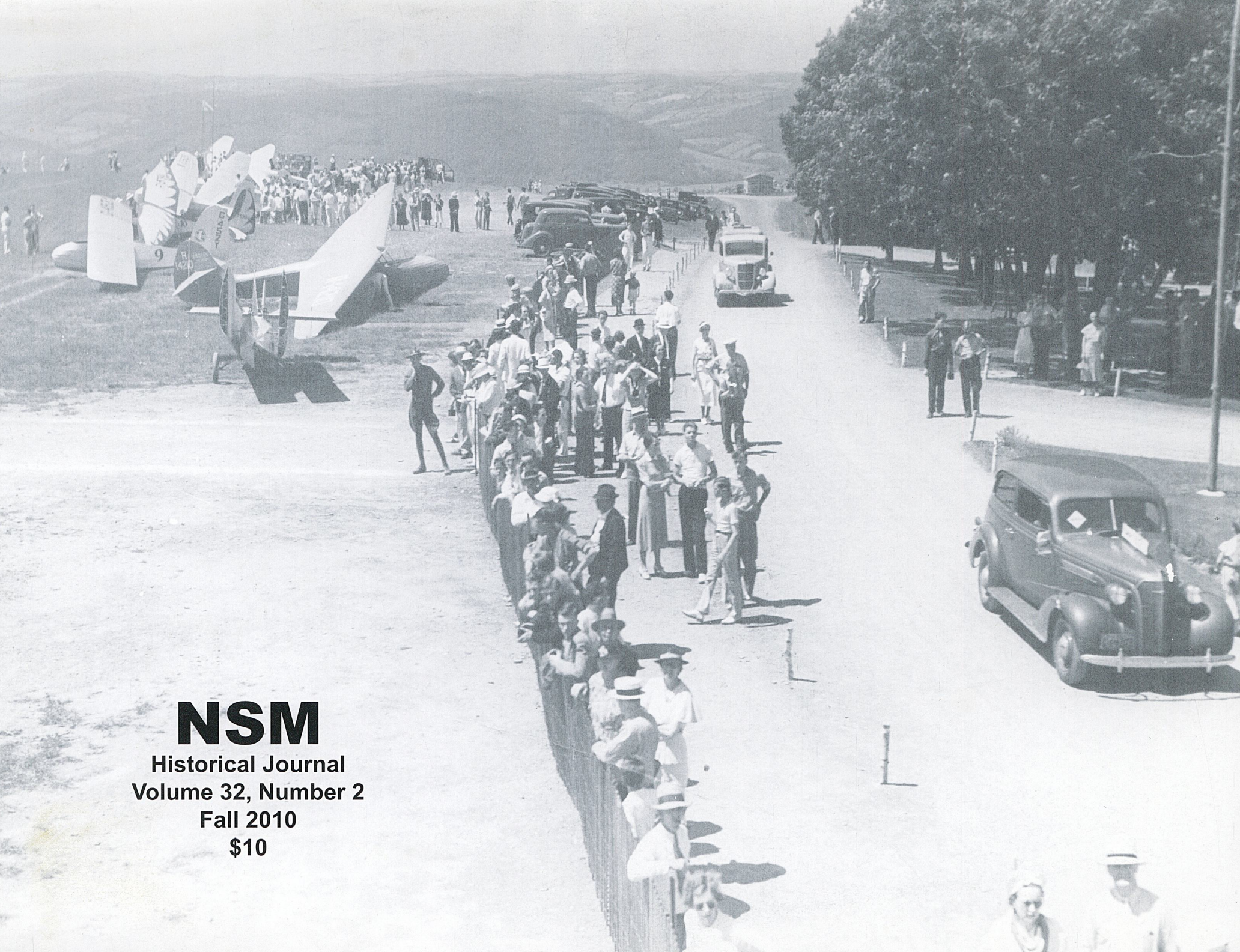




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Front Cover:

Harris Hill in Elmira, NY taken in 1937
From the National Soaring Museum's Loomis Photograph Collection

Back Cover:

Photo donated by Joe Bennis
May 1943 - Delaware River Tests amphibious glider,
probably Navy Bristol XLRQ-1,
towed by Consolidated "Catalina" PBY-5A

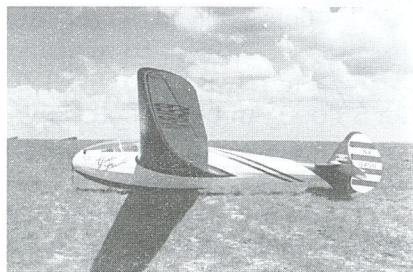
Jack Laister's Legacy

Cam Martin

Think of some American soaring pioneers (perhaps these criteria can help to direct your thinking a little bit.) I would have you think of pioneers:

1. Who became aware of soaring early in their lives through primary and utility gliders,
2. Whose interest led to participation in 1930s competitions here in Elmira,
3. Who built gliders in the 1940s for the war effort,
4. Who had a big impact on the post-war US soaring movement,
5. Who were passionately committed to the holy grail of achieving laminar airflow on metal wings and finally,
6. Whose legacy is still with us today.

Of course the first soaring pioneers to come to mind are the Schweizer Brothers. Their story has been well-documented and is well known. However these very same criteria apply directly to Jack Laister equally well.

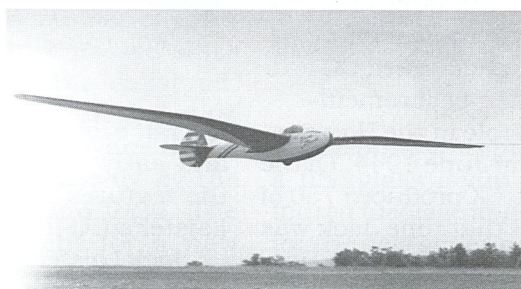


Jack Laister's Yankee Doodle

"Jack built models in high school at the age of 13, sat in a glider for the first time at the age of 14, and flew this primary (in the photo at right) in 1929. 1937 marked the first year that one of Jack's gliders participated in a national meet, the same contest where the Schweizer 1-7 was one of the winners of the design competition." While he was still in college at Lawrence Tech, he designed the Yankee Doodle, the ship honored by IVSM 2009 in its logo. The glider was built by five students under his guidance over a period of 28 weeks. Significant design features on the Yankee Doodle, which differed substantially from European practice, included a welded steel tube fuselage, a wheel and 125 mph design speed. Its gull wing was a fairly common practice and provided great aesthetic appeal. It had a 46-½ foot wingspan and weighed three hundred pounds with an L/D of 32. Yankee Doodle was an extraordinary ship, robust and high performing in aerobatics.



Jack Laister in his 1928 primary glider



The Yankee Doodle in flight

In 1939 the Aeroclub of France paid to bring it to their country for an aerobatic competition.

Immediately after graduation

Jack took a job with Douglas Aircraft in California, which prevented him from accompanying the

Yankee Doodle to France.

Jack created three sailplane manufacturing companies in his lifetime. The first of these was Universal Glider of Highland Park, Michigan, formed in the 1930s. In the 40s, along with John R. Kauffmann, he created Laister-Kauffmann in Illinois, and in the 60s and 70s it was Laister Sailplanes in California. What is not as well known is that Jack was the final owner of the name, the trademark and the designs of the Bowlus Company. He went so far as to draw up a revised Bowlus Baby Albatross

to be constructed from metal.

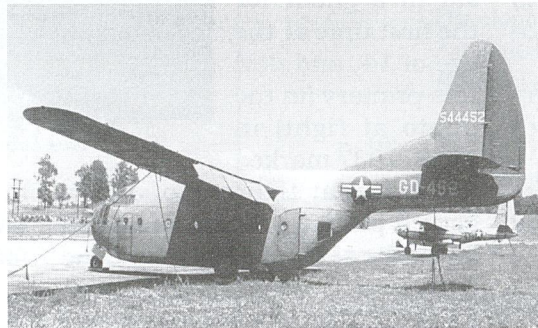
All the publicity surrounding the Yankee Doodle was sufficient to get Jack an invitation from the US military glider program to try his hand at creating a 2-place trainer based on his highly-touted Yankee Doodle. Always one for a challenge, Jack drew up a prototype in 2 weeks and built it in 90 days. Although it lacked the single seater's gull-wing, it was referred to as the Yankee Doodle Two by Laister, and TG-4 by the Air Corps. Compact, good handling and well ahead of schedule it was delivered to the Air Corps at Wright Field Dec. 2, 1941, where testing began. Laister-Kauffmann built a total of 156 of these TG-4s.

