/dual Cambridge/Piep Varios, Security chute, X-25 cameras, Winter barograph, Genave ground radio, Fiberglass/Imron finish. $8000. Eleven logged Diamonds. Ideal economical partnership bird for Sports Class competition, x-country, and badge flying. Camarillo, Calif. (805) 482-2415.

1-26B, #343, oxygen, basic instruments. $7000. Trailer available. (201) 877-6619 days, (201) 221-9010 eves. and weekends.

1-26B, NEW CONDITION. New electric panel, radio, crew radio, trailer. Complete package. Call after 6:00 p.m. (305) 238-2761.

1-26C, serial #248. Better than new. Stits recover, polyurethane paint, Bayside radio, barograph, Rico vario, 38 cu.ft. oxygen, custom trailer, many extras. Competition ready. Gary Knapp, Novato, Calif. (415) 897-6495.

1-26D, #480, 570 hrs. T.T. Excellent condition, basic instruments included for $7500. Electric vario and radio extra. (914) 949-6336 or 354-2750 eves.

1-26E, low time, excellent condition, trailer. (901) 725-4021.

1-26E, #562, excellent condition. With trailer. 113 hrs. T.T. (714) 983-1761 days.

DEALER LOST FIELD SALE: '77 1-26E, #669, zero hrs., $12,995; '75 1-35, #21, 130 hrs. T.T., $17,000; '77 B-4, #261, 270 hrs. T.T., $14,950. No damage, trailers available. (206) 454-2514.

1-26E, serial #622. Schuemann bottle & vario, speed ring, Piep audio, Radair 10S, extras. Always privately owned. 220 hrs. T.T. $9900. (513) 288-2609.

1-26E, 1974, 210 hrs. T.T., radio, oxygen, trailer. $9000. 1-26E, 1977, 240 hrs. T.T., basic equipment, new cover and paint. $9500. Mike, (303) 495-5812 or 495-4158.

1-26E, 1974, 500 hrs. T.T., Flush-riveted wing, fuselage, & vertical stabilizer. Winter & Cambridge dual varios with audio & T.E. $8900. (312) 896-9570.

SCHWEIZER 1-26E with full covers. T.T. 113 hrs., 10-channel transceiver with rechargeable nicad battery pack. Rainco Mark V compensating venturi. Sailplane trailer, 27' with full metal frame covering. $9850. (804) 355-4359 days, (804) 740-4202 nights.

1-26E, serial #580, T.T. 283 hrs. Flush riveted wings. Winter with Schuemann box, Cambridge with audio, 5-channel Mentor, 14-volt gel/cell, push-to-talk switch. Always hangared. Ranger enclosed metal trailer. Many extras. Call after 9:00 p.m. (212) 580-3616. Ask for George.

1-26E, #651. New Imron. Radio, dual varios, zippered ground cover. $10,000. (305) 886-1480 after 6:00 p.m.

1-26E, serial #652, 65 hrs. T.T. Enclosed trailer. Radio, total energy. Excellent condition. $12,000. (608) 274-7296.

1-26E with a leaseback business to Great Western Soaring School. $9000. Call (213) 376-7300.

SCHWEIZER 1-34. New white enamel with black racing stripes. New low profile canopy with vent scoop. Annual as of sale date. $12,750. (215) 683-3821, Kutztown Aviation.

SCHWEIZER 1-34R, oxygen, chute, retractable gear, Cambridge audio vario, Sollfahrtgeber Winter vario, open trailer. Price reduced to $12,500. (914) 939-8500 weekdays.

1-34. Basic instruments, Schweizer trailer. Hangared Salisbury, Maryland. Tom Burton, Box 236, New Church, Virginia 23415. (804) 824-4015 nights.

1-35C, serial #79, enclosed trailer, oxygen, Mentor radio, Cambridge vario with audio, Winter vario, turn & bank, airspeed, altimeter, compass. Privately owned, never damaged. $17,200. Call (203) 734-2979.

SCHWEIZER 1-35. Excellent condition. Custom enclosed all-metal trailer available. (213) 765-6611 days, (213) 883-5579 eves.

SCHWEIZER 1-35, all mods, competition ready, immaculate. Trailer available. $17,900. J. Seymour, (203) 775-9260.

SCHWEIZER 1-35C, excellent condition, low time. Basic instruments, A-14 oxygen, radio, & new Gehrlein convertible trailer. $14,000. Call (303) 340-2085.

TWO-PLACE FOR SALE

Ka-7, ideal for club or family. L/D 27:1, double set instruments. Radair 10, trailer, fresh annual. Steal at $8750. (503) 648-5556 after 6:30 P.S.T.

AS-K 13 w/open trailer. $9750. (615) 266-1767 or 338-2000.

BN-1 "Phantom" modified L-K. New wings and T-tail. Aluminum trailer. New annual. $4000. Offer or trade. (213) 450-2223.

LK-10A, flat-top. July annual. 1100 hrs. T.T. With trailer. $3000. (208) 664-2937.

LARK I.S.-28B2. Open trailer. $16,000. (503) 935-3437.

LARK IS-28B, 17 meter, 36:1. Test-fly one at Colville, Washington. Contact Jey Aero, P.O. Box 64, Colville, Washington. (509) 684-5162.

TEST FLY a new Romanian Lark I.S.-28B2 at Ridge Soaring, Inc., Julian, Pa., your eastern Lark dealer. For information on the complete line of Lark or Slingsby Vega sailplanes, write or call Ridge Soaring, Inc., RD Julian, Pa. 16844. (814) 355-1792.

