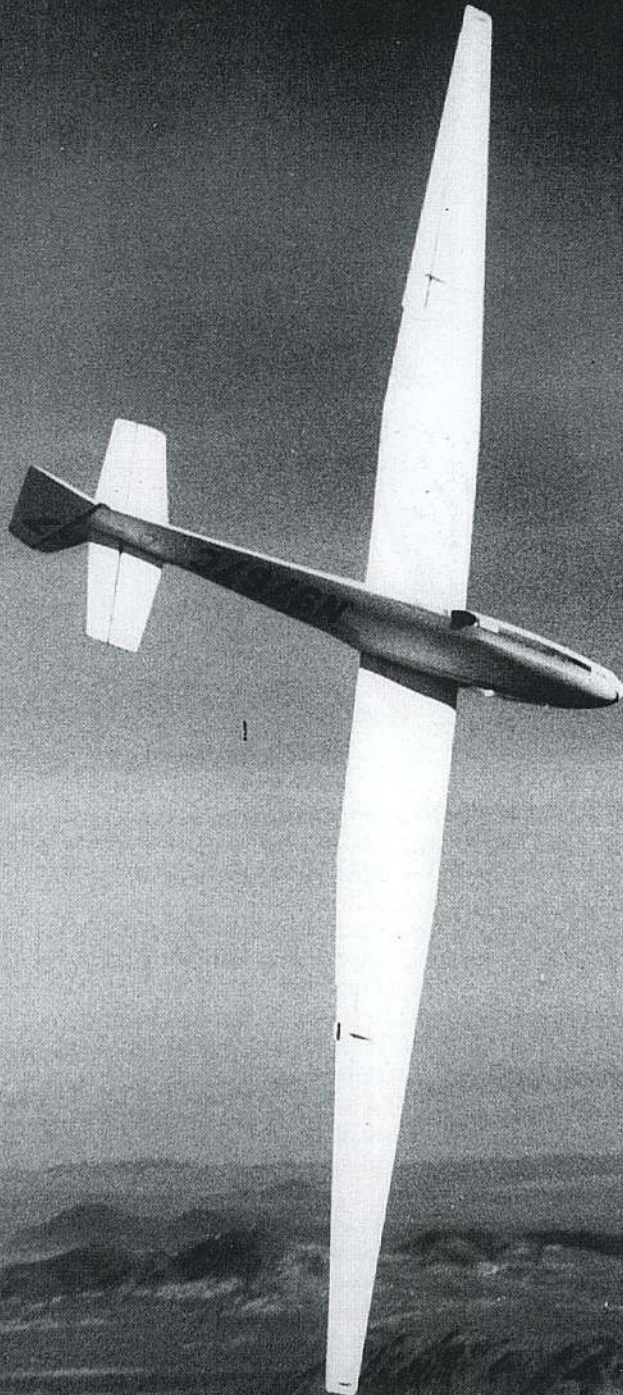


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Eddie Allen, and the first in a European

The Summer of 1922 American Glider Competition

1922 M.I.T. - The Tech Engineering News photo of the final version of the Allen-Koppen Glider. George Oglesby sketch of Eddie Allen at the controls of the first M.I.T. glider from "En Avant," September 1972 SOARING.

Mention the name Eddie Allen to any of the old-timers and recognition is an immediate, "Yeah, great test pilot. Tested some of the most famous ships of the '30's and '40's." What isn't as well known is that, in 1922, Eddie (Edmund T.) Allen flew a Massachusetts Institute of Technology-built glider against some of Europe's best, at national meets in Clermont-Ferrand in central France and at Germany's Wasserkuppe.

Allen was born in 1896 in Chicago, IL. By 1917 he had completed his first year at the University of Illinois. With the advent of World War I, he enlisted in the infantry, but later transferred to the aviation branch of the Signal Corps. Following his flight training he was sent to England to learn how the British tested their planes. Eddie Allen had found his calling. (1)

Following reassignment to McCook Field, OH, and with the end of the war, Allen resigned from the Army. He became the first test pilot for the infant National Advisory Committee for Aeronautics (NACA) at Langley Field, VA.