Laister-Kauffmann's real contribution to the war effort was the WACO-designed CG-4A troop glider, best remembered for its role in the Normandy Invasion of June 1944. Of the 13,909 built, LK produced 750 of them. About that time Jack was asked if he could build a British combat cargo glider under license in his factory. When he checked the plans he suggested he could do better and they accepted his challenge. From this evolved the CG-10 Trojan Horse, "unlike any other cargo aircraft of its era." Prior to this all the cargo carriers were based on passenger side loading propeller driven DC-4s and DC-5s. "When you had a cargo version (of an airliner) you would cut a hole in the side and wrestle the cargo in. Jack, starting with a clean sheet of paper, came up with what has become the definitive cargo carrying aircraft configuration:

- a high wing,
- loading ramp in the back,

- clamshell doors at the rear,
- and a floor of the aircraft to be stressed to have roll on roll off cargo."

In addition the CG-10 Trojan Horse was a higher performing glider in relation to other cargo carriers, controllable and easy to handle. However as it turned out there were only a handful of these built and the Air Force moved away from gliders. A new generation of U.S. military cargo



CG-10 Trojan Horse Troop Glider

aircraft evolved in the late 1940s and early 1950s, all reflecting the features first seen in Jack Laister's CG-10.

Jack Laister saw the potential for a post-war soaring movement. Even before hostilities ended, LK was placing large ads in *Soaring* magazine promoting the Yankee Doodle Two for civilian use. In July 1945 the company donated an LK-10 to the SSA for use as a research test bed. After the war Jack went to work to build interest in a post-war soaring movement, hoping for additional sales of LK's two-seater. However, surplus training gliders were saturating the U.S. market and selling for a fraction of what the government had paid for them. The 150 war-surplus LKs sold for just \$250 each. There was no way that a new glider could compete

in price. After the war Laister-Kauffmann was subjected to an extended financial audit of their books, and though they got a clean audit, it was not received until 1949. This kept all their assets tied up for several years and effectively prevented them from moving out aggressively into any other markets.

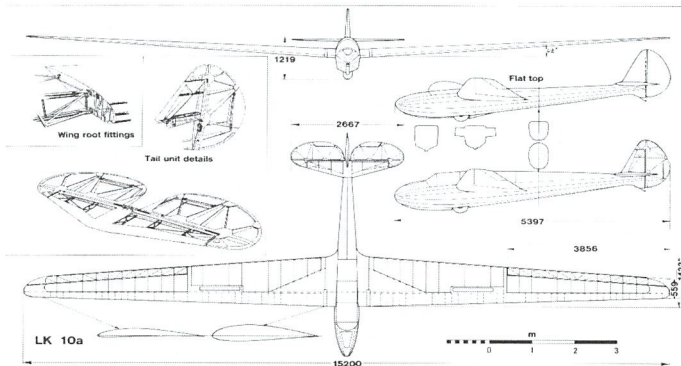
Gus Rasket of Mississippi State University conducted a comprehensive research program using the LK-10 airframe. As a result there were precise data available showing the improvements resulting from a drag cleanup and a program to reduce structural weight. This was well communicated to the soaring community (see references).

Pilots in the market for a surplus glider not only understood what could be done to make the LK a higher performance glider, but also the details on how to do it.

The LK-10 jump-started the post war soaring movement and set a high standard for performance, handling and affordability.

For their part, the Schweizers re-entered the post-war glider market with a two seat trainer, the 2-22, followed with a pair of high-performance single-seaters, the 1-21 and the 1-23. Sales of these attractive, rugged, metal gliders lagged, largely due to cost. A 1-21 needed to sell for approximately \$4,000, the 1-23 for \$3,000. An LK-10 had similar performance and yet these were selling for \$1,000.

To put all this in financial perspective: in 1953 the average weekly wage was \$70, a brand new Chevy Corvette was \$3,280. Faced with slow sales of their superior sailplanes, the



LK-10 Flat top

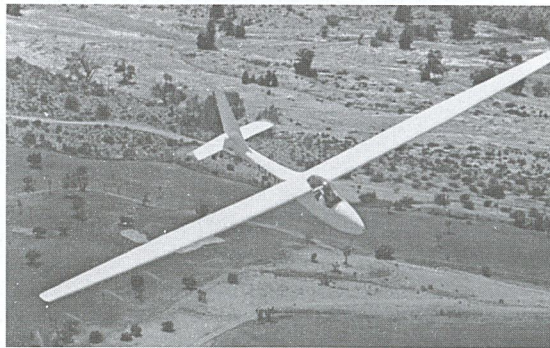
Schweizers talked to pilots, and conducted market surveys to determine what would sell in commercially feasible quantities. The verdict - a one thousand dollar sailplane with an L/D of 30 to 1 would satisfy just about everyone. The 1-26 first flew in 1954, representing the best compromise available, a two thousand dollar glider with an L/D in the low 20s.

Those familiar with the origins of the Schweizer 1-26 recognize this part of the story. What has never been stated explicitly in the narrative is where the idea originated that a high performing sailplane should cost a thousand dollars.

But consider this, the LK10 outnumbered all other sailplanes in the U.S. A lot of people were flying them and they were a very flexible platform. As a two-seater, it could be used as a club trainer. It could also be modified and put in a very competitive performance as a racer and distance flyer. There were a lot of them on the market, all selling for about \$1,000. It was the LK-10, a used war-surplus glider

that kept reinforcing the expectation that sailplanes should cost \$1,000 and deliver a reasonably flat glide. This is the glider that kept pressuring the Schweizer Corporation to find a way to do more with less. I am convinced that we would not be enjoying 1-26s today if it wasn't for the influence of LK-10. This is just another part of Jack Laister's legacy.

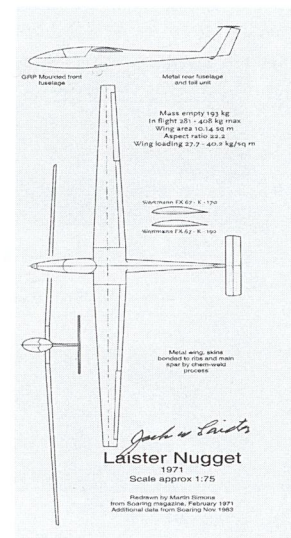
It is now the 1960s. Jack had been working first for Ford, then for Aero Commander. Over twenty years have passed since the first LK-10 was delivered. Amazingly it is still the 3rd most popularly flown sailplane in the U.S., outnumbered only by the Schweizer 1-26 and 2-22. The time seemed right for a new



LP-49 Promotional Photo

sailplane design. Jack sees that fiberglass technology is on the horizon and makes a judgment call based on the materials manufacturing research that he did for the U.S. military during the

war. He believed in the superiority and durability of metal for wing structures. Not only should it prove more durable, but also less expensive. He was convinced fiberglass skin over a core material would delaminate and consequently would not have a long service life. Production gliders with conventional wooden wing structures, like Dick Johnson's Slingsby Skylark, were still winning major contests. It seemed



a reasonable approach to use a fiberglass layup for the contoured fuselage and a metal wing for the new glider named the LP-49 or "Forty Niner." Its fuselage was the first composite primary structural part to be certified in a U.S. aircraft. Aerodynamically conventional, the LP-49 had a shoulder wing, conventional tail, upright seating, and a NACA six digit "laminar" airfoil. Jack's goal was to deliver a rugged attractive glider that would perform on a par with gliders like the successful wooden Schleicher KA-6 of the 1950s. The LP-49 was ready in 1966. The company logo and the LP-49 ads suggested this was to be the ideal glider for earning your Diamonds. The vision was for "high performance, quiet beauty and strength." But in reality the

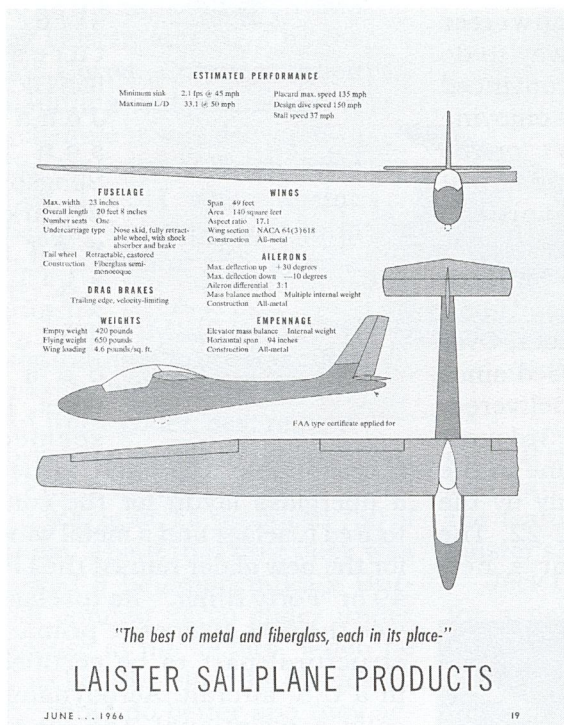
sleek LP-49 never had a chance of being a commercial success. It came to market the year after the Glasflugel Libelle entered and quickly began to dominate glider sales in the U.S. The new generation of European fiberglass sailplanes were affordable and fast and despite the predictions they were also durable. The "fiberglass revolution" had begun.

