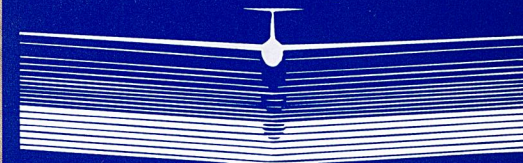


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National Soaring Museum

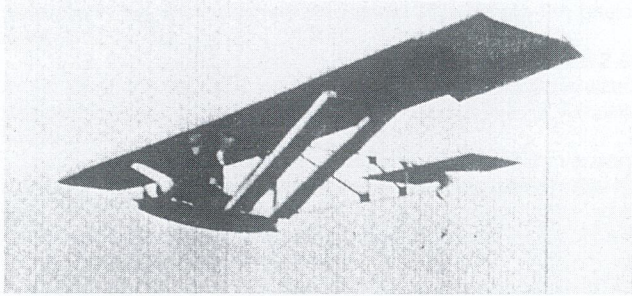


Ernie Schweizer: The World of Soaring's Quiet Mentor

Ernest Schweizer, co-founder of the Schweizer Aircraft Corporation, passed away in his sleep early on the morning of June 11, 2000 after a long illness. His legacy to the aviation community reaches back to 1930. That was when he, along with brothers Paul A. and William, mesmerized by Lindbergh's solo trans-Atlantic flight and reports of soaring activities on Cape Cod and in Germany, decided to shift their attention from aeromodeling with their Peekskill, NY, Mercury Model Airplane Club to the real thing. Ernie, then 18, and a high school senior, armed with some collateral reading on stress analysis and construction methods from *Popular Mechanics*, resolutely went to work designing their first glider, the SGP 1-1.

At the time, Paul was 17 and Bill 12. They had two sisters, Helen, the oldest of the children, and Emily, born after Paul. The sisters assisted with the sewing of fabric to the glider surfaces.

Restaurateur Papa Schweizer was less than enthusiastic about the project then underway in the barn's second floor hayloft at "Bonnie Brook," the family farm. However, when the elder Schweizer saw the quality of the boys' workmanship under Ernie's guidance, his apprehension lessened. Years later, Paul commented that the SGP 1-1's metal fittings were fashioned from sheet steel and aluminum, the latter coming from the door kick in their father's restaurant.



The Schweizer SGP1-1 (Schweizer Glider Primary single place first design)

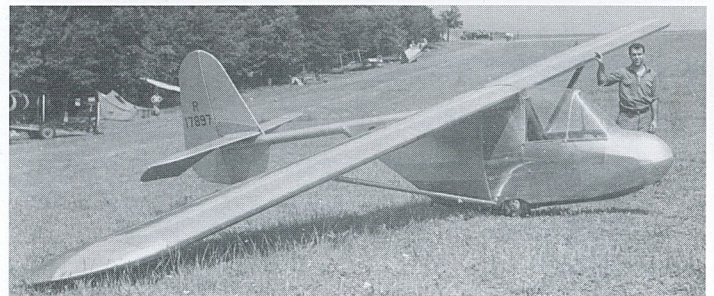
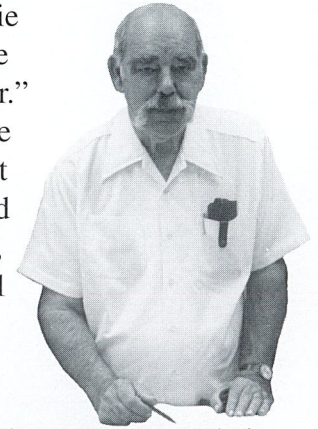
On June 19, 1930, with Ernie at the controls, the SGP 1-1 at the apex of a bungee cord tugged along by Mercury Modelers, thumped across neighbor Enoch Tompkins's field, and winged its way into soaring legend.

To celebrate the company's 50th anniversary in 1989, Ernie designed a full scale flying reproduction of the 1-1. When the ship was completed and assembled, Paul said to Ernie, "We have to do a

'weight and balance.' " Ernie looked at him and smiled, "We never did weigh the first glider." Not only did Paul and Bill take small hops in the SGP-1-1, but they were joined by the second generation, W. Stuart, Paul H., and Leslie Schweizer. The 1-1 is now on exhibit at the NSM.

That 1930 flight was only a few feet off the ground, but the Schweizer brothers had found their element. They all taught themselves to fly in the 1-1. Eventually it was wrecked, rebuilt with an enclosed cockpit and redesignated as the SGP 1-1A. That fall, flight operations halted as Paul and Bill went back to school, and Ernie entered the New York University's School of Aeronautical Engineering. Paul followed the next year.

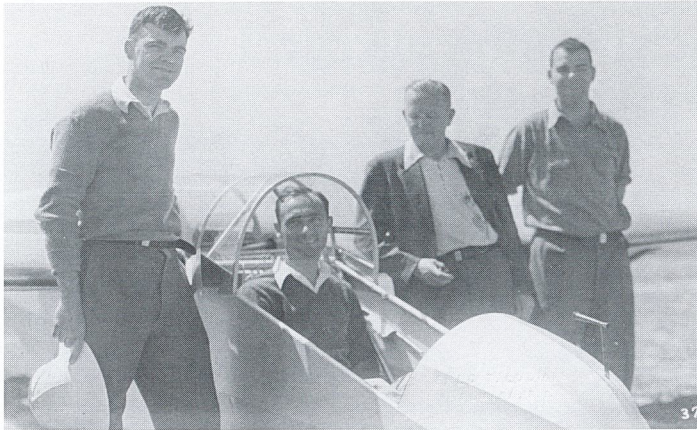
In 1931, the brothers attended the Second National Glider Meet in Elmira. On their way to the airport the first day they were passed by an ambulance. They later learned that it was for a glider pilot who had cracked up when the wings of his glider failed from over-stress. It was an incident that the brothers, especially Ernie, never forgot. In his book, *Soaring with the Schweizers*, Bill wrote, "This accident made us think about the importance of structural integrity and quality control in aircraft construction." When Ernie graduated from NYU, there were no engineering jobs available. He and Paul started Schweizers Metal Aircraft Company in the barn at "Bonnie Brook," while working part-time at their father's restaurant. A few years later, when it came time for Bill to enter college, Papa Schweizer nudged him toward a degree in business. The job market for aeronautical engineers was lean.



Ernie's all-metal design SGU (Utility) 1-6, Harris Hill, 1936
Loomis photo - NSM multi-media archive

Ernie's first design for their new company was the SGU (Utility) 1-6. It was the world's first all-metal glider. The 1-6 had a pod and boom layout that was intended to make it simpler and cheaper to build. "In spite of good flight characteristics the design was a little ahead of its time. The aviation public was not quite ready to accept an all-metal glider or sailplane," Bill said in his book.

In 1938, Ernie, along with Paul, designed and built a two-place, high-performance sailplane, the SGS 2-8. They felt that a market existed for a ship in which passengers could be flown and that would help expand the soaring movement. After extensive testing, the 2-8 was issued an Approved Type Certificate (ATC) by



The Schweizer SGS 2-8 Left to Right: Paul A. Schweizer, Emil Lehecka, Milt Girton (CAA), Ernie Schweizer Harris Hill, 1938

Loomis Photo - NSM multi-media archive

the Civil Aeronautics Authority (CAA), forerunner of the present Federal Aviation Administration (FAA). Previously, Schweizer gliders had been classified as "Experimental." This was the company's first sailplane to receive an ATC.

The company relocated from Peekskill to Elmira in 1939, at the behest of local attorney Robert P. McDowell and Elmira Industries. The name was changed to Schweizer Aircraft Corporation with Ernie elected President and Secretary, a position he held until his 1978 retirement. Paul was Vice President and Treasurer. (Bill was still attending Syracuse University, and joined the company after graduation in 1941.)

At the July 1940 National Soaring Contest, Ernie and Bob Stanley, chief test pilot for the Bell Aircraft Corporation, soared the 2-8 from Elmira to the outskirts of Washington, DC, establishing a new American two-place sailplane distance record of 219 miles. Later that summer, Lewin Barringer soared the 2-8, 14,960 feet over Sun Valley, Idaho, to a new

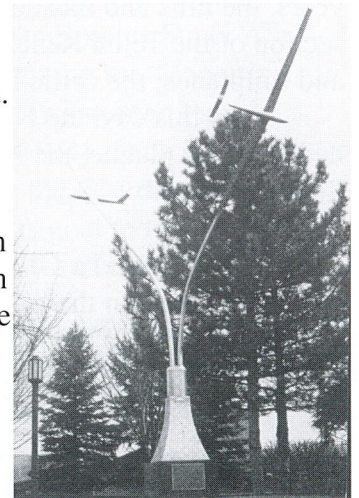
world's two-place sailplane altitude record.