With his intense interest in aerodynamic theory and aircraft structures and design, Allen went to M.I.T. in 1920 for further study. There he joined the Institute's Aeronautical Engineering Society (AES), a student group that had first experimented with gliders in 1910. (2)

In Germany at this time, a spirited group of technical school students, ex-combat pilots and aeronautical engineers were experimenting with motorless flight in the Rhon Mountains. Glider flights of 13, 15, and 21 minutes were being logged on the 3,000 foot high Wasserkuppe. The French had announced an International Meet for the Summer of 1922.

Members of M.I.T.'s AES were impressed with information that they had received about the 1920 flights of Wolfgang Klemperer in his Aachen University "Schwartzte Teufel" and his 1921 ship "Blaue Maus." That year one of the Hanover Technical Group's students, A. Martens, flew the "Vampyr" 15 minutes, only to be beaten by a 21-minute duration flight by Harth in a flimsy "broomstick" glider.

The thrust of most American interest and investment at this time was in powered aircraft. The Atlantic had already been spanned in May, 1919 by Lt. Cdr. Read in the Curtiss NC-4 flying boat, hopscotching from Newfoundland, The Azores, Lisbon, El Ferrol and finally to his destination, Plymouth, England. One month later, Alcock and Brown flew nonstop from Newfoundland to Ireland in their WWI converted Vickers Vimy bomber. (3) Post-war aero-theorists envisioned covering whole continents with a global grid of airways.



Members of the Aeronautical Engineering Society at M.I.T. seemed to be as much interested in the aerodynamic challenges and problems of motorless flight as with those of powered aircraft. After all, wasn't it Orville Wright soaring over the dunes of Kitty Hawk in 1911 that set a 9-minute, 45-second record that stood for 10 years? And technical universities were very much involved in the development of soaring in Europe, especially in Germany.

The AES sponsored a glider design contest that attracted seven entrants. (4) Eddie Allen and Otto Koppen submitted the winning design competition and the prize of having their design constructed. A sum of \$200 was raised by the group and members were asked to donate a total of 100 hours each week to build the Allen-Koppen glider.

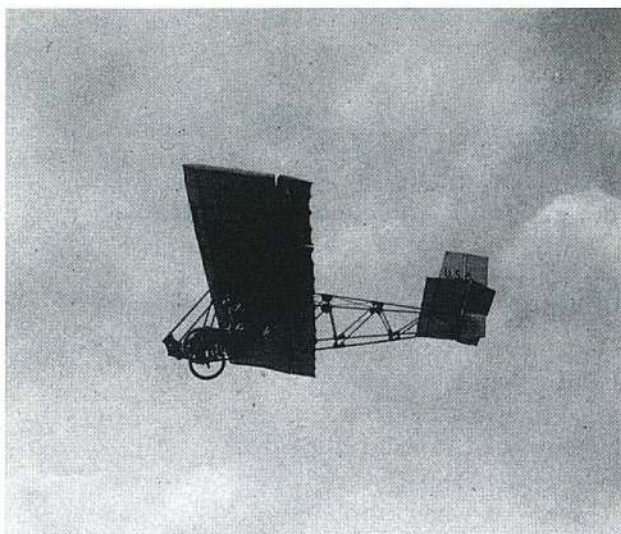
When the ship was completed it was taken to Hog Island (off Rockport, MA). (5) This site was chosen because it was without trees, was over 200 feet high and was reported to have a constant ocean breeze. On a rainy Sunday, MIT students Eddie Allen, H.C. Karcher and O.C. Koppen (6) made five unsuccessful attempts to get the newly constructed machine off the ground. Originally, the tiny monoplane was fitted with skids for landing. In towing over the stones of the Hog Island launch site, both skids were broken.

After makeshift repairs in a Rockport barn, the "Kiwi," as Allen called it, was ready for its next Hog Island outing. The first flight lasted a half minute and reached a 10 foot altitude. But it was enough to ensure its stability, even though the rudder control was insufficient at low speed. The skid arrangement broke after almost every subsequent landing and convinced the builders that a heavier undercarriage was needed. (7)

In spite of rocks, rain, broken skids, an undersized rudder and fanciful flight characteristics, back at MIT the trials were extolled as the first successful glider efforts made in America since those of Orville Wright in his 1911 version.

AES advisor, Professor Edward P. Warner, urged the group

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The original M.I.T. Allen-Koppen Kiwi glider
(NSM Archives)

Continued from Page 2

to accept a French invitation to enter the AES glider in the "Premier Congres Experimental d'Aviation Sans Moteur," to be held at Clermont-Ferrand, France, August 6-20, 1922.