HAVE A LARK WITH A LARK! The Lark I.S. 28-B2 two-seater represents the best buy available in the world of two-seaters. This 17-meter 36:1 all-metal flapped sailplane includes tail dolly, tools, spares, etc. Contact Sprague Aviation for 1980 delivery position and demo flight. 2550 Pleasants Valley Road, Vacaville, California 95688. (707) 446-0152.

LARK I.S.-28B2, serial #39. Dual instruments including 76 cu. ft. oxygen. New 360-channel Genave radio. Custom molded fiberglass canopy cover. Spare canopy. 160 hours total time. Never "off-field." $20,000. (415) 449-1105 after 4:00 p.m.

LARK I.S.-28B2 '77. Dual instruments and radio. No trailer. $18,500, or make offer. Call anytime and ask for Bill. (805) 822-5267.

LARK I.S.-28B2. Fully instrumented with Cambridge vario/slave, and dual oxygen. 75 hrs. T.T. Never banged up. Seek one or two partners or sell outright. Currently based Air Sailing, Nevada. Custom Kocher trailer also available. Beautiful ship. (702) 331-3050.

LARK I.S.-28B2, serial #101, excellent condition. Full panel front and rear. (303) 925-9080 days, 925-3960 eves.

LARK I.S.-28B2, serial #36, ATC'd. Radio, Cambridge electric, oxygen. $15,500. Call Don, (817) 261-1782.

USED TWIN ASTIR with water ballast. Like new condition, with or without instruments, radio, etc. Call or write: Soaring Systems, Inc., 724 N. Mission Road, Wichita, Kansas 67206. (316) 684-2823 or 686-5499.

LEFT & RIGHT WINGS for a 2-33A, excellent condition. Roger Buchanan, (201) 874-8228 evenings.

DEALER LOST FIELD SALE: '77 2-33A, #492, 390 hrs. T.T., $11,250; '78 2-33A, #528, 150 hrs. T.T., $12,500. No damage, trailers available. (206) 454-2514.

2-33A, 1976. Striking red, white & blue. Good condition. Asking $10,900. Rob Wilkinson, Box 541, Wilton, Connecticut 06897. (203) 762-9583 office, (203) 762-5489 home.

TWO 2-33A's. Late '76 & '77, excellent condition, hangared. $11,500 each. (615) 338-2000 or 266-1767.

2-33A, 1975, 1500 hrs. T.T., optional paint & ballast. Excellent, $9600. Also '76 model. (312) 896-9570.

SCHWEIZER 2-33A, rebuilt, new instruments. $7500. (305) 597-3228.

2-33A, 1977, 510 hrs. T.T. Standard equipment. $9000. Mike, (303) 495-4812, 495-4158.

2-33A, 195 hrs. T.T., new blue and white Imron. $11,000. Roger Buchanan, (201) 874-8228 evenings.

NICE 2-22CK, all Ceconite, new Lexan, recent rebuild. Custom trailer. In annual. (814) 692-8321.

BLANIK FACTORY SPARE PARTS are available exclusively from Blanik Parts Co., 8782 Hewitt Place, Garden Grove, California 92644. (714) 897-9852.

LEFT WING for a Blanik L-13, complete with flap and aileron. Ready to install. Asking $4500. Turf Soaring School, (602) 582-3621.

BLANIK, standard instruments, clean. $11,000. (817) 261-1782 evenings. Ask for Don.

1976 BLANIK, fresh annual, new custom three-color poly paint. $12,500 or consider competition ship trade. (609) 428-8079.

BLANIK FLOWN BY ART SCHOLL in Disney movie "Sky Trap." U.S.A.F. camouflage paint scheme. $15,950. Write to P.O. Box 35, Wildomar, Calif. 92395 or call (714) 674-5467.

'72 BLANIK, N12YA, 80 hrs. T.T., with trailer. Located at Indiantown, Florida. $15,000 outright or equal trade for Cessna 172. Miramichi Air Service Ltd., P.O. Box 90, Douglastown, N.B. EOC 1HO. Canada.

BLANIK, 1974. Ceconite, custom paint and interior, full panels. Will aerotow. $12,500. Mike Machat, (213) 593-7741 days or 433-6221 evenings and weekends.

BLANIK, 1975, excellent condition, dual instruments, radio, Ball T.E. vario w/audio. $14,500. (813) 949-3167.

POWERED SAILPLANES

1962 SCHEIBE SF-24 motorglider, 26hp Hirth 4-cylinder engine. 23:1 glide ratio, German airworthiness certificate. Annual to 5/30/80. Fuselage refinished January 1979, wings refinished January 1980. $7500 or will consider Cessna 150 or mint 140 in trade. (219) 294-2823.

JOIN THE GROWING NUMBER of PIK-20E owners who are acquiring the first true self-launching high-performance sailplane. Retractable engine, water ballast. Agent, Tom Smith, Deansboro Road, Clinton, New York 13323. (315) 853-5842.

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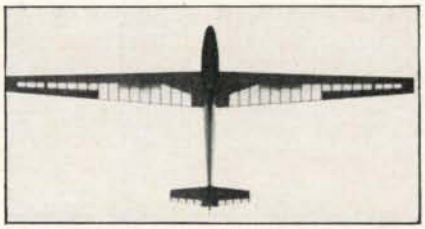

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