With the ATC designation for the 2-8, its record-breaking flights and the immediacy of WW II, the fledgling Schweizer Aircraft Corporation started to move into the national aviation arena. Of all the plane builders' names of that era -- Northrop, Grumman, Curtiss, Boeing, Douglas, Lockheed, Martin -- only Schweizer Aircraft Corporation still flourishes under family ownership and management.

In *Soaring with the Schweizers*, Bill noted that during the summer of 1943, the daily meetings were switched from Ernie's office to his, and that Ernie always sat in the same chair. He also was aware that it lined up with Eileen Weed's desk. "I realized that there was some chemistry between Ernie and Eileen," Bill wrote. On December 11, 1943, they were married. Subsequently they had daughters Susan (Evans), Sally (Lese, who now heads the Schweizer Soaring School), Julie (Shephard), and son Leslie, who followed his father, designing aircraft and helicopters.

Ernie's engineering excellence and business integrity became key elements in the Schweizer tradition. He did the design and engineering work on every sailplane that the company built. Most of the 2,158 sailplanes built from Ernie's designs are still flying. They have retained the company's reputation for structural integrity, crash worthiness, and value. Many of the used Schweizer ships sell for more today than they did when new.

Early on, Ernie was recognized as a doer, and a person who led through example. His engineering acumen, emphasis on safety, and business fairness became cornerstones of the Schweizer tradition, and are characterized in the 5,700 sailplanes, agricultural and reconnaissance ships, and light helicopters that the company has produced. Partly through the use of wood in his early glider designs, Ernie became a master woodworker and an acknowledged authority on world varieties of wood. He was an expert in spinning pewter, and many of his outstanding pieces are in private collections. He was a skilled artist with either a sketch pad or camera. In his retirement, Ernie designed and



One of several sculptures designed by Ernie --this rotating sailplane piece honors the Anniversary of Rotary, and is located in downtown Elmira.

oversaw the assembly of three outdoor kinetic sculptures. One is located in downtown Elmira, another along I-86 near the Elmira-Corning Regional Airport, and another atop Harris Hill in front of the National Soaring Museum.

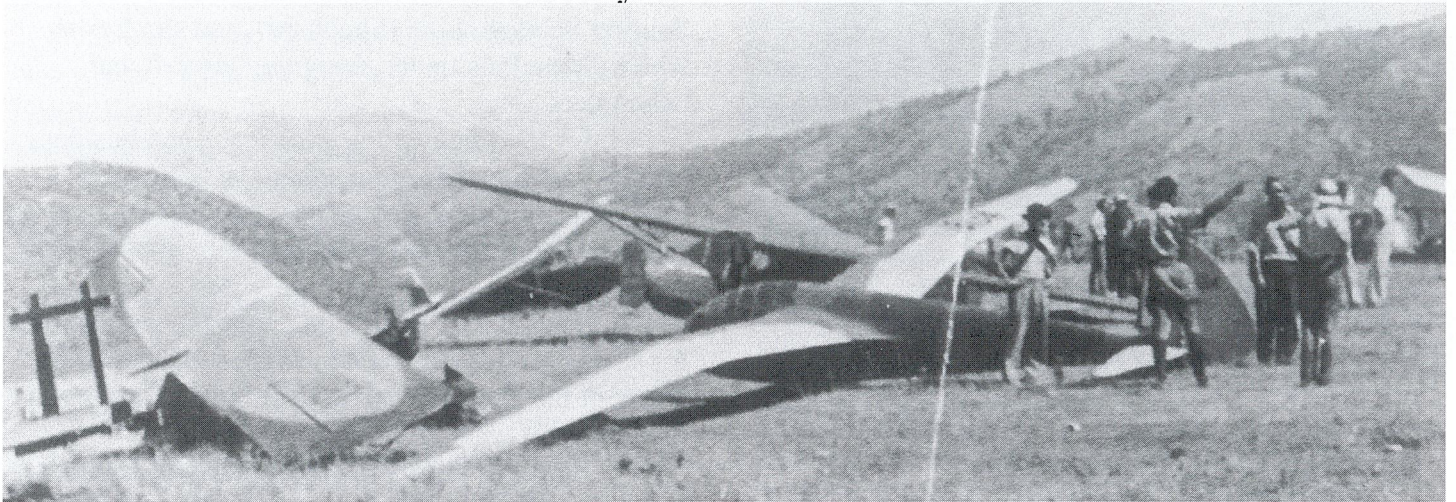
Ernie was an ardent supporter of the National Soaring Museum from its inception. He drew up plans, and directed the construction of the world's only known reproduction of Orville Wright's 1911 glider #5. It was for an NSM exhibit celebrating the 75th anniversary of Orville's 9-minute and 45-second soaring flight at Kitty Hawk, NC. And he did it from Orville's notes, photos, and memoirs, as no original drawings existed. Friends allowed that Ernie was

never a fashion plate, and that he smoked a corroded pipe and cheap cigars to excess. He said very little, but he listened very carefully. Those who knew him said that when he did have something to say, it was worth listening to.

On the occasion of the Schweizer Aircraft Corporation's recent 60th anniversary, Ernie was asked, "How do you feel about your life's work, and the contribution you have made to American aviation?" Thoughtfully, Ernie replied, "I'm satisfied we accomplished something; particularly when I get letters and comments from people who thank me for saving their lives. I'm happy I designed crash-resistant structures."

Arvin - Another Southern California Meet

by Simine Short



Some of the ships at a 1937 Arvin Meet

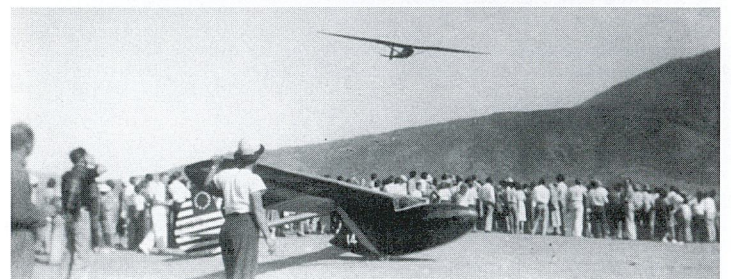
29 April 2000 --- Saturday, the Arvin-Sierra soaring site was to come alive again! After sixty years, the hills and meadows of the White Wolf section of the Tejon Ranch belonged again to people and sailplanes; the cattle had to mooooooove over.

On this day, the National Soaring Museum dedicated its plaque, the National Landmark of Soaring No. 10:

Arvin-Sierra Glider Port, 1937 - 1941.

Located on the hills in front of you, on the historic Tejon Ranch, the Arvin-Sierra Soaring Port was the site for the West Coast Soaring Championships. Many of America's famous glider pilots made record flights from here, soaring over the mountains and into the desert. The contests were popular events to pilots and public alike and the site

became the most important glider port in California, legendary in the history of soaring in America. When World War II shut down activity here, those star pilots became key to the war effort, as pilots, scientists, engineers, and builders of advanced aircraft, leaving an aerospace legacy that exists today.



Hawley Bowlus landing the Big Bowlus while Frank Kelsey in the Baby Albatross prototype awaits his winch launch, April 1931.

Frank Kelsey Photo

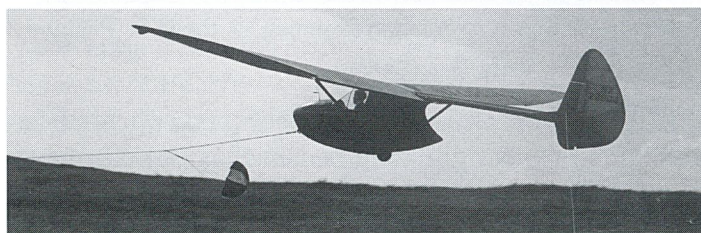
The Arvin-Sierra soaring site was discovered in 1930 by Charles Lindbergh and Hawley Bowlus. They had hoped to find a new site, away from photographers and the press in Southern California. Arvin is a small community in the southern section of the Sierra Nevada, just northeast of Lebec and west of the Tehachapi mountain range. The Tejon Ranch Company owned all this land then and they own it all now.