With Allen as point-man, frenzied preparations, or more accurately, rebuilding- began. Same-size wings were redesigned to give a more efficient profile. Flaps were devised to increase the lift co-efficient when taking off, landing and in gusts. This increased the size of the ailerons (the roll axis control) to the full length of the semi-span. The "joystick" (control column) was rearranged to allow the flaps to be used as ailerons.

Designs for a spare fuselage "to reduce resistance and increase the gliding angle of the whole machine," (Allen's words) were drawn up one Sunday in the MIT's tunnel building. Construction began the next day. The pilot was to be seated with his head through the center of the wing. The rudder and fin area were doubled to provide better yaw control (the directional axis).

Still picking landing skid splinters out of their britches, the group fitted the new ship with wheels.

Finding the money for transport to France and logistics proved extremely difficult. With characteristic enthusiasm, Allen said, "I decided to take the responsibility for making the entry, trusting that the funds would be forthcoming when they were needed." (8)

The American team boarded LA SAVOIE for France.

"Mon Dieu, mes amis!" was the reaction of French Customs. Never noted for their flexibility, the French bureaucrats could not determine the classification of the crated arrival. Not an airplane, not a kite....what? With help from the embassy in Paris, the matter was clarified. Allen led the glidermen to the meet site at Combegrasse, some 22 kilometers from Clermont-Ferrand in the hills of Auvergne, central France.

The 25 entrants ran the spectrum of motorless adventure. There were Farman, Potez and Clement, French sport planes with their engines removed and cleverly modified into gliders. Allen commented that the design of power planes had reached such levels of efficiency that a good sport plane without an engine could out-perform the average glider as it was then being built.

Other types included ships especially designed for soaring, the best of which, according to Allen, was the Dewoitine and the Coupet. These two gliders illustrated the fundamental difference in the French and German approaches to soaring. The French expected to secure soaring flight by building for lightness and high lift. German experimentation showed that far more efficient soaring could be gained by having a low sinking speed, which means a high gliding angle, and high speed with heavy wing load-

ing. (8)

Other classifications included hang gliders and a group of whimsical winged devices created by builders to whom aerodynamics was an abstraction. "Freaks," in Allen's words. He said, "When one considers the amount of human effort, to say nothing of the expense that went into the construction of these machines, the freak exhibition becomes tragic rather than humorous."

After passing the elimination requirement flight of ten seconds, the reworked American machine "handled as nicely in the air as any scout," Allen said.

The contest started August 7, and Allen's third flight was enthusiastically reported in the Paris EXCELSIOR. "During the third trial, which was the most beautiful, he gained height and maintained himself at the level of the spectators placed at the summit. He rose, went forward, then flew as if fastened to the flank of the mountain." (9)

By Aug. 11 the Americans had the lead with three flights and a total time in the air of 12 minutes and 27 seconds.

Francis Chardon, a Swiss athlete, in a single surface Pelznert-type biplane hang glider, was second, with a total time of 11 minutes, 47 seconds. Next came the great French Trans-Africa pilot and sartorial dandy, Lucien Bossoutrot, with 10 minutes and 20 seconds total time.

M. Sardier, a French cycle champion followed in a Clement triplane with a total of 3 minutes and 2 seconds. Of the Clement, Allen said, "The little triplane was so heavy and inefficient that no soaring was possible in it." It had to be launched with a special rubber Sandow cord that worked like a powerful slingshot. This device, borrowed from the 1921 German meet, was also used by the American team.

By the fourth launch Allen said, "the assistants could not pull the (Allen-Koppen "Kiwi") machine fast enough on the ground to lift it into the air." It ground-looped, skidded sideways down the mountain and smashed against some rocks, wrecked beyond repair. Miraculously, Allen was unhurt. The Yanks went to work assembling a new glider with what they could salvage from the wreck and the spare wings and fuselage that they carried with them.

They were back in the meet three days later.

And so was their bad luck. The rebuilt second American glider was extensively damaged after hitting a rock on launching. By the time repairs were completed the meet was almost over.

Allen said that the meet was one of attrition. The machine that had spent the least time in the hangar under repair would win.