In 1969 a top U.S. soaring pilot publicly predicted that no

it with a metal wing. The LP-15 "Nugget" was Laister's response to the foreign gliders dominating the glider competitions of the 1960s and 70s. It should be remembered as Laister's best and most elegant effort. This time Jack Laister had thought of just about everything. The bonded metal wing used no rivets and these bonds proved stronger than the aluminum itself. The fuselage-mounted water ball-

last tank was at the center of gravity, giving the pilot the same quick roll response whether full or empty. It emptied in 1/3 the time of contemporary wing ballast bags. It was a pilot's dream machine. To quote Paul Bikle, "The Nugget has the most honest, solid and good feel of control, control response and stability, of any sailplane I have ever flown." In 1975 Ross Briegleb, flying a Laister Nugget, became the first pilot to win a U.S. National Championship in a U.S. sail-

plane since 1966. Third place went to an LP-15 as well. Jack Laister, along with his son Bill, had produced a real winner. The LP-15 was Laister's last sailplane design. Changes in the racing rules excluded the Nugget from future competitions, precluding any incentive for future sales. Most U.S. sailplane manufacturers had a primary business that would pay the bills, leaving the production of sailplanes as a sideline. Jack Laister on the other hand poured



American-designed sailplane could win a national title "in the foreseeable future." Jack Laister took up the challenge, and was determined to see "an American ship back at the top." He had witnessed the impact that technologies like newly designed laminar airfoil sections and water ballast were having on sailplane racing. He was certain he could design a ship to outperform the competition in achieving natural laminar flow with the new airfoils and still do

plane since 1966. Third place went to an LP-15 as well. Jack Laister, along with his son Bill, had produced a real winner.

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References

Soaring Magazine Articles:

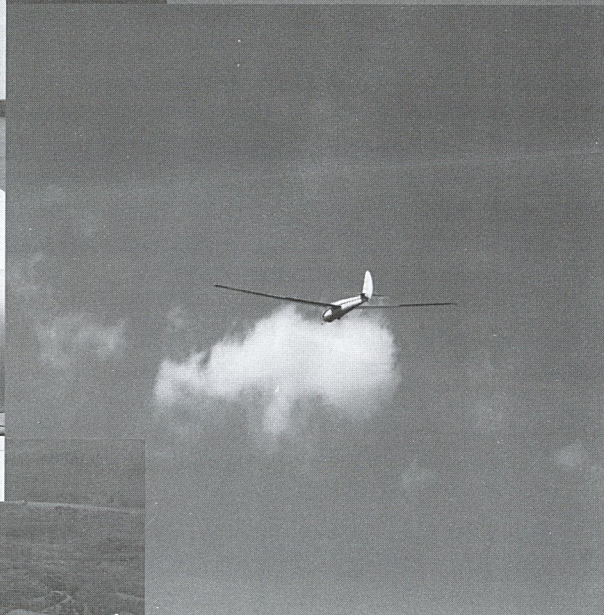
- A. Raspet: "Sailplane Performance Evaluation," May-Jun, 1947, page 6 [Performance Calculations]
- A. Raspet: "Modifying the Laister-Kauffmann," Jul-Aug, 1948, page 10 [Aerodynamics; LK]
- A. Raspet: "Technical Progress," Mar-Apr, 1949, page 4 [Atmospheric Research]
- A. Raspet: "Flight Characteristics Of The Flat Top TG-4A," Jan-Feb, 1950, page 9 [Performance Calculations; Sailplanes\ LK TG-4a]

Note:

All of Jack's designs-the Yankee Doodle, the LK-10, the LP-49 "Forty-Niner" and the LP-15 "Nugget" are represented in the National Soaring Museum's EOGASE model display.

Back In The Air After 40 Years !

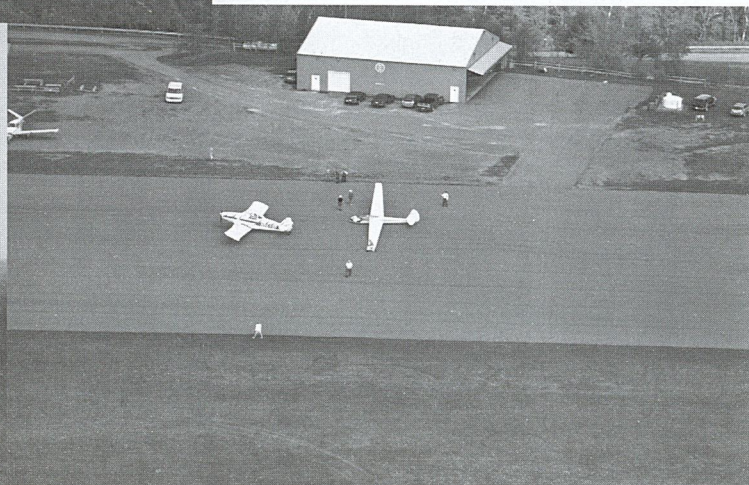
A Pictorial Account Of The Flight Of SGS 1-21 No. 1