Linn Buell, NSM President, addresses the audience after the unveiling of the Arvin plaque, with Jeff Byard, NSM past President (left) and Simine Short, Chair of the NSM's Landmark Committee, April 2000

Here, one could experience ridge soaring conditions, but also thermals from the San Joaquin Valley. In the spring, the grass was green and covered with wild flowers, blue lupines and golden California poppies. This is how the hills looked in 1938 at the first Annual Western Glider Meet, and this is what modern glider folks saw this spring. Very little has changed at the Arvin-Sierra site over the last sixty years.

The Arvin site is special for Southern California and for the development of the sport of soaring in the United States. Here the prototype Bowlus Baby Albatross made its first soaring flights in 1938, flown by Hawley Bowlus, Stan Corcoran, and Stan Hall. This utility sailplane was to be sold as a kit for \$350 or in 10 units at \$35 per unit. Paul Deutsch still remembers his impressions of this ship: "The gleaming polished mahogany pod, translucent wings and

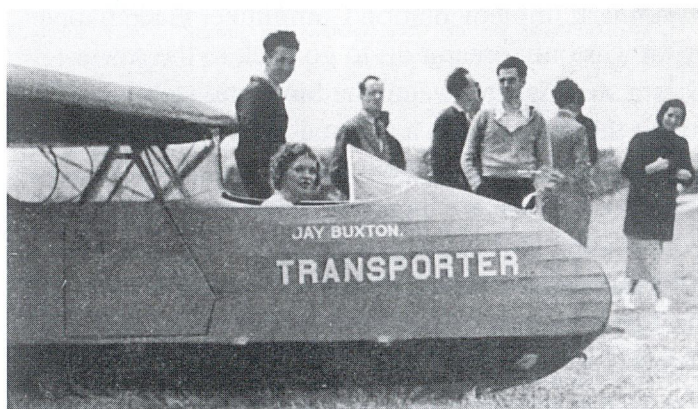


Richard H. Johnson's Baby Albatross NX 28804 launching at Arvin, 1941
NSM Archives

shining aluminum boom supporting the tail feathers looked to me like the design for the ultimate flying machine. I was thrilled to possess that glider."

The Arvin-Sierra soaring site was officially dedicated in 1939. Speeches and two souvenir mail flights, flown by glider to Bakersfield by Woody Brown and Hawley Bowlus, made it official. Lucretia Buxton, generally known as the "sweetheart of soaring," gave rides in the Buxton "Transporter" to just about anyone who wanted to come along. Looking at the faces of some of the oldtimers, just mentioning her name, brought smiles. Broken records in both attendance (an estimated crowd of 20,000 was reported in the Bakersfield Californian) and achievement of pilots marked this second annual meeting of the Southern California Soaring Association, held at Kern County's perfect sailplane field. Pilots, visitors, and the press all came and enjoyed the flying activities.

In 1940, distance and altitude marks were



Lucretia Buxton in Jay Buxton's "Transporter"

attained again by the nation's leading glider pilots. The first cross-country team flight of 172 miles was flown by Woody Brown in the Bowlus Super Albatross and Johnny Robinson, flying his "Zanonia", across the Mojave Desert to Twentynine Palms.

The following year in 1941, Dick Johnson as a slightly seasoned pilot made the best distance and duration flight; he declared as goal to land as close as possible to the Bowlus factory at San Fernando.



Arvin site with three gliders, April 2000

During the pre-flight inspection of his Baby Bowlus, he had discovered some broken strands on the aileron cables which needed to be replaced. He landed near Saugus, about 10 miles north of the factory. After flying almost six hours, he covered a distance of about 53 miles, though they were mostly difficult ones, he writes. Another outstanding flight was by Henry Stiglmeier, riding into a thundercloud over 7,000-foot high, snow-capped Bear Mountain. His altitude gain was probably a new American record, but the barograph stopped working at 19,150 ft., so we will never know how high he truly went.

The events at Pearl Harbor in December 1941 changed many lives. War took glider pilots to other activities and duties in different areas of the U.S. and the world. In the years that followed all they could do is dream and wonder, "Wouldn't it be great to go back to Arvin again?"

On April 29, 2000, a large team of volunteers working with Janice Armstrong, Chair of the local Landmark Implementation Committee, made happen what was only dreamt of, to go back to the Arvin-Sierra soaring site, watch the birds and sailplanes fly along the ridge, catch a thermal and relive the past.

Time stood still on this mountainous area. One can still see the huge oak tree under which the contestants' tents were erected and "where, at night, all the pilots and helpers went into a huddle and hashed over the flights of yesterday, today, and tomorrow," Buxton wrote in 1937. One can still see the area where the winch stood and where the launching cable to the gliders awaiting launch had dug a "trench" through the thin layer of grass. It seems that the site remained unaltered during the past sixty years.

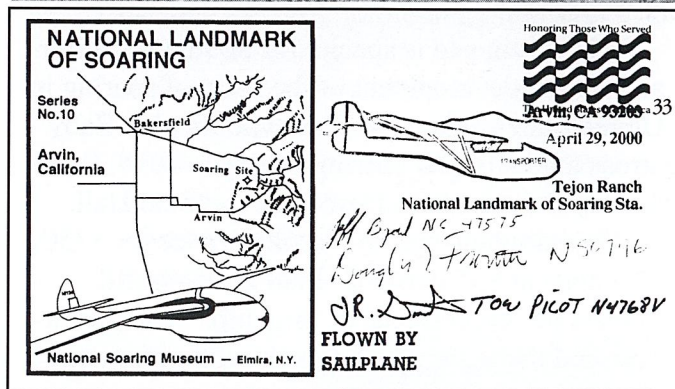
The Tejon Ranch Company agreed to open their corrals again. The day before the big event, volunteers marked the "runway" with white sheets and either removed rocks or marked the larger ones with orange markers. Jeff Byard flew over the site several times in his Cherokee airplane to gain experience, look for the unexpected, and share his knowledge with the other two pilots who would be landing at the site during the Landmark Ceremony.

Now everything was ready for the important day. Volunteer-driven vans, to minimize damage to the land, carried more than 300 people up to the site. The American flag firmly placed in the ground by a local Cub Scout troop flew high in the stiff breeze all morning long.

The ceremony began with welcome statements by Janice Armstrong, Lawrence Wernli of the Arvin Historical Society, and Tom Fane, manager of the White Wolf Ranch, a section of the Tejon Ranch Company.

Three sailplanes participated in the glider flight demonstration, the first highlight of the Remembrance Ceremony. Jeff Byard and Jim Short, Doug and father Bob Fronius, each flying restored TG-2 Schweizer sailplanes, and Wayne Spani in his restored Bowlus Baby Albatross actually relived the past and showed the spectators what the sport of soaring (and landing) was all about sixty years ago.

When cleared to land by Dan Armstrong, Jeff made his approach right over "The Tree" and landed uphill in front of the spectators. The Fronius father and son team came in just minutes later. Both parties handed over their pouches of glider-flown mail to the USPS representative. JR, the tow pilot who brought both gliders via double aero-tow from the Mountain Valley Airfield in Tehachapi, did some aerobatics,



Bob Fronius hands over his mail pouch to the U.S. Postal Service representative.

high in the blue sky. Soon Wayne Spani appeared. His landing was significant because his Baby Bowlus was contemporary with the early meets. It was emotional for the three pilots to come in and land their ships on a field which has not seen gliders for the past sixty years.

The ceremony continued. Two racing pigeons were released in memory of the two pilots who died in a midair crash in 1940. Stan Hall made his remarks entitled "I was Here." Phil Krauter reminisced about his participation as a line boy for Lucretia Buxton sixty years ago. Woody Brown, coming from Hawaii, talked briefly about the West Coast Glider Championships in general and Hawley Bowlus. Jack Bowlus, representing the Bowlus family, talked about his father and his contributions. It was very apparent that Hawley Bowlus was on everyone's mind because he was probably one of the key players behind the growth of the sport of soaring in California in the 1930s.

The final highlight was the National Landmark of Soaring Dedication, with Linn Buell, President, representing NSM. With Jeff Byard's help, the plaque was unveiled and presented to the community.

The Arvin Remembrance Ceremony closed with "America the Beautiful," loud and clear and beautiful, "from sea to shining sea." It was an emotional way of ending a memorable event.

With the assistance of the Sailplane Homebuilders Association, the Vintage Sailplane Association, and the National Soaring Museum, the Arvin 2000 committee did a wonderful job honoring the community, the historic Arvin-Sierra Soaring site, and all the people who were active then and now.