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Left to right: Dr Wolfgang Klemperer, L.F. Ross, Eddie Allen, Jack O'Meara, Albert Hastings and Donald Walker, Mgr., National Glider Association. (Fred Loomis Collection - NSM Archives)



George Oglesby sketches of some of the gliders participating in the 1922 French Meet.

Continued from Page 3

Landing gears seemed most vulnerable. Most of the contestants spent most of their time in the hangar restoring their mounts to airworthiness, at least to launch-worthiness.

Allen noted that even when conditions were most favorable, the longest flight that had been made was one-fourth of the time of Orville Wright's 1911 biplane glider over the dunes of Kitty Hawk, and one-tenth of the time made by the Germans the previous year. Even the most promising theories of soaring flight seemed not to have been valid on practical application. (10)

The Americans made the longest "pallier," (without losing altitude) flight. But as Allen explained, "pallier," and not time in the air is the true test of soaring flight. A long time in the air may be attained by simply gliding down from higher mountains or piling up numbers of insignificant short glides, procedures that have no scientific interest whatever. "Pallier," on the other hand, is the maintenance of continuous horizontal flight and is the great objective of research.



At this point the jury decided that Allen must declare which of the two American glider flights was to count. The judges evaluated the repaired M.I.T. club ship. The ship was so different from the original state that its former records were disallowed. By now, most of the times set by the wrecked first American machine had been surpassed, and only four days remained to establish new records.

Short stability test hops showed the new glider to have a higher flying speed but a lower rate of descent than the original machine.

With only one more day left in the meet, the Americans withdrew. The team felt that to continue would discard the records set by the old ship. Then, there was always the specter of another crack-up. The team was looking forward to matching their glider against the best, at the German meet on the famous Wasserkuppe. They didn't need more repairs to impede them. As if the club members needed another reason, there also was the possibility of delays in shipping the new American ship to the Wasserkuppe.

On the afternoon of the 19th, Bossoutrot in the Farman "Moustique," made the one outstanding flight of the meet, five minutes and ten seconds. Allen wrote that this flight "was the only one that showed the possibility of utilizing the energy of the wind for remaining in the air any extended time."

Bossoutrot won the meet, taking first place in every event. His total time "in the air" flying for the two weeks was forty-nine minutes and fifty-nine seconds.

In his report to the Massachusetts Institute of Technology Aeronautical Engineering Society, Allen concluded that if such contests were to have any real scientific or even sporting value, means must be determined whereby emphasis is placed upon the real accom-



plishment. Terrain should be carefully selected in order to give contestants the largest area of rising air currents and clear landing sites. Speedy repair facilities and plentiful retrieval facilities for taking a glider up the hill must be provided.

Eddie Allen at the French Clermont - Ferrand Meet is shown in a segment of the "History of Gliding" video presentation in the NSM's main exhibit hall.

Finally, Allen stressed, efforts of present and future competitors should place the emphasis on flight above the horizontal rather than upon total time in the air.

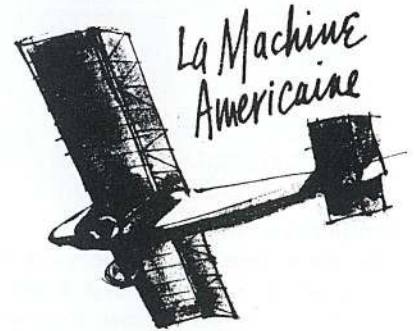
The Allen-Koppen M.I.T. was a high-wing, cantilever monoplane glider and represented the only U.S. involvement in international soaring in the 1920's.

Wingspan - 30 feet
Aspect Ratio - 6.5 to 1

Empty Weight -
73 pounds

Glide Ratio -
9 to 1 (estimate)

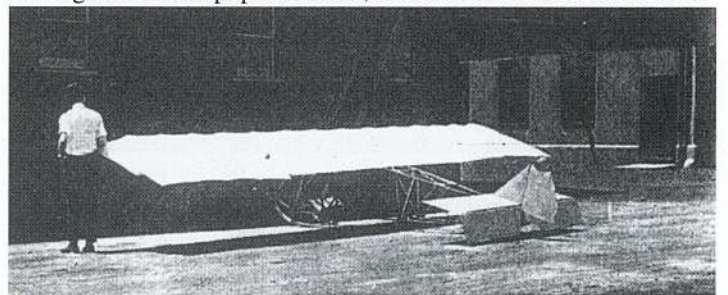
Stall Speed - 23 miles per hour (estimate)



THE AFTERMATH

There was little unanimity in the reactions of the scientific world and air-minded sportsmen to the results of the French meet and to the outstanding gliding performances on the German Wasserkuppe.