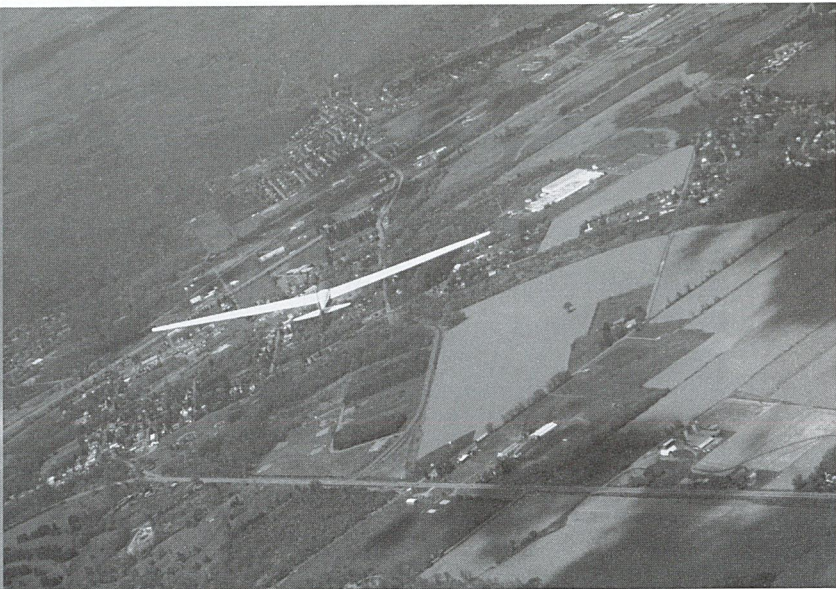


*Below-The 1-21 Prepares For
Take-Off*

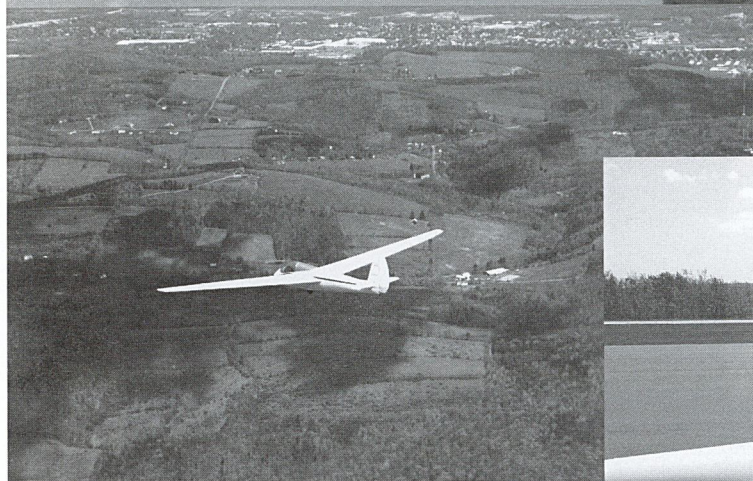


*Above-The 1-21 Takes To The Air
With Beauty and Ease*

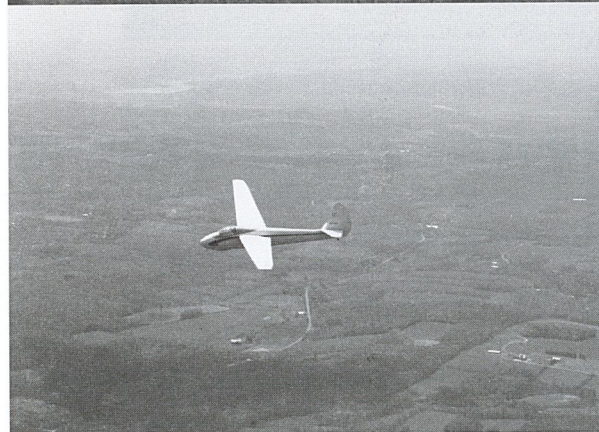




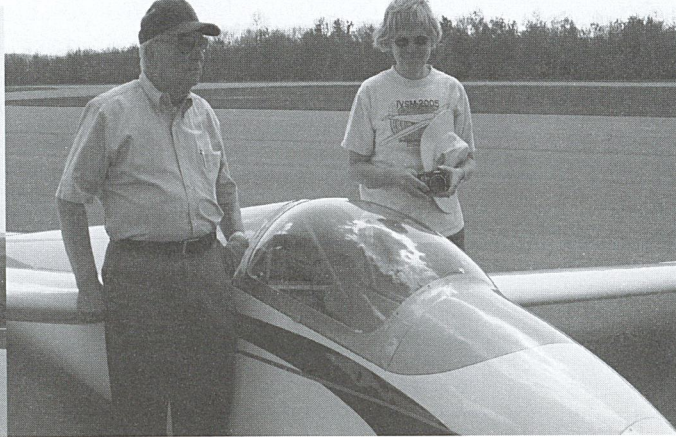
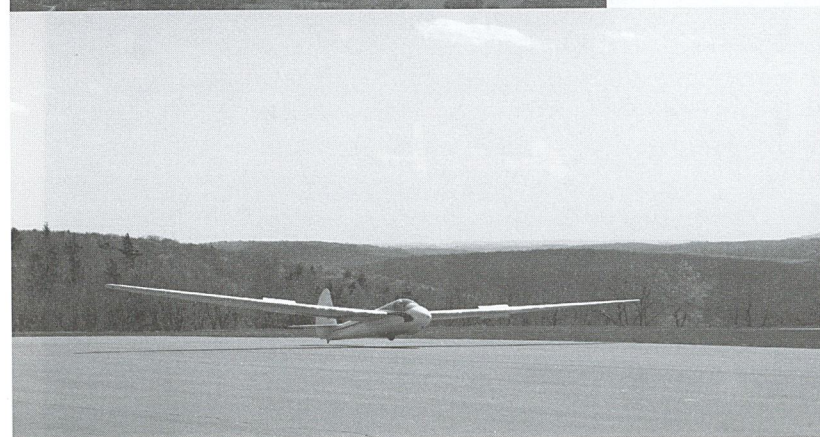
Flyng over the Chemung Valley - Home Again



Above - Bill Batesole Pilot of This Historic Flight



Below-Peter Smith Proud New Owner with Wife, Lynn



The Technology, The Concept, Building and Successes of America's SGS 1-21

Jim Short

VSA's Jim Short, a former manager of sales at the Schweizer Aircraft Corporation, and Peter Smith, NSM director and son of former national soaring champion Stan Smith, were the ideal speakers for the next segments of the National Soaring Museum's May 2010 Soaring History Symposium.

Short opened by recalling the 17 years of Schweizer utility, two-place, military and training gliders that led to the threshold concept of a competition sailplane, the SGS 1-21.

The war years curtailed sport sailplane development worldwide, but left a yearning for a modern American competition sailplane. By then the Schweizer organization had expanded, hiring and building a new facility. By war's end there were few European gliders, and those were of old design. American homebuilts were aging. The abundant war surplus training gliders were being offered at closeout prices and became the focus of American soaring. The Schweizers relied on other metal-oriented products to keep their workers and production lines open.

By 1946 the Schweizers concluded that the best airfoil for a

How The 1-21 Stacked Up

Manufacturer	Type	Airfoil	Max Glide And speed	Wing Loading Lbs/Sq. ft	Span Feet
Schweizer 1-21	SGS 1-21*	NACA 23012	29 @ 45	4.0	51
European Sailplanes					
Jacobs & Others	Weihe	Gö 549	29 @ 44	3.7	59
Jacobs/Elliots etc	Olympia/Meise*	Gö 549	25 @ 44	3.5	49
Arsenal	Air 100*	Gö 549	30 @ 44	3.3	59
Schempp-Hirth	Minimoa*	Gö 693	26 @ 45	3.2	56
Slingsby	Kirby Gull 1	NACA 4416	24 @ 42	3.9	50
Other American					
Ross-Stephens	Zanonia*	NACA 2416	28 @ 48	3.5	46
Parker	Tiny Mite	RAF 34	22 @ 68	7.4	
Culver	Screamin'Wiener*	Culver - ?	21 @ ?	4.9	36
Culver	Rigid Midget*	Culver - ?	27.5 @ 55	5.5	38

**Flown in 1947 US Nationals*

new competition ship was the Eastman Jacobs NACA 23012. In an August 1946 letter from Victor Saudek to Ernie Schweizer he recommended this airfoil, and further tests showed that this number would even have a bit of laminar flow on its lower surface. The hope was to build a performance sailplane with modern materials that would be in the same class as the Weihe. It would be constructed of modern materials for superior durability and planned for serial

production. Schweizer's answer was the SGS 1-21. It was all metal except for fabric covering the movable parts. The 51 foot straight tapered wing was very thin for its time, giving low drag at high cruising speeds. It also had good lift at high angles of attack and hence low stalling and landing speeds. Its most unusual feature was carrying water ballast in the wings. German experts proposed the idea of fuselage tanks in 1934, but it had rarely been used in practice.

An American Competition Sailplane, The Schweizer SGS 1-21 Peter Smith

National Soaring Museum Director Peter Smith, son of noted early champion sailplane pilot and international competitor Stan Smith, delivered the program's next talk on one of America's outstanding competition sailplanes, the SGS 1-21 and those who flew it into sailplane history.

In 1946 the government sold off its military trainers at bargain basement prices. The Schweizer Aircraft Company found itself struggling to keep its glider business alive. The Schweizers reasoned that pilots who trained in these low performance ships would be ready for and want a higher performance American made, single-place mount more competitive with other WWII ships. A formal proposal



Stan Smith

was made to the country's top soaring pilots. The 1-21 was tentatively priced at \$2,700 and had a glide ratio of over 27 to 1. It would be the first glider to be equipped with water ballast wing tanks.

Number 1 was bought by Dick Comey, then general manager of the Soaring Society of America. "Despite being a relatively inexperienced pilot, he won the 1947 Nationals," Peter Smith said. However the price was too high for the market and only two 1-21s were built.

Year (Nationals)	Placing	Pilot	Location
1947	1	Dick Comey	Wichita Falls, TX
1948	8	D.Comey/Frank Hurtt	Elmira, NY
1949	2	Dick Comey	Elmira, NY
1950	2 (Women's)	Ginny Bennis (Schweizer)	Elmira, NY
1953	2	Stan Smith	Elmira, NY
1955	6	Stan Smith	Elmira, NY
1956	6	Stan Smith	Grand Prairie, TX
1957	1	Stan Smith	Elmira, NY
1963	13	Stan Smith	Elmira, NY
1965	28	Stan Smith	Adrian, MI
Year (World)			
1952	31	Stan Smith	Spain

Comey loaned the 1-21 to Ginny Schweizer who set a women's distance record at the 1950 Grand Prairie Nationals.

Stan Smith bought No. 1 in 1952. It was factory modified for him with a lowered canopy in preparation for the upcoming contest in Spain. The infrastructure at that time in Franco's Spain was very poor, with bad roads and Unimog vehicles unsuitable for towing. The Americans were late arrivals, but other pilots had up to two weeks advance practice. Stan missed the first day making trailer repairs. He finished 32nd of 39, with MacCready's 1-23 7th, Paul Schweizer's 1-23 18th, and Dick Johnson's RJ-5 24th.

A 1953 Nationals incident at Idlewild was notable in that it had far-reaching results. The 195-mile goal flight from Elmira was complete as Stan circled the tower awaiting the green light to land, then came Steve Bennis, then Nick Goodheart. All landed

on a taxiway only to be greeted by a furious airport manager accompanied by a phalanx of other officials. Peter Smith said that ever since that explosive confrontation there has been a NY/NJ Port Authority rule that makes landing a glider at any of their airports prohibitively expensive. "To a 15-year-old crewman riding in a car towing a glider trailer across Manhattan, it seemed weird," he said.

Six pilots flew from Elmira to Wilmington, DE, a distance of 177 miles, during the 1955 Nationals. A photo shows the six: Stan Smith, Bob Smith, Kemp Trager, Nick Goodheart, Bill Ivans and Steve Bennis, with employees of All American Engineering (AAE), the company founded by Richard DuPont. A few years later Peter's father became VP-Engineering at AAE.