Hawley Bowlus in Big Albatross (1940?).
Photo Courtesy Frank Kelsey.

This tenth National Landmark of Soaring Dedication honored not only the Arvin community and the accomplishments of Southern California glider pilots, it also marked twenty years of efforts by everyone involved in this National Soaring Museum outreach program. It was a trip down memory lane, a site, a place, a time for recollection for the people who came to the Arvin site. It was a



Stan Corcoran in his "Cinema"

once-in-a-lifetime experience for those who had flown here, who had helped with the meets, then and now, and for newcomers to the sport who heretofore could only imagine being at this historically significant site.

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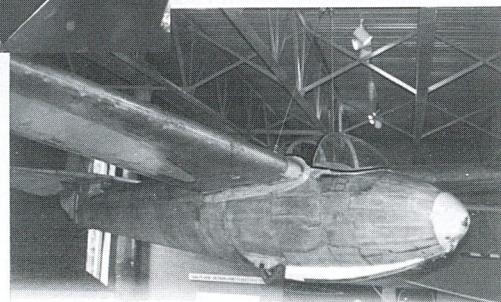
On the Cover

The Goppingen III Minimoa on Harris Hill before joining the National Soaring Museum collection. In August 1971, the "Mini" was given to NSM by the Rev. Carl Groom and restored by Richard Dassance. It was imported from Germany by Richard duPont in 1936. In 1938 Lewin Barringer flew the Minimoa to a 212 mile distance record from Wichita Falls, TX to Tulsa, OK from a winch launch.

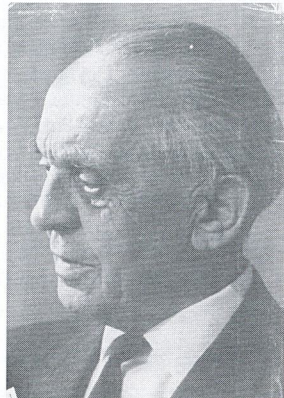


Left: Rev. Carl Groom, left, presenting the Minimoa to the National Soaring Museum, Mrs. Groom, center, and Ned Kelley, Harris Hill Soaring Corporation, at right.

Right: The Minimoa now on exhibit at the NSM.



Bruce H. Carmichael, Capistrano Beach, CA, delivered the 28th annual Ralph S. Barnaby Lecture October 14, 2000, at the Orange Tree Golf Resort, Scottsdale, Arizona. He opened by suggesting that for many of us, there is a crucial point in time that changes the course of our lives. For him it was 1949 when he attended the southwest soaring contest in Grand Prairie, TX. There, a contestant and former classmate, George Lambros, introduced him to Drs. Alexander Lippisch and August Raspet, two pioneering aerodynamicists. Lecturing in Fort Worth, Lippisch told the colorful story of the development of soaring on the German Wasserkuppe. Gus Raspet followed with descriptions of his Flight Research Station at Mississippi State College. "Gus believed in the sailplane as a tool for aerodynamic and meteorological research. He was looking for engineers interested in soaring to do some thinking and writing, and he enlisted me. He sent me back issues of *Soaring* and the remarkable Zacher flight test reports of the Darmstadt D-30 Cirrus and the D-29 Windspiel." Carmichael was hooked.



Dr. Alexander Lippisch

Bruce Carmichael was raised in Michigan's Upper Peninsula, and was fascinated by things technological from an early age. He graduated from the University of Michigan in 1944 with a degree in aeronautical engineering. Following Naval service during WWII, he spent over 40 years in industry as an applied aerospace and hydrodynamic engineer, specializing in drag reduction.



Dr. August Raspet, Mississippi Flight Research Director

In addition to assisting Dr. Raspet, he was associated with other such outstanding leaders in the field as Drs. Werner Pfenninger and Max Kramer. Carmichael has been the SSA's Aerodynamics Chairman and three-term President of the Sailplane Homebuilders Association. A prolific



Bruce H. Carmichael

The 28th Ralph Stanton Barnaby Lecture A HALF CENTURY OF SAILPLANE TECHNOLOGY

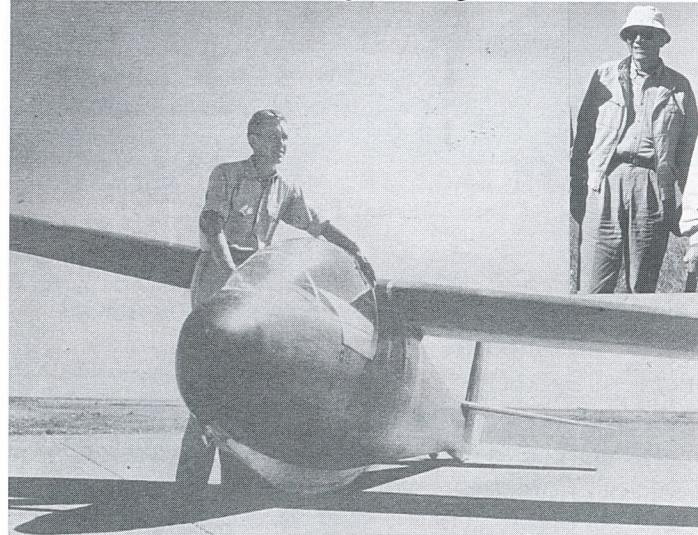
by Bruce H. Carmichael

writer, he has published technical papers here and abroad. He authored two books, *Personal Aircraft Drag Reduction*, and another on ultralight and self-launching sailplanes.

This annual Barnaby lecture series is named after its sponsor, the late Captain Ralph Stanton Barnaby, USN, naval aviator, author, sculptor, and musician. He held Glider Pilot's Certificate number one, which was signed by his friend Orville Wright. The National Soaring Museum initiated the Barnaby Lectures in 1973. They are related to historic and noteworthy achievements in motorless flight. These lectures are delivered by outstanding personalities in motorless flight. Carmichael mentioned that he met Barnaby in 1951, when Carmichael was in Elmira to give his first public talk. "Capt. Barnaby was very gracious and invited me to his table, where I heard details of his history first-hand," he said.

Dick Johnson, the RJ-5 And The World's Distance Record

On a visit to State College, MS, Carmichael saw Dick Johnson working on wings of the RJ-5. "Do



Dick Johnson and the RJ-5

you remember the excitement when the word came that Dick had broken the Russian-held distance record?" he said. Gus had sent the barograph to Bruce who did an analysis in a manner not seen before. It was subsequently published in *Soaring* magazine and in the German language *Swiss Aero Review*. Harland Ross, designer of the RJ-5, then designed, built, and flew to a

record in his RJ-6. Ross used the same Carmichael technique with his barograph. At Raspet's request, he wrote a futuristic article on what performance might be possible for sailplanes. "I projected, based on first principles, cases for fully turbulent, partially laminar (natural laminar flow) and fully laminar with artificial, boundary layer control," the lecturer said.



Len Niemi
Designer



Three Niemi Sisus

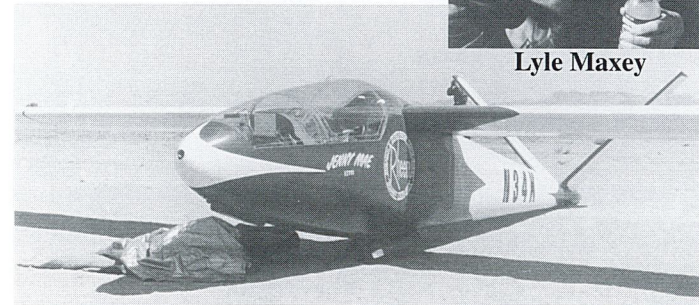
(Laminar flow -- the smooth flow of air over the contour of the wings.) Carmichael's English friend, Alan Yates, delivered Carmichael's paper to the second OSTIV congress (*Organisation Scientifique Et Technique Internationale Du Vol A Voile*) in Madrid, Spain.

In 1950, Gus smoothed the D-tube of a TG-3 and with the suction through the fabric aft of the spar, maintained laminar flow to the trailing edge. "Gus was the most optimistic individual in the world. He encouraged the least promising of us who showed any interest in efficient flight, to extend our efforts. "In 1952, Raspet asked Bruce to join him, extending his work on suction boundary layer control drag reduction. "In early morning glides from 14,000 feet we made detailed boundary layer measurements and carried the work as far as we could with a sailplane," he said.