At the close of the meet Allen sent a dispatch to the Chicago Tribune in which he commented on the soaring exploits of the German pilots, Martens and Hentzen, on the Wasserkuppe. "News of a two-hour flight by a German glider caused much interest among the French populace here, but it is not fair to make a com-



"The first plane was overtaken by misfortune early in the contest, but its three operators show everyone their real 'Tech Spirit' by having another machine built in two weeks." - M.I.T. The Tech Engineering News, 11/22. (Cornell University Engineering Library)

parison between the meets. The Wasserkuppe is three times higher than Combe-grasse, (the area from which French contestants flew) and much better for rising air currents." (11)

By the time the AES group from the States arrived at the Wasserkuppe, the meet was almost over. Martens, in the Vampyr, had upped the duration mark to 3 hours and 10 minutes. Paul A. Schweizer said in his book, WINGS LIKE EAGLES, "The German designers were making good progress in improving performance by using new airfoil shapes, high aspect ratio (slender) wings, and smoother wing contours, which they achieved by covering the leading edges with plywood." (12)

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In a test flight of the AES glider after the meet, Allen, who hadn't done much flying since his arrival, was caught in gusty wind conditions. He lost control of the little ship and cracked up. The NEW YORK TIMES reported that Allen had "suffered a serious accident and was taken to the nearest hospital in Gersfeld. This was the first serious accident to mar the trials at the Wasserkuppe meeting." (13)

From his Wasserkuppe experience, Allen concluded that future gliders should be constructed like the successful German designs, better control rather than lighter weight. (14)

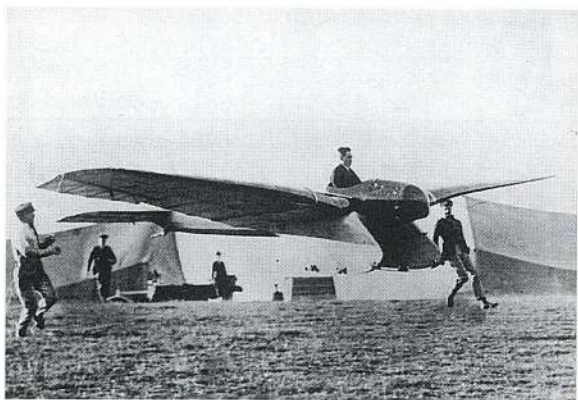
The great French pioneers of flight Gabriel Voisin and Louis Bleriot commenting on the French meet, agreed that motorless flight had no future. They held that the best results of the Clermont-Ferrand meet hardly equalled those of the earliest pioneers, like Lilienthal, Chanute, Pilcher, and the Wright Brothers.

The most favorable hypothesis Bleriot, conqueror of the English Channel in 1909, would accept was "that motorless flying would become a popular sport like tobogganing and will be carried out under certain limited atmospheric and topographical conditions in certain districts, such as Rhon in Germany." (15)

On the other hand, German Professor Brial of the Hanover Technical High School, said that the flights of Martens in the Vampyr and Hentzen in the Greif proved conclusively that sailing through the air without motors was possible if the atmospheric conditions permitted it. (16)

The German success even gave rise to speculation on the possibility of trans-oceanic glider flights. Captain Keller, who was in charge of aerial service at Staaken, and Professor Wengener, a prominent flying expert, advanced the theory that an airplane of this type could fly to New York closely trailing an ocean liner, utilizing, as gulls do, the up-going currents above the troughs left by the steamships. They explained that the vertical draughts figure most prominently in the success of the new style of flying. (17) [This method was tried unsuccessfully eight years later. See *Spring 1991, NSM Journal, Volume 13 Number 3*; "Across the Atlantic by Glider!"]