Peter and his Aunt Marion often crewed for Stan. They always timed themselves and de-rigged the 1-21 quickly. After

Soaring History Symposium 2010

Stan's 246-mile flight to Barre, MA from the 1957 Nationals in Elmira, "Dad said, 'Before we take the ship apart, go over to that little shack and tell them what size lobster you want for dinner.'" But Stan wasn't through yet. At the same contest on a fickle day when the next-best flight was just over 32 miles to make a contest day, rain shut down the operation, but not before Stan Smith in the 1-21 got away and rode a wave 79 miles mostly in cloud, to his goal at Syracuse. "Of course what I remember about that day," Peter said, "was arriving back at Harris Hill and seeing the scoreboard and Stan Smith in first place by a considerable margin."

On the last day of the '57 Nationals, with an open task called and a good weather forecast,

Stan set his goal to radio personality Arthur Godfrey's farm/airstrip in western Virginia. He took off leaving Aunt Marion and Peter crewing, heading in that direction. "Hours went by," Peter said. "It was now early evening and I think that we were in or near the Shenandoah Valley." After several phone calls, they learned that, due to a more westerly wind shift, Stan had changed his goal and landed 230 miles away at Atlantic City. The trackers got there around midnight and faced an all-night retrieval to Elmira. But he won the contest. He made many more distance flights in the 1-21 after that, including a 184-mile Delaware state goal and distance record. "That may still stand," Peter said.

Stan Smith owned the 1-21 for 16 years. In his soaring

career he flew over 50 different gliders, but this is the ship with which he is mostly identified and made his greatest achievements. In 1968 he sold it to Allan MacNicol, who flew it at Mt. Washington for his Diamond C altitude.

Bob Burchard had been restoring it for the last several years and during the last few months Bill Batesole finished getting the 1-21 ready to fly. Bill was the guy who nudged both John MacNicol and Peter to make a deal, "and I'm very grateful to him for that," Peter said. He added, "I'm also grateful to John for offering it to me at a price I could afford."

Eventually it will come to the National Soaring Museum, "but it needs to fly a bit more," the new owner said.

Modern Day Flight Testing of Pioneering Wright Gliders

Klas Ohman

Kitty Hawk, North Carolina was witness to the Wright Brothers' aircraft replicas skimming over the blowing sands in 2002 as they prepared for the 2003 "first flight" centennial celebration.

Lt. Cmdr. Klas Ohman, a Navy test pilot and F-18C pilot aboard the aircraft carrier USS Kitty Hawk, appropriately was delegated to test and evaluate replicas of the Wright Brothers' inventions for the US Navy at the

historic locale where they originally occurred. The 2002 trip was for both public relations and flight testing.

Ohman has flown 57 different types of military and civilian aircraft, fixed wing land and sea, rotary wing and sailplanes, and has made over 650 arrested landings on 12 aircraft carriers for "around 2,500 hours total time."

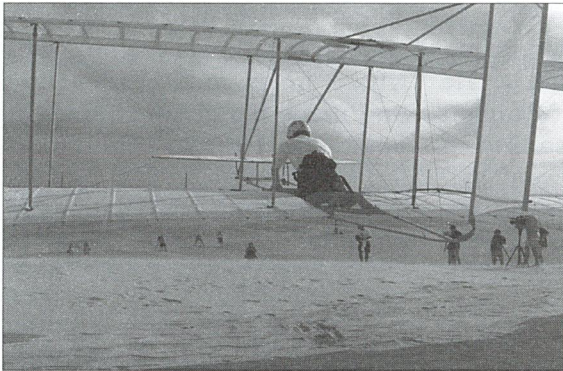
The builder was the Wright



Klaus Ohman In Flight at Kitty Hawk

Brothers Aeroplane Company of Dayton, Ohio. Nick Engler, master craftsman and aviation archeologist, gave up a very successful home improvement

Soaring History Symposium 2010



*Pilot taking off over dune,
Note foot steering*

career to build a replica of each Wright aircraft: the 1899 Kite, 1900/01/02/02.5 gliders and the 1903 Flyer. He financed this by doing static displays of the aircraft. In 2002 there were two military pilots and one civilian test pilot. "In 2003 there were seven of us which becomes an issue when you have an aircraft that only flies for about 30 seconds," Ohman said. "Trying to actually get time to fly and repeatedly move on is tough when you have that many folks." They put these replicas of pioneering Wright aircraft through tests "that we feel mimic those that the Wright Brothers must have performed themselves," Ohman said.

Ohman felt that a lot of the Wrights' passion for flight came from Otto Lilienthal and the engineering of Octave Chanute. "They were in an incredible 'arms race' with the publicly-funded S.P. Langley, with not very much support or funding on the Wright side," he said.

How did they do it? Unlike a lot of other designers, they used the scientific method and moved step by step. "They were very very stubborn, athletic

and also fairly lucky," Ohman said. Why Kitty Hawk? The dependable wind and "site sensitivity of their aircraft." Just like today's aircraft builders the Wrights did not want others to know what they were up to. They wanted to experiment and fail in private and "not have people

watching them and have embarrassing issues like the Langley crew did (crashing) off the front of the (launching) boat."

What was unique about the project was that the Wrights are among the few people in history to write their own account with recorded notes. "Up until the Flyer it was pretty much them reporting on themselves. They would take notes and go on. The replicating group was going to emulate their method, start out gliding and then proceed to the 1903 power flying machine," Ohman said.

They began with the kite, where they proved the issue of wing warping. That went back to Lilienthal who died in an 1896 stall/spin accident because his aircraft was too stable and lacked movable controls.

Ohman said, "The first controlled and sustained powered flight was arguably the single most important transforma-

tional world event of the 20th century. What enabled two Dayton, Ohio bicycle builders to succeed where many others had tried and failed is almost incredible." The overview involved the project's motivational and historical backgrounds, the 1902 (and 1902-½) glider trials.

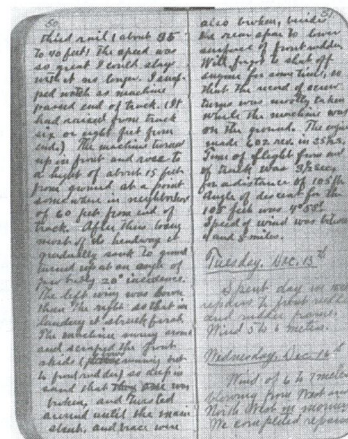
The Wrights' two part problem was (1) the flight must be powered and sustained, not gliding but taking off and landing at the same elevation; and (2) the flight must be controlled by the pilot, that was critical. Ohman said, "Perhaps some details of their flight test program and the exact physical properties of their aircraft might not be recorded precisely as they existed."

The trials were conducted between October 4th and 8th 2002 in Jockey's Ridge State Park, North Carolina, and October 1st and 12th 2003 in both Jockey's Ridge and Currituck County Airport, North Carolina.

Even a pilot of such diverse aircraft as Ohman has to make unique

first flight preparations – hang glider training, hang glider helmet and clothing that allowed freedom of movement. Tethers for hang glider initial flights were used the same as with the Wrights' kiting of 1902, along with the nominal wind speeds recorded in the Wright Brothers' daily notes.

The Wrights' first attempt at a device large enough to carry a



Wright Brothers' Log

Soaring History Symposium 2010

man was the 1900 biplane glider. The wing area was found to be barely enough to support a small boy, but the basic ideas they had for kiting control would work. Then followed the 1901, still utilizing the Lilienthal tables of lift. It had much thicker, expanded wing areas. The results of second attempts using Lilienthal's tables also were disappointing.



Truck Mounted Gimbal With Wright Glider

The glider sank excessively and the pitch attitude was difficult to control. The Wrights realized that the Lilienthal tables were erroneous and devised a wind tunnel for measuring the lift and drag of various airfoils. They made it non-dimensional so you could take a model, blow it up and still get an accurate result. The Wrights were going to start out gliding and then move to the '03 power machine.

Ohman's group started with the '02 glider. The 1902 was an anhedral biplane wing with a span of about 32-feet and had a canard configuration. The Wrights chose the canard because of Lilienthal's experience crashing face first in a device that was essentially too stable. They wanted some structure in front of them to help absorb the impact when they crashed. They

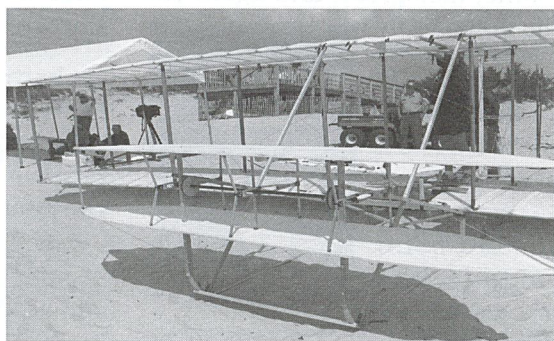
also wanted theirs to be unstable to overcome side gusts, and they knew that a canard would do that. "After determining the optimum airfoil, aspect ratio, configuration and interplane spacing from their wind tunnel results, the brothers produced a very effective gliding machine in the 1902 Glider," Ohman said. With their canard not only does the surface rotate, but the camber changes as well. He commented that you hear a lot of people claim to know exact details of the Wright Flyer, and of the gliders somewhat less. What were these measurements and specifications? It seems there's much open to interpretation.