"Raspet then obtained a flight test engineer's position for me with Northrop Aircraft's Dr. Werner Pfenninger. They had the contract to continue the



Lyle Maxey



Jenny Mae

work with a jet aircraft test bed to 10 times the Reynolds Number that we could obtain with a sailplane." (Reynolds Number -- Carmichael said that a physicist would call it the ratio of Inertial to Viscous forces. The Engineer would say it accounts for the density and viscosity of the atmosphere and the size speed product of the sailplane.)

On his way to California, Carmichael stopped in Texas to see a colleague from his Goodyear Aircraft days, Del Lewis. Lewis took him over to the shop "of that master engineer, Len Niemi." There he saw the prototype of the Sisu. He said that America in the 1950s led the world in high performance sailplane design through the work of Raspet and Johnson on the one-off RJ-5 and Niemi with the production of Sisus. "This was done the hard way; smoothing metal wings," he said.

Dr. Werner Pfenninger, Prophet of the Future

At Northrup in 1954, the speaker met Lyle Maxey who commented that Bruce's conclusions on wing loading based on the Lange thermal models taken at low altitudes in New England were too low for western conditions. "He went on to prove his point by winning the 1956 National Soaring Contest in the highly loaded Jenny Mae," Carmichael



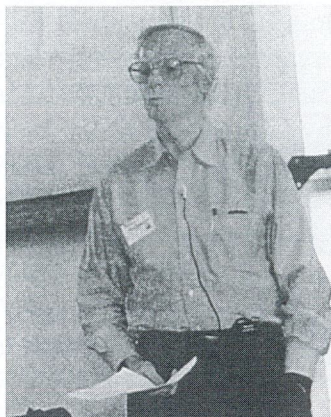
Dr. Werner Pfenninger right, with Bruce Carmichael

said. Before he left Mississippi State, Gus Raspet gave him a copy of NACA TM 1181, the English translation of Werner Pfenninger's remarkable design and wind tunnel experiments from model aircraft to sailplanes at Zurich, Switzerland. Pfenninger designed the Elfe high performance sailplane series. "Every refinement we have seen in the last half century was first demonstrated by Pfenninger in the 1950s," Carmichael said.

The 1959 SSA Technical Conference

In 1959, the speaker organized an SSA Technical Symposium in Los Angeles. Dr. Raspet gave a paper in which he suggested revolutionary, in addition to evolutionary, approaches to soaring. He proposed the extraction of solar energy for a portion of power required for level flight providing increasing lift over drag (L/D). He added, "Gus was such an instigator for

soaring progress. One can only wonder where soaring technology would be today had Gus not been lost in 1960.” Dr. Paul MacCready spoke at that conference on meteorological concepts for improving soaring. “Paul, who often speaks of Raspet as having initially inspired him, was already, in 1959, demonstrating high inventive character.”



**Dr. Paul MacCready,
Pioneering Regenerative,
Battery Augmented Soaring**



F. X. Wortmann

The Phoenix And The Composite Revolution



Richard Eppler

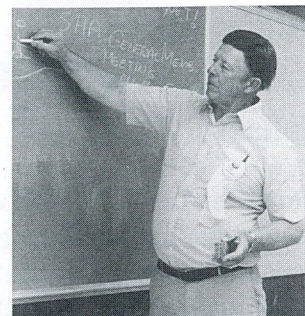
Carmichael asked his audience if they remembered that after WWII everyone thought plastics would bring us sleek, inexpensive sailplanes. In 1958 the Phoenix of Eppler and Nagele appeared as the watershed between how sailplanes had been made, and how they would be made in the future.

At the end of the 1950s, NASA shifted from aero to astro research, and we lost Dr. Raspet in a flight test accident. “Leadership once more reverted to the technical universities of Europe. Production composite sailplanes appeared, starting with the Phoebus and Libelle. From this beginning came the present 15-meter sailplanes with L/D of 60,” he said. They were sleek and high performance, but extensive hand finishing made them expensive.

American and Canadian Progress

The Schweizers continued to produce metal sailplanes of ever-increasing performance, as well as trainers, “and the beloved 1-26 in which so many of us encountered the pleasures of soaring,” he smiled. He added that Jack Laister’s Nugget, Schreder’s plans for all-metal, high-performance sailplanes,

Zimmerman and Shaer’s Concept 70, and George Applebay’s Zuni composite sailplanes, were all available. Canada’s David Marsden designed, built, and flew the two-place, all-metal Gemini. Marsden also took over the



Dick Schreder



Schreder HP-16

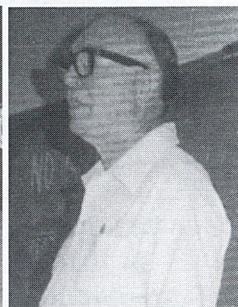
British Sigma super sailplane project. He converted its too-complicated variable area feature to a clean, large-slotted flap.



Paul A. Schweizer



David Marsden



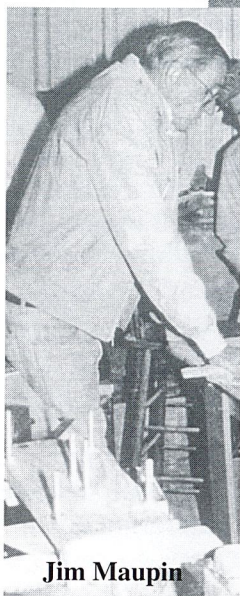
Jack Laister

Airfoil Design

Carmichael explained that the NACA (National Advisory Committee on Aeronautics) airfoil (wing cross-section) design method applied by Eastman Jacobs was superseded when German-developed laminar sailplane airfoil adjusted the geometry to produce the desired pressure distribution; then boundary layer calculations revealed whether further adjustments were required. Theoretical lift, drag, and pitching moments result.



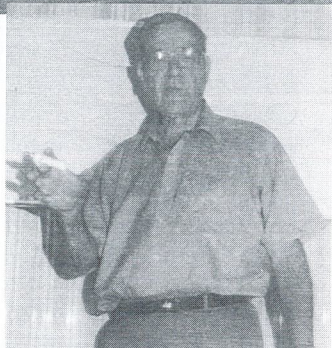
SSA Design Contest Definition, April 1981. Judges Meet at Douglas Aircraft Museum: Lamont, Carmichael, Laister, Hall, Mooney, Culver, Nicks, Enevoldson



Jim Maupin



**Culver-
Maupin
Windrose**

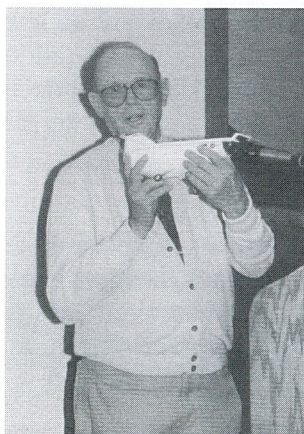


Irv Culver

Early in 1960, Dr. Richard Eppler designed a special airfoil for the Phoenix. He and F. X. Wortman developed different airfoils for different design applications. Eppler worked with NASA Langley's aerodynamicist and sailplane pilot, Dan Sommers. "Together they made their method available to all," Carmichael said. "Sailplane airfoil design has continued at NASA Langley, Ames, Massachusetts Institute of Technology, Penn State, Braunschweig and Delft. John Rontz was an early user, and designed the wing and canard (stabilizer placed in front of the wing) for the Rutan Solitaire. Airfoils have been designed with laminar flow to 70% of the cord on both upper and lower (wing) surface."

Air Foil Data

In a highly technical segment of his talk, Bruce Carmichael discussed the evolution in sailplane performance investigation, with reference to low turbulence wind tunnel data on low-drag airfoils at sailplane Reynolds Numbers. He mentioned works of Quinn,



Gus Briegleb, Designer



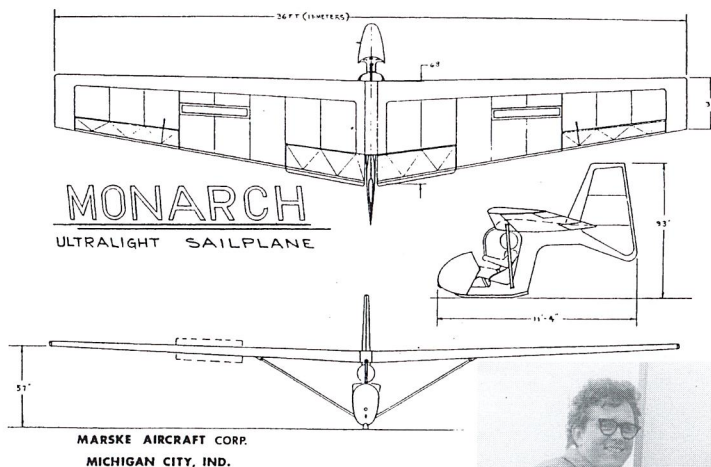
**George Applebay & Irv Prue,
Designers**

Maxey, Pfenninger, Dick Lyon, Hugh Dryden, Wortman, and Althaus. These, together with Eppler-designed airfoils, were applied to production-composite, high-performance sailplanes.