MIT's Professor Warner, on his return from Europe in Sep-



J. Jeyes, in a Klemperer-type Blaue-Maus at the Royal Aero Club Meet at Itford Hill, 1922. (NSM Archives)

tember, had a somewhat pessimistic outlook on the future of gliding, saying, "Despite the fanciful articles on air sailing, there is absolutely no outlook for motorless flight as a means of transportation." A keen observer of world-wide aviation developments, Professor Warner summed up his observations of commercial aviation in the countries that he and the American gliding team visited. He said, "Every civilized government in the world that was not bankrupt, with the exception of the United States, was finding it worthwhile to develop aviation. Subsidies were granted by nearly every country..." (18)

Later, a still bruised Allen attended the English meet at Itford in the South Downs Region, as an observer. The meet sponsored by the Royal Aero Club and the DAILY MAIL newspaper drew nine gliders, only six of which had flown previously. The winner, Manyrolle of France set a world duration record of 3 hours and 20 minutes in a tandem winged machine reminiscent of S.P. Langley's 1903 Aerodrome. While the contest was well publicized and attended, the British soaring movement languished until 1930. (19)

Eddie Allen went on to become one of the most famous test pilots of the '30's and '40's. He piloted more than 80 different airplanes on their maiden flights during his career, and his exploits became air-lore.



**Edmund Turney
"Eddie" Allen
Chief of Flight Test
and Aerodynamics Research at Boeing Aircraft Co. at the controls of a Boeing B-17 Flying Fortress.
(National Air & Space Museum photo)**

On February 18, 1943, Allen took off in the second prototype XB-29 (the three bladed prop version) for engine tests. Twenty minutes later after take-off he notified Boeing Field that he was coming in with a wing on fire. Moments later, the plane hit the adjacent Frye Packing Plant, killing Allen and ten Boeing Super-Fortress specialists. (20)

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1. Boeing, Plane Maker To The World, by Robert Redding and Bill Yenne, page 103
2. Wings Like Eagles, by Paul A. Schweizer, page 9
3. Aviation: The Pioneer Years, by Ben Mackworth-Pread, page 221
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5. En Avant! Eddie Allen and the American Machine at Clermont-Ferrand in 1922, excerpts from Eddie Allen's report to the MIT, with drawings by George Oglesby, *SOARING* magazine, May 1975
6. New York Times, July 14, 1922, page 14
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11. New York Times, August 22, 1922, page 19
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Report on a trip to the Restoration Facilities of the Berlin Museum for Technology & Commerce

April 1, 1995

by Jan Scott

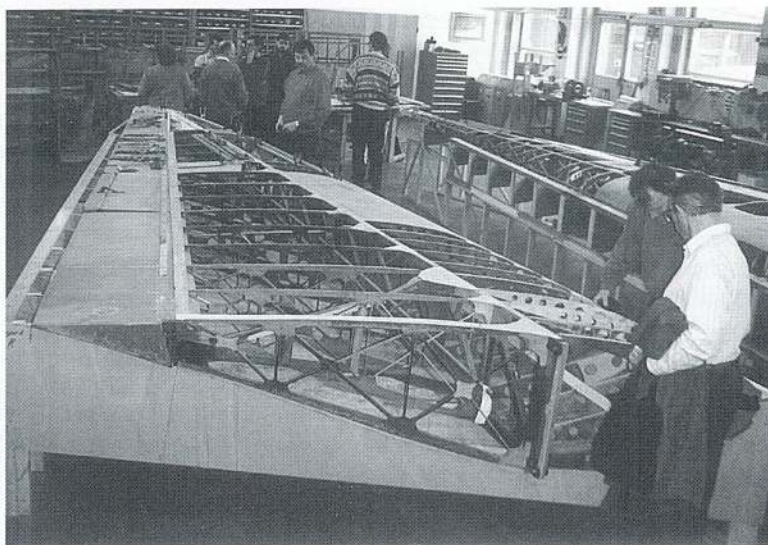
Trustee & Past President of the NSM

The Museum für Verkehr und Technik was one of Germany's largest museums before it was destroyed by Allied bombing raids in 1944. Among its many rare aircraft was the famous 12-engine flying boat Dornier X, which toured the United States in 1931. Its remains can still be seen in the museum ruins. Only a third of the building has been rebuilt.

The smaller aircraft that could be moved, were crated and evacuated to German controlled Krakow, Poland, before the bombing raids started. These aircraft survived the war, and some of them are now offered for sale or trade by the Polish government.