It was known that the Wrights tethered some of their aircraft, so when Ohman's group started to hang glide, it was done with tethers. On his first flight he was thrown off the hill with tethers on each side. With no propulsion the canard doesn't fall forward or backwards, it just parachutes straight down.

He described the 1902 replica's anhedral (drooping) biplane main wings. Ohman said, "Why anhedral wings? We found out the Wrights always flew down the dune with the wind coming up the dune. When this louvered wing drags, it rotates the windward wing into the wind. If you had a dihedral biplane, that would be up facing the wind and is light enough it would blow the thing over on its side. With the

anhedral, the windward wing digs into the sand just like the louvered wing, so it won't roll over on you while your launch crew is coming over to help you pin it down and get out.

The replica 1902 had a mechanically mixed aileron/rudder and weighed approximately 120 pounds empty. The center of gravity was approximately 25% of the mean aerodynamic chord, a stall speed of 18 to 20 mph, speed never to exceed about 28, flies nicely at 26 mph and the pilot was in a prone position. "What was authentic?" Ohman asked. "Springs were added to the canard to dampen the flutter." By now they were joined by the Army and Air Force, "and we were starting to compete for distance. Everyone had a different launch style - some would trade for speed and skim over the sand, others would rather pop up and let it go for maximum endurance. They also modified the cradle for easier movement.



The 1902.5 Glider Replica

Each of the Wright replica pilots had approximately 25 flights. They found the '02 replica to be unstable ("very twitchy"). Ohman said, "The canard itself was unstable with incredibly light forces and once

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you get it moving, if you turned it loose it would go full deflection. In the lateral directional axis it was very unstable, very sluggish with low roll rates and roll forces. They nailed the mix on rudder and ailerons. You put the hip roll in and it would exactly coordinate the amount of rudder you needed for no adverse yaw." This was the glider that the Wrights learned to fly on.

A year later they returned to test the 1903 power plane, however it had been held up in production so they took what was to be a static of the 1902.5 and made it a flight display. Ohman pronounced this plane a "pretty cool flying machine." It was basically a 1902, but with flight controls. "So then think of it as a 4/5th scale model of a 1903 without the engine. Add another 14 pounds, move the seat forward a little bit, which made it fly a little nicer, stall is about the same, flies great, and again you lie down to fly it." He said it was

a lot more predictable than the 1902. With this and 1903 the front plane of the wing was fixed, but the outboard panel of the wing could move up and down, giving more control power, but



Orville and Wilbur Wright

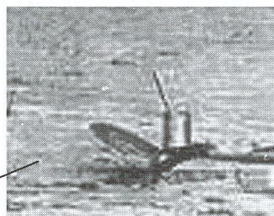
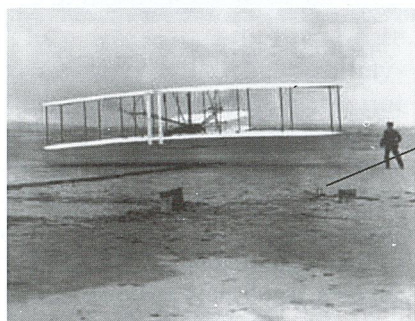
as soon as this touches, you are no longer rolling the airplane, you are down.

Ohman felt that the flight test program was incredibly rewarding, similar to current programs and "very similar to what the brothers went through in their time. The big difference being that it was not yet known if powered flight was

even possible, and they did all the work by themselves. One thing that the Wrights had that the test team did not was a small amount of time to wait for the best conditions. The builder had to use the 1903 replica as a static display for his income. Scheduling delays from the builder and aircraft availability, FAA inspections, required repairs after each attempt, all resulted in the test team's time being extremely compressed." Ohman said that the overall conclusion through replication of these Wright tests was "the opportunity of a lifetime to

gain a unique insight into just how they flew. Given the experience, it was surely only a divine combination of determination, scientific method, stubbornness, skill, athleticism and just plain luck that allowed the Wrights to succeed and change the world forever one cold December morning a century ago."

A Piece of Wright Brothers Trivia



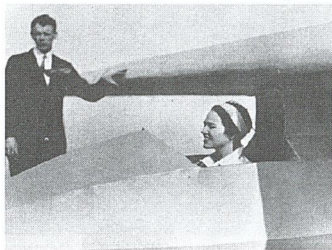
In parting, Ohman offered his audience a bit of trivia on the famous Wright Brothers photo.

He called attention to the water bucket with a paintbrush sticking out of it on the ground along the launching rail. The Flyer's untreated exhaust came directly out of the engine onto the pilot's right leg. It was 30 degrees outside so whichever Wright was the pilot had his right leg painted with water to keep the woolen pantleg from catching fire.

US Women In Soaring And The Women Soaring Pilot's Association

Frauke Elber

Frauke Elber recalled one of the conditions imposed on Germany by the Versailles Treaty ending World War II - power flying was forbidden, or at best severely restricted.



Anne Morrow Lindbergh

Motorless flight enjoyed a revival among young air-minded Germans and soon caught on nationwide.

The movement spread to the United States where five women are credited as being the first women soaring pilots: Anne Lindbergh (wife of Charles), Guinevere Kotter, Maxine Dunlop, Peaches Wallace and Ruth Alexander. Their enthusiasm resulted in



Peaches Wallace

the formation of the Anne Lindbergh Club in 1929. The 1930s saw women participating in soaring contests. In 1947 Virginia Schweizer became the first American woman awarded the Silver C. Elber said that, "In the 1950s when there were only

a thousand registered glider pilots, women's participation in the sport reached its highest percentage and performance levels." Percentages of women's silver and gold badges declined in the 1970s reflecting a lessening of participation.



Guinevere Kotter



Maxine Dunlop

During the 1950s Betsy Woodward claimed an altitude record while participating in the Sierra Wave Project research, and in 1952 became the first American woman gold badge holder. The first woman awarded the diamond badge was Helen Dick in 1967. "In 1979 and 1980 two women moved to the forefront. Sabrina Jackintell flew a

new feminine world altitude record of over 42,000 feet, which stands to this day (May 2010). Doris Grove became the first woman to break the 1,000 km barrier. As of this writing three American women have done so," Elber said.

After a 33 year struggle, in 2001 the FAI (Federation Aeronautique Internationale) finally recognized Women's World Soaring Championships. With the

exception of Liz Schwenkler and Kathy Fosha very few women in the United States are participating in regional and national contests. Schwenkler made history when she became the first woman to win the US Open Class Nationals at Hobbs, NM in 2006, and finished third in that class the following year.

Overseas the question is frequently asked why no American women participate in the Women's World Championships. Elber said that percentage-wise there are fewer US women sailplane pilots than in most European countries. These few are spread over a very big country, from east to west coasts and they have little chance to meet,



Ruth Alexander

interact or train together. "By contrast powerhouse nations of Europe have well-structured training and support systems in

place for both male and female pilots," Elber said.

In 1972 to start more interaction among US women glider pilots, Bertha Ryan, later a recipient of the Majewska Medal (the highest international honor for women) distributed a survey among US soaring clubs to determine how many women glider pilots there were. "Encouraged

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by the response," Elber said, "Bertha started a newsletter



Helen Dick

that evolved to the now quarterly *Hangar Soaring*." It became the medium for new ideas and inter-communication among women here and abroad. Bertha Ryan's initiative led in 1978 to the formation of the first week-long, annual Women Soaring Seminar. Scheduled meetings are held at different US locales to insure widest attendance by women. These seminars resulted in the 1986 formation of the Women Soaring Pilots Association to encourage and support women glider pilots.

Elber said, "Over the years private donations and grants made it possible to establish scholarships to support young (and not so young) pilots and help defray costs and training." The organization has since grown to over 200 members (men and women) in 10 countries.

In 2009 the FAI honored an American for only the second time, Doris Grove, with the Pelagia Majewska medal for dedication and achievements in soaring. That summer, after four years of planning, the WSPA seminar took place for the first time in Europe in Lesce/Bled, Slovenia. Of the 48 participants 21 came from the US.

"At the 2010 soaring convention in Little Rock, AR, women reached a high level of visibility," Elber said. Diane Black-Nixon was awarded the Warren E. Eaton Memorial Trophy (the highest of SSA). The WSPA became the first organization ever honored with the Exceptional Service Award for promoting soaring and its international work. Kathy Fosha had six national records awarded, Cindy Brickner and Valeria Paget, each received one. Paget's record was also

recognized as a world record in the World Class category. Kathy Taylor was recognized for scanning back issues of *Soaring Magazine*.