Another esoteric subject that the speaker touched on was Low Drag Boundary Layer Suction Control. He spoke of his work with Raspet and Pfenninger on wing profile drag reduction by using suction to obtain theoretical 100% laminar flow. He quoted extensively from *Technical Soaring* articles by Pfenninger and Plesser, that described their experiments.

Sailplane Flight Tests

Influenced by the precise work of Zacher, Raspet initiated sailplane flight testing at Mississippi State. Working with Dick Johnson, this led to refinement of the RJ-5, resulting in the highest sailplane performance of that time. Paul Bikle also took up flight testing on the West Coast. Dick's articles detail requirements on weather conditions and accurate speed calibrations. He and Masak have shown the performance improvements possible with waviness reduction, leading edge contour refinement, and sealing against leaks. "Dick's remarkable contributions again recall the ever reoccurring Raspet influence," Carmichael said.



Technical Soaring Publications

Bruce Carmichael also mentioned that many technical articles have appeared in *Soaring* magazine. O.S.T.I.V. papers from international soaring contests have been partially republished in *Technical Soaring*. They are an excellent source of the latest thinking and provide the latest papers from numerous technical symposia and national soaring gatherings. Then he listed several helpful books.



**Jim Marske,
Monarch & Genesis**

Dr. Paul "Doing More With Less" MacCready

"Paul has dreamed of advances, reduced them to numbers and then demonstrated practical proof of those dreams," Carmichael said. "He solved special problems, and produced the first manpowered flight about pylons and flight across the English Channel. One can only speculate at what new flight accomplishments he and outstanding people he attracts will bring to our attention."



Stan Hall,
Cherokee

Al Backstrom,
Flying Plank

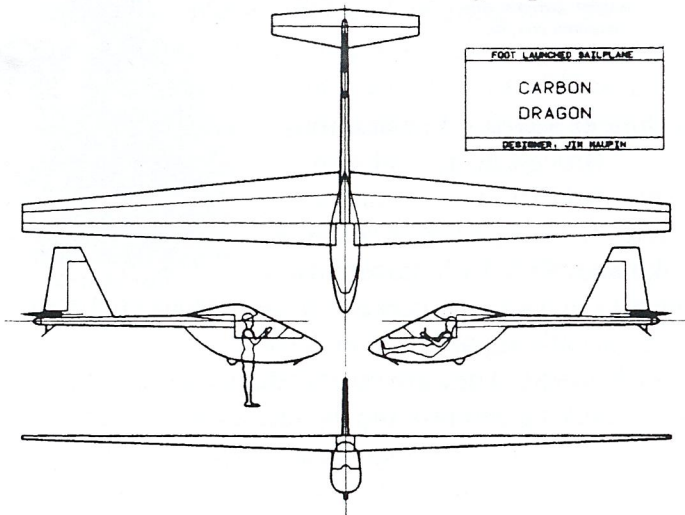
Gary Osoba,
Microlift Soaring
Research

The Hang Glider Era

The Barnaby speaker said that in the late 1960s, efforts were made to promote inexpensive, more primitive soaring. The movement was backed with pamphlets by Emil Kissel, Richard Miller, and Joe Faust. The first Otto Lilienthal meet was held at Corona Del Mar, CA, in 1971, and hang gliding was off and running. Tarus Kicenuik demonstrated foot-launched soaring of a rigid biplane. Irv Culver designed and Valmer Jensen built a 100-pound, rigid wing, three-axis control hang glider that could soar in the lightest conditions. "Hang gliding developed separate from the SSA, much to their relief," he said.

The Sailplane Homebuilders Association

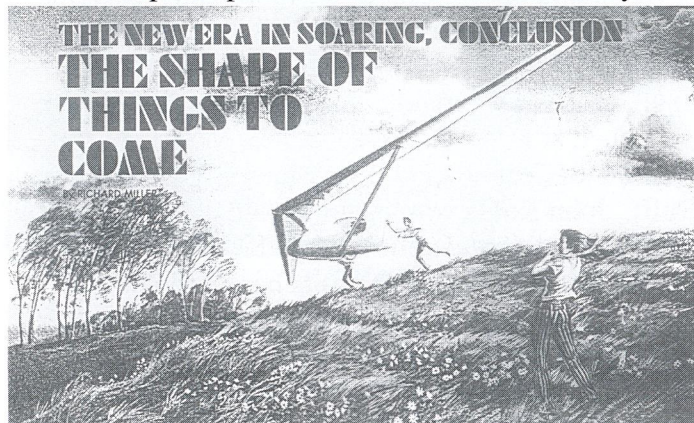
Sailplane costs continued to increase. A small group within the SSA was interested in less expensive sport soaring. "With the exception of Paul A. Schweizer, the SSA powers seemed not to be interested," Carmichael said. In 1979, a group was formed



to promote, "the road not taken." A number of paper-only design contests were held to smoke out new ideas. Meanwhile, individual builders Don Mitchell, Jim Marske, Irv Culver, and Jim Maupin, produced sport sailplanes to continue the pre-SHA work of Stan Hall, Hank Thor, Ben Jansson, Prue, Briegleb, and Larry Haig. The east, central, and west workshops produced technical lectures, many of which were published in the Association's publications, *SHAp Talk* and *Sailplane Builder*. All, including Carmichael, sought the Holy Grail of soaring: a sailplane sinking speed of one foot per second. "It would be possible through the daylight hours most places, most times of the year," he said. Franklin Farrar of Vanderbilt University built such a ship in 1966, but did not obtain extensive flight experience before it was damaged on the ground. The speaker said that these bold experimenters, along with Gary Osoba, Dan Howell and Tarus Kicenuik, are coming close to developing dynamic soaring with sailplanes of very low sinking speed. "A new era in soaring could well be in the offing," he said.

Quo Vadis -- Where Do We Go From Here?

Sailplane performance has been markedly



improved through airfoil design, the cruise flap, boundary layer trippers, and slotted flaps, together with high wing loading. He said that the mechanical complexity of variable area (chordwise or spanwise) calls for some new approaches to these developments. Tailless configurations, detection and exploitation of the variable air mass, and many other areas of flight investigation were posed by the speaker. "Perhaps in several generations, the coupling of the soaring pilot to distributed wing sensors as suggested by Richard Miller will occur. To quote that mysterious sage, 'Is there no limit to the fiendish ingenuity of man?'"

Conclusion

The speaker concluded: "Looking back over a half century, I see them now as when first we met. The dreamers and the doers, the theoreticians and the experimenters, the designers, builders and flyers, all of whom added so much interest to all of our lives. BLESS THEM ALL!"

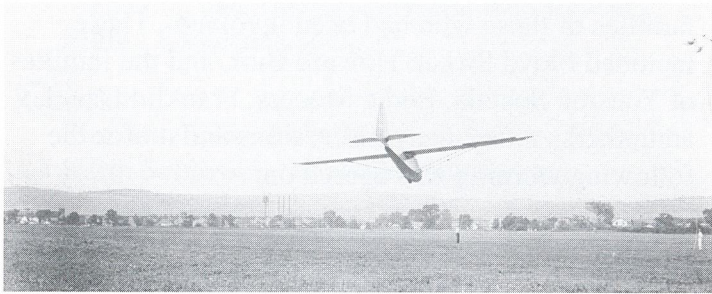
The Original Elmira Takeoff Sites Landmark No. 11

by Paul A. Schweizer

So much time has passed by that I feel it is generally believed by most soaring enthusiasts that Harris Hill is where soaring was first done and where the first National Soaring Contest was held.

Actually, the first flight from Harris Hill did not occur until 1934, while the first National Soaring Contest was held, and the first flight made in this area in 1930. Gliding headquarters was at the Caton Avenue Airport on Elmira's southside and takeoff sites were located on the tops of a number of local ridges that faced different wind directions.