The aviation department of the Berlin Museum, under the direction of Dr. Holger Steinle, has embarked upon an aggressive program to have significant aircraft returned to the museum collection from countries like Poland and the United States, which confiscated large numbers of German aircraft after WWII. As part of this effort, an agreement was entered into with the National Air & Space Museum in Washington DC to return four flying wing gliders to Berlin for restoration. The initial arrangement was that Berlin would keep one, and the other three would be returned to Washington after they were restored.

The four gliders were among 10 models designed by Dr. Reimar Horten between 1935 and 1943. The design concept was a pure flying wing without any vertical surfaces, based on the 1910 "Junkers Patent."



The Horten II L in the Museum for Technology and Commerce workshop Berlin, Germany, April, 1995. (Jan Scott photo)

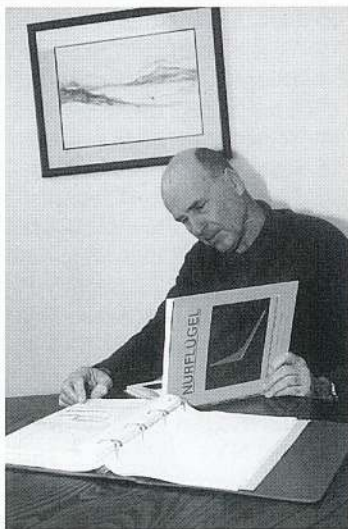
The appearance of the Horten sailplanes is that of the swept-back wing of a modern jetliner flying all by itself. A month after a photo of the Horten II glider appeared on the front page of the NEW YORK TIMES in 1937, Northrop received a US Government contract to develop a similar flying wing. Northrop built several models, from small single-seaters to large multi-engine bombers. While their appearance was very similar to the Horten designs, they lacked Horten's aerodynamic qualities. These, which included the "bell shaped lift distribution curve" made the gliders stall- and spin-proof, and eliminated adverse yaw. The technology remained a secret until Dr. Horten published a book on his work and theories in 1983. (Horten / Selinger "Nurflügel").

The four gliders were shipped to Germany about two years ago. They had been stored outside and exposed to all kinds of weather for about 20 years after Northrop engineers finished studying them in 1946. The one that was least damaged, an Ho II L and the second of four built, went into restoration first. As the wings had been stored on their leading edges, all the rib noses and the entire outer wing section with the drag rudders had to be rebuilt along with sections of the spar and trailing edges. During the repair, the wings are supported upside down on specially built jigs,

Continued on Page 7

The Horten Flying Wings and Jan Scott

Readers have shown considerable interest in Horten flying wings following publication in the NSM HISTORICAL JOURNAL (Vol. 16, No. 2, 1995) of articles on Rudy Opitz' 1952 flights in the Horten IV. The accompanying article is a first hand report by Jan Scott on Horten flying wing restorations at the Berlin Museum for Technology and Commerce.



(NSM Staff photo)

Jan Scott interviewed and translated several meetings with the late Dr. Reimar Horten for *SOARING* Magazine (1). Dr. Horten and his brother, Walter, designed the Horten series. Scott began flying in 1948 in an SG-38 primary glider, and later served with the Norwegian Air Force. He holds license #2, the second issued in that country, and was chief glider instructor for the Norwegian Aero Club.

A retired American Airlines Airbus A-300 pilot, Scott has had experience in many aspects of airline operations, "from baggage handling to upper level management," he said.

He is a past president of the National Soaring Museum and of the Vintage Sailplane Association. He is also a member of the International Advisory Committee for Vintage Sailplanes, and has a collection of vintage gliders. Scott is the sole remaining founding member of the Vintage Sailplane Association. He has been instructing flight for 43 years, and along with his wife, Astri Mai, owns and operates the Scott Air Park in Lovettsville, VA.

(1) Flying Wing Position and Design Options by Dr. Reimar Horten, translation by Jan Scott, *SOARING*, Aug. 1980, pgs. 22-25 Lift Distribution and Flying Wing Aircraft by Dr. Reimar Horten, translation by Jan Scott, *SOARING*, June 1981, pgs. 40-42.