Elber closed by listing the scholarships which are currently awarded and administered by the WSPA: the

Anne Briegleb Scholarship, the Gross Sky Ghost Scholarship, the Competition Scholarship, the Maria Faber Scholarship, the



*Hall of Fame members left to right:
Bertha Ryan, Ginny Schweizer,
Doris Grove*

Mid Kolstad Scholarship, and the Flying Montagues Scholarship. "In addition," she said, "WSPA provides a \$300 grant to a young female student participating in the Eileen Collins Aerospace Camp conducted every summer by the National Soaring Museum."



*Ginny Schweizer and
Liz Schwenkler*



Tin Soldiers vs Glass Slippers How Competition Sailplane Development And Innovation Shifted From America To Europe

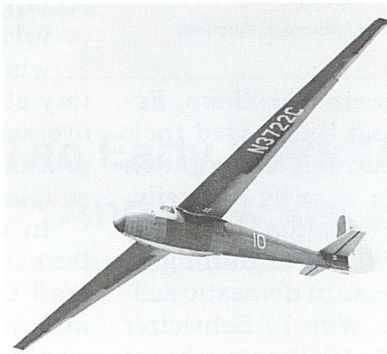
Russell Lee

“During the 1950s, two West German designers invented a sailplane airframe made from a composite of fiberglass-reinforced plastic, or FRP, and then combined this technology with laminar airfoils developed in the USA. This combination evolved into sailplanes with such streamlined contours that entering their cockpits came to resemble donning a pair of ‘glass slippers.’ This paper focuses on how these disparate ideas came together, and why the primary manufacturer of aluminum sailplanes, or ‘tin soldiers,’ in the USA, chose not to develop its own line of FRP sailplanes,” said National Air and Space Museum curator Russell Lee in his talk at the National Soaring Museum’s Ninth Annual Soaring History Symposium.

During WW II, Reimar Horten designed experimental all-wing aircraft, utilizing laminar airfoils to increase sailplane aerodynamic performance. No other designers followed up along those lines until American builders Dick Johnson and Harland Ross built the RJ-5. They utilized the post-war National Advisory Committee

for Aeronautics (NACA) airfoils developed specifically for low speed applications. In 1950 they brought the RJ-5 to the Mississippi State College flight research laboratory in Starkville, MS, where Dr. August Raspet was teaching.

For two years Dr. Raspet guided a team that carefully examined the RJ-5. Lee quoted Raspet who explained, “In particular, the importance of wave-free contours was found to be of utmost importance by the series of profile drag measurements made in flight on the RJ-5.” The RJ-5’s L/D was boosted from



RJ-5

30:1 to being the first sailplane in the world to attain 40:1.

As Lee said, “Raspet’s work filled the void between the

wind tunnel and the workshop. He unmasked and overcame aerodynamic obstacles holding these airfoils short of their theoretical potential.” Johnson’s record-breaking national and international success with the RJ-5 and the laminar wing was recognized in

Europe. Though the progression of these new airfoil concepts is difficult to trace, Raspet clearly played a vital role in bringing the knowledge to Europe. His son David recalled, “As a member of the Organisation Scientifique et Technique du Vol a’ Voile (OSTIV), [my father] travelled extensively in Germany where I’m sure that he had contact with (Richard) Eppler.” Eppler helped to design the first successful sailplane constructed entirely of FRP.

In 1952, Hermann Nagele asked countryman Eppler for assistance in designing a new high-performance sailplane. After three years of experimenting and evaluating combinations of fibers, Nagele finally built the Phönix sailplane using balsa cores covered with fiberglass-reinforced plastic. It was Eppler who started refining NACA airfoils, and finally came up with a mathematically derived profile to fit more closely the relatively low-aspect, lightweight configuration from which the Phönix evolved. Raspet said that only by combining these technologies could the two designers have created a sailplane with such superior performance.

Besides the aerodynamic benefits, the production process was faster. Editorially, *Flying* magazine commented that Ger-

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man workers could produce FRP sailplanes faster, with fewer parts, and with less labor cost than American workers building aluminum sailplanes.

The regulatory bias favoring the classical wood and aluminum materials used to build aircraft in Germany was erased in 1951. FRP construction acceptance moved through the appropriate post WW II bureaucracy levels. It was seen as an important step in returning Germany to its preeminent role in motorless flight research and development during the 1920s.

In 1959, two years after its first flight, the Akaflieg Stuttgart lent the glider to Raspel at Mississippi State for evaluation. To Nagele's disappointment Raspel found the wing surface (in his words) "rough enough to have a serious destabilizing effect on the laminar boundary layer." The Raspel team worked to reduce the waviness by an order of magnitude, from seventeen thousandths to two thousandths of an inch. This treatment dramatically improved performance. Raspel delivered a paper at the 1960 OSTIV annual meeting in which he said, "No airfoil has ever before been reported, which according to full scale free flight data had such low drag, such high lift coefficient and such extensive boundary layer flow." He attributed this performance to, "the new fiberglass-balsa sandwich construction of the Phoenix which provided ultimately smooth and wave-free surfaces."

Lee said that within a few years a flurry of new fiberglass

models soon dominated European contests before moving inexorably across the Atlantic to cast their sleek shadows on the United States. He pointed out that the West German government subsidized the sailplane movement. American design and manufacturing capability was nearly wiped out after WWII when the War Department dumped more than 1,000 surplus military gliders on eager civilian takers.



*Phoebus
First successful fiberglass sailplane*

The Schweizer brothers, Ernie, Paul, and Bill guided their Schweizer Aircraft Corporation through the glut by diversifying their production lines. By 1953, they were beginning to see an increase in domestic sailplane sales. With 77 Schweizer aircraft sold, 1962 saw a boom in the popularity of sailplanes. Their market share however began to slip. "Costly tooling and manufacturing work which was required to build what Bill called a "unique but expensive to build, luxurious three place sailplane, the SGS 2-32, not based on sound business strategy, but emotional attachment

to soaring." Despite financial losses on the 2-32, SAC thrived. Lee said Paul remembered that, "Not until 1965 did the company begin to consider seriously the new material. But by that time European manufacturers had taken 40% of the American sailplane market." Serious doubts still existed concerning the manufacture of FRP sailplanes. As Paul Schweizer said, "The matter was not simply one of certifying a new aircraft design. Fiberglass construction hadn't gotten into structures in the (mainstream) aircraft industry at that point." Failure of the Dow Chemical Company's FRP constructed Windecker Eagle and the millions spent on its development and certification convinced Paul. "The FAA was so conservative that you would have to build (the structure) much heavier than you really should have."

How could the FAA simultaneously choke domestic development of FRP sailplanes, while maintaining a regulatory atmosphere so benign that overseas manufacturers could profitably export and sell FRP sailplanes to pilots in the USA?

In addition to the regulatory bureaucracy, the Schweizer Aircraft Company was faced with monumental medical liability and compensation costs. The Schweizers believed that they could not build an FRP sailplane roughly competitive to the European types for less than \$15,000 to \$20,000. Their wage rates were two to three times higher than the Germans. "Yet, the Europeans sold their gliders in the USA for approximately \$6,000 to \$13,000, shipping included," Lee

said. European builders had another advantage in that they could make minor aerodynamic modifications on these FRPs, and still have asthetically appealing sailplanes. Bill Schweizer said that, "Many US pilots bought the sleek European ships as a status symbol."

Schweizer continued to make sailplanes through the 1970s. In the face of a severe 1980s recession the market for civil aircraft collapsed and Schweizer ended sailplane production in 1982.

Leonard Niemi, inspired by the RJ-5's performance, designed the aluminum-built Sisu in 1952. He first flew it in 1958, then built 10 of the production version. By 1964, Niemi's Sisu ranked among the best competition ships in the world. But to achieve peak performance, fillers and considerable effort to smooth out external surfaces



*Sisu
Hanging in the NASM*

were necessary due to constant wing flexing. Championship sailplane pilot George Moffat said, "A metal sailplane is only as good as the plaster job on its wings and tail surfaces. Constant wing flexing causes cracks that require endless filling and sanding...one hour of work for each hour of flying." Considerably less effort was required to maintain the finish of an FRP glider.

Lee closed his talk saying, "By 2010 sport sailplanes could fly as far as 60 Kilometers horizontally without losing more than one km. of altitude thanks

to FRP airframes fitted with laminar airfoils. However, this level of performance is only available to a relatively small group of pilots who have the financial means to own and operate these aircraft and over the years manufacturers

have increasingly catered to this group. The obsession with higher glide ratios has gripped the sport soaring culture for the last several decades and left few good choices to the thousands of casual 'weekend flyers' interested in affordable recreational sailplanes" (Witness the 20% decline since 1983 in the Soaring Society of America membership).

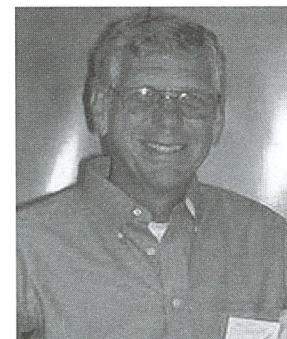
Perhaps the quest to improve sailplane performance using ever more efficient FRP airframes and laminar airfoils has become what Reinhard Rurup would describe as "no longer a means, but an end in itself."