Dr. Wolfgang Klemperer had chosen this area as a potential site for the first national soaring contest. Jack K. O'Meara was sent here by the National Glider Association (NGA) to try out the soaring conditions. O'Meara and Sherman Voorhees, the airport manager,



Elmira's Caton Avenue Airport - 1931

Loomis Photo - NSM Archives

decided that the logical place from which to make the first soaring flight was from South Mountain that overlooked the City of Elmira and which was within easy gliding distance of the Caton Avenue Airport.

On July 1, 1930, Voorhees and a group of local volunteers bungee launched O'Meara from South Mountain. Fortunately, there was a good brisk northwest wind blowing against the ridge. He was able to stay up for 1 hour and 34 minutes, an excellent flight for that time. This was O'Meara's first soaring flight and the first soaring flight in the Elmira area. Over the next few days, he made a number of additional soaring flights which confirmed Dr. Klemperer's forecast of soaring in this area. As a result, the NGA enthusiastically decided to hold the first National Soaring Contest in the Elmira area in the fall of 1930. One might wonder what Elmira's future would have been in soaring if there had not been ridge winds blowing that weekend.

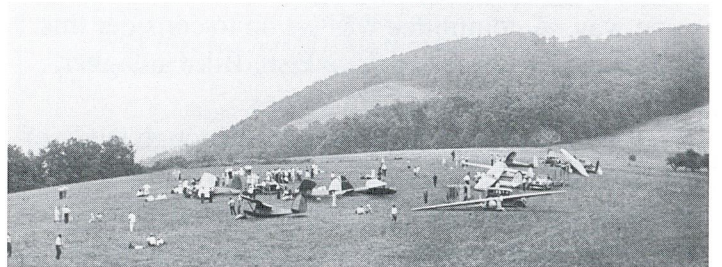


Harris Hill 1936

Voorhees had sold the Elmira Association of Commerce on backing the contest, and they immediately set up committees to handle various phases of the Contest. This was during the early days of the Depression, and the community was eagerly looking for something to stimulate business and tourism to the area.

In addition to the South Mountain site, they looked for takeoff sites for winds from other directions. They chose sites on East Ridge, which ran north and south and overlooked Elmira, Elmira Heights, and Horseheads, and would be ideal for west winds. The most promising site was found not far from the Mark Twain Quarry Farm on East Ridge. Another site for northwest winds, that seemed better than South Mountain, was located on the Rhodes Farm in Big Flats. A fourth site was located on the Close Farm on the mountain north of the present Elmira-Corning Airport which would be for south winds. Other sites were tested but these four became the main takeoff sites during the 1930-1933 period.

The first National was a very successful contest and with good winds blowing, there were a good number of ridge soaring flights made, mostly from the South Mountain site. The headquarters was at the



An early meet on one of Elmira's contest sites

Caton Avenue Airport where many of the pilots and crew camped. A pilots' meeting was held there each morning, at which time they determined which ridge had the best soaring conditions for that day. The pilots and crew then trailered their gliders to that takeoff site and assembled them. Each pilot had to qualify with a "glide to the valley," which included a bungee launch and a glide to the airport below. He then was ready to attempt a soaring flight.

Over the next few years, these takeoff sites were improved, and in 1933 the headquarters was moved from the Caton Avenue Airport to Hill No. 6, the Rhodes Farm in Big Flats.



Floyd Sweet, keynote speaker at the 11th Landmark of Soaring Dedication.

There were not many days during the 1933 National when the wind was on the ridge so they could make a soaring flight. Thermal soaring conditions were present most of the time, but pilots had no way to reach them. They began to realize that they needed a site from which gliders could be launched to greater heights by auto or winch tow and even aerotow. A local committee, headed by Franklin Iszard, was set up to locate such a site. They found a site just east of the Rhodes Farm where three hay fields were turned into a takeoff field; that became Harris Hill. In 1934, the fifth National meet was conducted from there. Nationals were held there every year (except the 4 years of WW II) until 1947. After that, Harris Hill took its turn with other national soaring sites around the USA to conduct the National Contests.

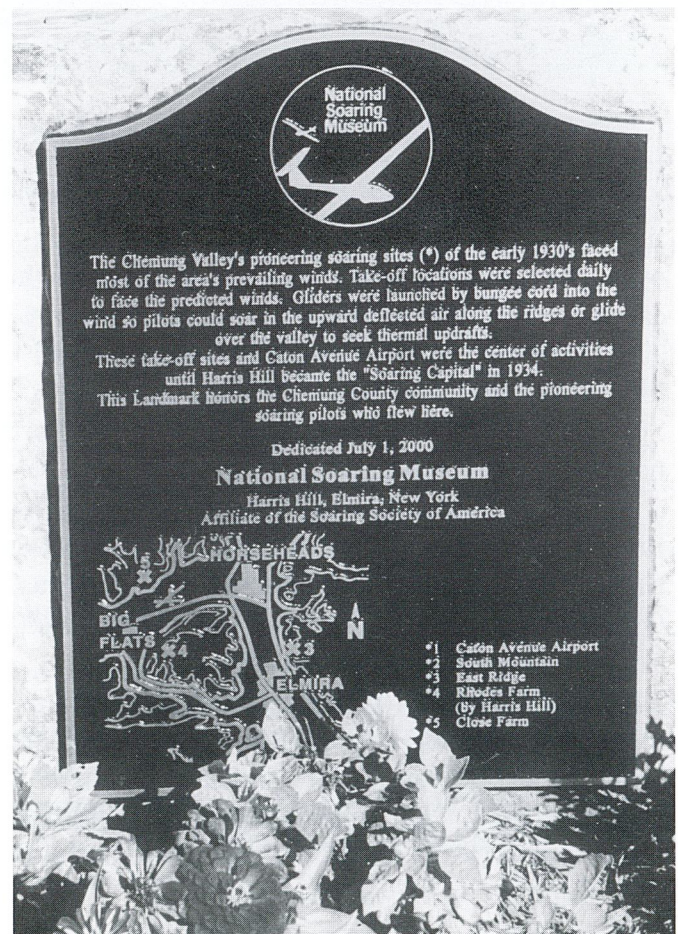
A few years ago, a number of Elmira soaring people felt that these early takeoff sites were being forgotten and that they should be remembered in some way. A committee was set up to consider this. The committee included Jaye Fish, Bill Gallagher, Paul A. Schweizer, and Tim Welles.

Bill Schweizer had made a thorough study of the East Ridge site, working with Carl Morrell who had been interested in this site for a number of years. When the location and the ownership of the East Ridge site was determined to be the Proko family farm, the committee looked into the status of the other sites. A search was made to locate the takeoff site on South Mountain, but it was difficult to find the exact location due to the growth of trees and bushes over the 65 years since it was last used. Site No. 6, the Rhodes Farm, is still in the family but the Close Farm site is now completely overgrown with trees.

All these sites, with the exception of the

Rhodes Farm, are located on secondary roads. Therefore, markers at those sites would not be seen by soaring enthusiasts visiting the area. So it was decided to locate a plaque on Harris Hill that told the story of all these pioneering sites. The plaque would be mounted adjacent to the Warren Eaton Flight Center where most visitors interested in soaring would see the plaque. It is also an appropriate location since a plaque, commemorating the location of the military's first glider training school, is also located there.

Such a plaque commemorating these pioneering sites would logically fit into the NSM's National Landmark Program. After submitting the necessary data, we were advised by Simine Short, Chairperson of the NSM Landmark of Soaring Committee, that our request had been approved, and work on the project started. The first step was to raise funds to cover the cost of the plaque and related expenses. Contributions were received from pilots who had flown from these takeoff sites and from families of those who had been involved. These included Floyd Sweet, Howard Burr, and the families of Youston Sekella, Eddie Mooers, Franklin Iszard, and others. After many discussions and drafts, the following wording was agreed on:



The NSM Landmark Committee approved the plaque and plans were made to dedicate it at the Opening Ceremony of the International Vintage Glider Meet (IVSM-2000). It was ordered from the Architectural Bronze & Aluminum Corp. Bill and Paul A. Schweizer visited the Seneca Stone Company, which donated the stone that we picked out for mounting the plaque. The Dalrymple Company delivered the stone to Harris Hill, and Weiss Construction Company mounted the plaque as shown in the photograph on page 14.