On The Early Days Of Our Gliderport And How We Got Started

Tom Knauff

Like many young people growing up, Tom Knauff was fascinated by flight, to be airborne, even vicariously by building model gliders. During his adult years his interest and experience expanded as he became one of the pioneers of Appalachian ridge soaring, a

world famous flight instructor, teacher, lecturer, writer, and aviation businessman. He set five world records, 45 national records and published seven books. Both he (1997) and his wife Doris Grove (1980) were elected to the United States Soaring Hall of Fame.



Tom Knauff

Schweizer Homecoming 2010

early 20s. "So we had other things to do," Bill said. The second generation includes Bill's sons Stuart and Paul, and Les, Ernie's son. All were glider pilots at 14 and now are aero engineers and power pilots.

For the 50th anniversary of their company the Schweizer brothers built a replica of the 1930 glider. "Even with a 1 to 8 glide we were all amazed at how well it flew."

The glider that they learned to fly on was called "The Brick" (SGU 1-3). Bill smiled when he recalled, "It had this Durand 24 airfoil with a sharp leading edge. When you put it into a dive it wouldn't pick up speed, it would just drop."

Their first gliders were built in the barn at their Peekskill home. In 1939 when the company moved to Elmira Heights, they occupied the warehouse third floor and cellar of the Elmira Knitting Mill. Their first real order was from the Air Hoppers Glider Club of Long Island. The club wanted a two-place glider for passengers and to get people involved with soaring. Ernie designed the SGS 2-8, "and we priced it at \$1,000." The 2-8 later became the military-modified TG-2.

They received two more orders and the following year Elmira Industries was looking for someone in Elmira to build gliders. "So they gave us incentives to locate in Elmira. I was still in college at the time, so Ernie and Paul came here and that was the beginning of the Schweizer Aircraft Company." The next big problem arose when the CAA (forerunner of the present Federal Aviation Administra-

tion) required certification for the ships already delivered.

After the German 1940 and 1941 assault glider success in Belgium and Crete, Bill said that the US Army Air Corps (forerunner of the US Army Air Force and the US Air Force) "decided that it was time to get in the glider business. And we happened to be the only company making two-place gliders." They got an order for 50 to be built as fast as possible. At the time they were only building one every 3 or 4 months. Soon 75 SAC employees were completing one glider a week. "In August 1943 they cancelled the order in favor of engineering three-place Aeronca, Piper and Taylorcraft aircraft. They had glide angles of about 1 to 8, much lower than the TG-2 and 3A's 1 to 22, but very similar to the big Waco CG-4As that glidermen would fly in combat. Some of the slack was taken by the production of the belly section of the Curtiss C-46 cargo plane, using rotating jigs. It was a new more efficient and time-saving technique developed at Schweizer. When the war ended they were ready with the SGU 1-19 for single place training. By March 1946 they had built 57, "But unfortunately we only sold 2." The Army had released all the wartime training gliders (TGs) and were selling them, "for about \$100 to \$200 apiece."

At the time there was no American built high-performance sailplane available and they thought the market was ready, Ernie designed the SGS 1-21. "We priced it on the basis of getting orders for ten ships, we finally got two." They decided to

go ahead anyway, thinking that when the soaring community saw the new 1-21, they would want to buy it. "They didn't, the orders didn't develop." Dick Comey flew the 1-21 (the same one that Peter Smith currently owns) to a national championship in 1947. Peter's father Stan Smith bought it in 1952 and finished second to Dick Johnson's RJ-5 in '53, then won the contest in '57, ten years later. "And today it's still a good flying sailplane," Bill said.

In 1949 SAC received an order to build the Bell 47 fuselage assemblies. TV viewers will remember it as the helicopter used in the MASH shows. "We built over 1,000 of these cabins." Schweizer Aircraft production lines were kept busy with subsidiary contracting, including GE pneumatic airborne detectors for anti-submarine aircraft, original tooling for some Piper aircraft and Grumman Gulfstream tail surfaces and ailerons.

With the glider business in a slump in 1954, Paul got the idea that there would be a market for sailplane kits. Following through with the idea, Ernie designed the 1-26, with kits for homebuilders. They were eventually sold for \$1,500, the completed ship for \$2,000. "We sold lots of them, but after the first run, people were more interested in completed ships." Kit sales decreased after the design was changed to make it less expensive factory-built. They produced 204 kits and 485 complete 1-26s. "This was our biggest seller."

In 1957 Grumman was looking for a broad-based commercial product and they designed

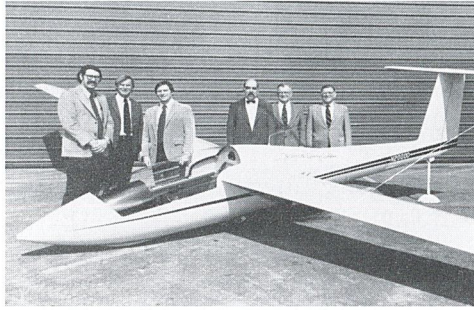
Schweizer Homecoming 2010

an agricultural aircraft they called the Ag Cat. The Grumman organization realized they could not economically and profitably market such a ship at their Bethpage Long Island facility. They chose instead to sub-contract the project. "We convinced them that Schweizer Aircraft was the one to build the Ag Cat for them." In the fall of 1957 Schweizer got an order to tool and build 100 Ag Cats. "We ended up building 2,646, at one point better than one a day. Grumman kept us alive with orders to build the Ag Cat."

The Ag Cat started out with a 220 hp engine and a half-ton capacity. It ended with 600 hp plus some turbines that were 750 hp and a two-ton capacity. In 1974 the industry built 1,200 airplanes, in 1983 it dropped to 116. "We were building 37, then it went down to 5 or 6 a year. At that point we sold the program."

In the meantime feedback from the Schweizer dealer organization that Paul was developing showed an interest in more performance and getting a third person onboard. Ernie dutifully came up with the ideal three-place, the SGS 2-32. He said that in 1964 the price was \$12,000 and by 1970 it had gone up to roughly \$20,000. "Today a 2-32 in good shape is worth between \$40,000 and \$50,000."

The next project was in 1967 when the 2-22 dealers wanted more performance and Ernie engineered the SGS 2-33. "We increased the wingspan from 43 to 51 feet. And along with other advancements the 2-33 became a real winner." By the end of the 60s they were selling



*Schweizer family with the
2,000th Schweizer Sailplane*

30 a year and that rate continued until 1978. Currently Les and Kyle (the next Schweizer generations) are supplying parts and service for the Canadian Air Cadet League. The US Air Force is considering getting back into Schweizers rather than the European fiberglass airplanes that don't wear as well.

They certified the SGS 1-34 with speed-limiting dive brakes in 1969 after several changes in the international rules the following year. Bill said, "But anyway the 1-34 was a good airplane and I believe we sold eighty-seven of this model."

Les came on board and worked with his dad designing the SGS 1-35. It was competitive with European fiberglass ships that were at that time heavier. Again the international rules changed making the 1-35 a 15 meter rather than a standard class ship. The Europeans started using carbon fiber and other exotic materials and the Schweizer Aircraft Company couldn't compete.

"Our last shot was the SGS 1-36 which we thought would be an update of the 1-26." Disappointing 1-36 sales after its 1980 introduction ended Schweizer sailplane production. Product liability, stricter FAA rules, more sophisticated production

techniques and European fiberglass competition were all factors.

During the Viet Nam War in 1969 Lockheed was looking for a super quiet airplane to replace the noisy helicopter. The helicopter-alerted enemy would then hide under the trees. (This was just before infra-red downward spotting was developed.) "They bought three of our SGS 2-32s and made quiet airplanes out of them." They worked so well that Lockheed ordered Schweizer to build the Lockheed YO-3A, ultra-quiet reconnaissance aircraft for use in Viet Nam.

When Schweizer suspended sailplane production they shifted into the successful helicopter business. Among several models that Schweizer developed was the 3-33, a turbine. That led to the Fire Scout, an unmanned helicopter. "It had become very successful and one of the things that Sikorsky is interested in."

"We merged with Sikorsky to build helicopters." The Schweizer Company had very large loans and the banks wanted the company's principals to sign personally for these loans. "That meant that if we made a mistake, we could lose everything." The result was that they started looking for a partner and a deal was arranged with Sikorsky to build helicopters.

Bill concluded saying, "As of last December (2009) exclusive of Black and Sea Hawk helicopters, Schweizer has produced 6,155 aircraft, 2,170 sailplanes, 2,646 Ag Cats, 88 special purpose airplanes and we have built 1,261 helicopters since then. So that's our story."



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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 self-addressed stamped envelope.
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