The dedication of Landmark Plaque Number 11 took place on July 1, 2000. The program for the Dedication follows:

Bob Gaines introduces Paul A. Schweizer, Chair Elmira Landmark Committee, for Landmark Ceremony

Master of Ceremonies, Paul A. Schweizer - Introduction & Comments

Master of Ceremonies - Recognition of Hall of Fame Members, Old Timers and those who flew at Elmira Landmark sites

Remarks:

Linn Buell, President National Soaring Museum
Karin Schlosser, for Harris Hill Soaring Corporation

Simine Short, Chair NSM National Landmarks of Soaring Subcommittee
Edgar Seymour, Soaring Society of America

Floyd J. Sweet, Keynote Speaker

National Landmark of Soaring Dedication
Linn Buell, Karin Schlosser, Paul A. Schweizer, Simine Short, and Edgar Seymour

“America the Beautiful” - Checkered Flag Four Barbershop Quartet

Colors retired

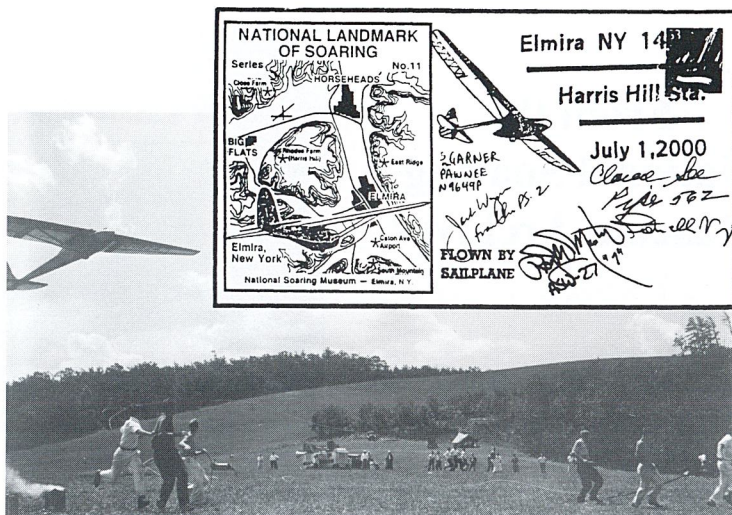
Glider Mail Flights

ASW 27 flown by Roy McMaster and Franklin PS-2 flown by Jack Wyman

Rose Petal Drop by Jeff Byard and Jim Short in TG-2

Following the ceremonies there was a reception at NSM.

Although the plaque was not completed in time for the dedication, a full-sized mounted artist's rendering was on view.



Top Right: Eleventh National Landmark of Soaring Glider Mail Cachet

Bottom: 1931 Loomis photo of a bungee launch from one of the ridges surrounding the Chemung Valley.

While the dedication program was underway, the glider mail flights by Jack Wyman in his vintage Franklin PS-2 Utility and Roy McMaster in his modern ASW 27 landed with the mail on Harris Hill. Then Jeff Byard and Jim Short, in the Vintage TG-2 military glider, made the traditional rose petal drop over the assembled crowd to add the final flourish to the dedication. This was followed with a reception at the National Soaring Museum.

The plaque was received a few weeks later and mounted on the stone. It will be a constant reminder to all visitors of the early soaring sites, before Harris Hill, that helped to establish this area as the Soaring Capital of America. It is also a tribute to the local community and the pioneering pilots who established and used these early sites.

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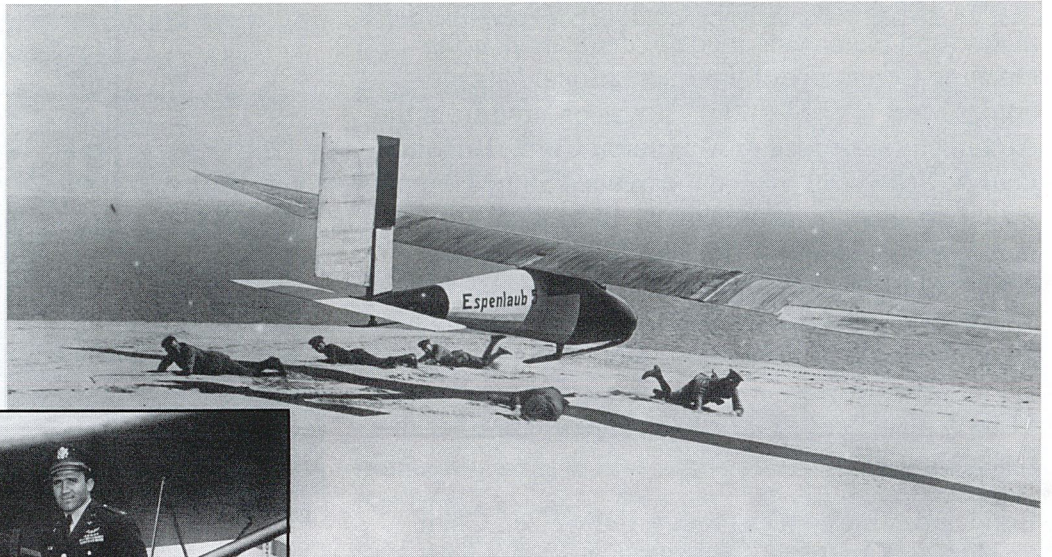
Website: <http://www.soaringmuseum.org>

Anyone is invited to contribute material and pictures with identification, about historical soaring activities, renovation of old sailplanes, soaring pioneers, unusual uses of sailplanes, etc. Manuscripts are subject to whatever revisions, additions or deletions are necessary to make the material conform to the space limitations and standards of the NSM. Material that is to be returned must be accompanied by a stamped self-addressed envelope. No compensation other than credit will be given.

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The National Soaring Museum is an affiliate of The Soaring Society of America and, as such, is the official repository for all its documents and artifacts.

From the National Soaring Museum Archives



1925-Rositten, Germany, the dunes of Kurischen Nehrung-During the third coastal glider contest.

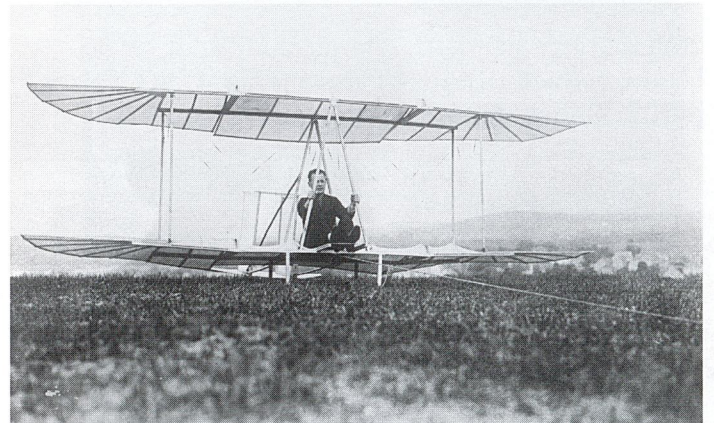
“One has to be very careful at the start. If an aircraft is not launched in the air at the first attempt with the bungee cord, then the start crew must lower their heads to avoid an unpleasant collision with the leading edge of the glider’s wings.” The author said that it was important to recruit interested young members, because many of the WWI pilots who founded the glider movement became involved in other duties, and lacked the time to participate as actively in the sport as they once had. (Our thanks to NSM Executive Director Brian Little’s father-in-law, S. Peter Kaprielyan, and Ms. I. M. Harris for this translation from *Wunder Des Segelfluges*, by Ernst Loerzer.)



A Philco Corporation PR photo taken at Philadelphia, April 26, 1946. It is captioned, “Enjoying herself at the historic take-off of the world’s first commercial freight shipment by air, is Mrs. Lily Ziegler, sister of Colonel Fred Dollenberg (r), president of Winged Cargo, Inc., pilot of the transport which towed the glider. Included in the first glider shipment were new 1946 Philco radio receivers consigned to Havana Cuba.”



After the First Flight Over the Alps, “Bern Switzerland, July 1931. Almost completely covered with snow, is this sturdy little glider that Gunther Groenhoff piloted on the first glider flight over the Alps. He took off from the Jungfrau Mountains and landed in the snow near Bern, Switzerland.- International Newsreel photo.”



1927, picture captioned, “New glider invented by German has movable wings.” The cutline continues, “Arranges so that flight of birds may be simulated. Notable advances are being made in motorless flying. The celebrated glider pilot, Hans Richter (shown) designed and built a motorless plane with movable wings which are so arranged that the flight of a bird is simulated.”