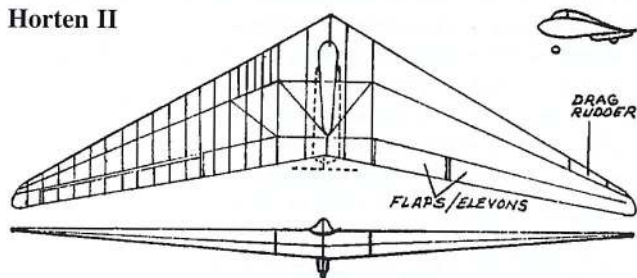
Dr. Edward Uden (center) in the Berlin Museum for Technology and Commerce Workshop. (Jan Scott photo)

with proper airfoil contour support for every rib. The steel tube center section was stripped, repaired, rust proofed and attached to one wing. The woodwork was adequate for display purposes but far below the quality standards produced by the experts at the Paul Garber facility at Silver Hill, Md. The repair work is being carried out by a team of Polish craftsmen under the direction of a Mr. Hundertmark. Since limited resources are available, there is an understandable reluctance to use 30 DM/hour labor to do extensive and time-consuming fitting and sanding where it is not necessary. A lot of splicing and patching was done to preserve as much of the original material as possible. An interesting discovery was the hinges for "clamshell" drag rudders that had once been installed on this aircraft.

Money for the repair work had been obtained from the State Lottery, which is obliged to make 20 % of its income available for "cultural projects" like this.

The restoration work is not carried out at the museum but in a workshop across town in the Reinickendorf section of Berlin. The shop is part of the former Argus aircraft engine factory, which some-

Horten II



how survived the war. I was invited to attend the first public showing of the gliders since the restoration began, and before the work was covered up by the plywood and fabric skin. The covering was scheduled to be completed in May.

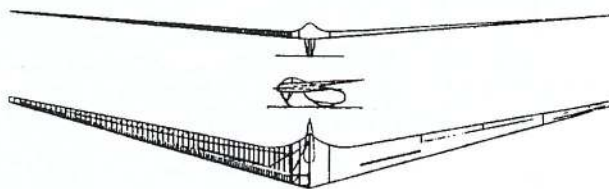
The gathering was hosted by Dr. Edward Uden who has obtained the rights and possession to the works and artifacts of the late Reimar Horten. Dr. Uden has produced high quality blueprints and precise calculations from available material, using advanced computer technologies. The drawings will be of great help in restoring the two Ho III's and the VI. They also will make the building of a planned replica of an Ho IV possible. During the gathering, lectures and videos were presented.

The event attracted several model builders who brought their flying wing models with them. Dr. Uden is himself an active model builder and uses flying models to test the Horten concepts. One of his models, a nearly finished flying scale model of the Ho IX twin

jet, complete with working ducted fan electric engines, is the most impressive example of modeling workmanship I have ever seen! Dr. Uden has a miniature machine shop connected to his computer, and builds models the way Boeing builds commercial jetliners. The two electric fan engines, built entirely of wood except for the motor, looked much like the original Jumo 004 engine.

The Ho II restoration was expected to be completed early in the summer of 1995. Next wing jigs for the two Ho III's will be built. It appears that the four wings needed will have to be built

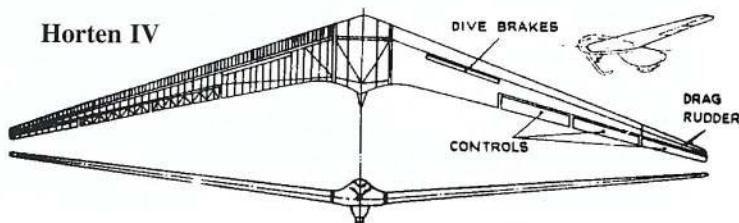
Horten VI



from scratch, as only the metal parts have survived, and two wings are missing.

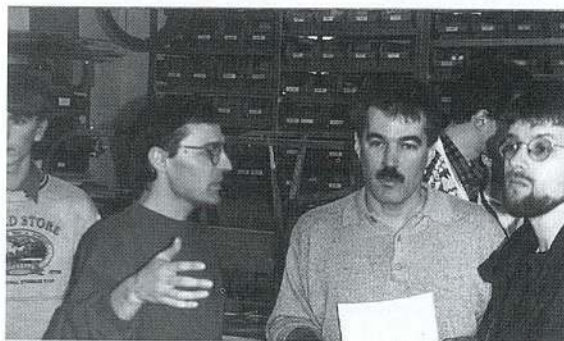
The Ho VI is complete and in relatively good shape. Its center section with the cockpit has already been put on display at the mu-

Horten IV



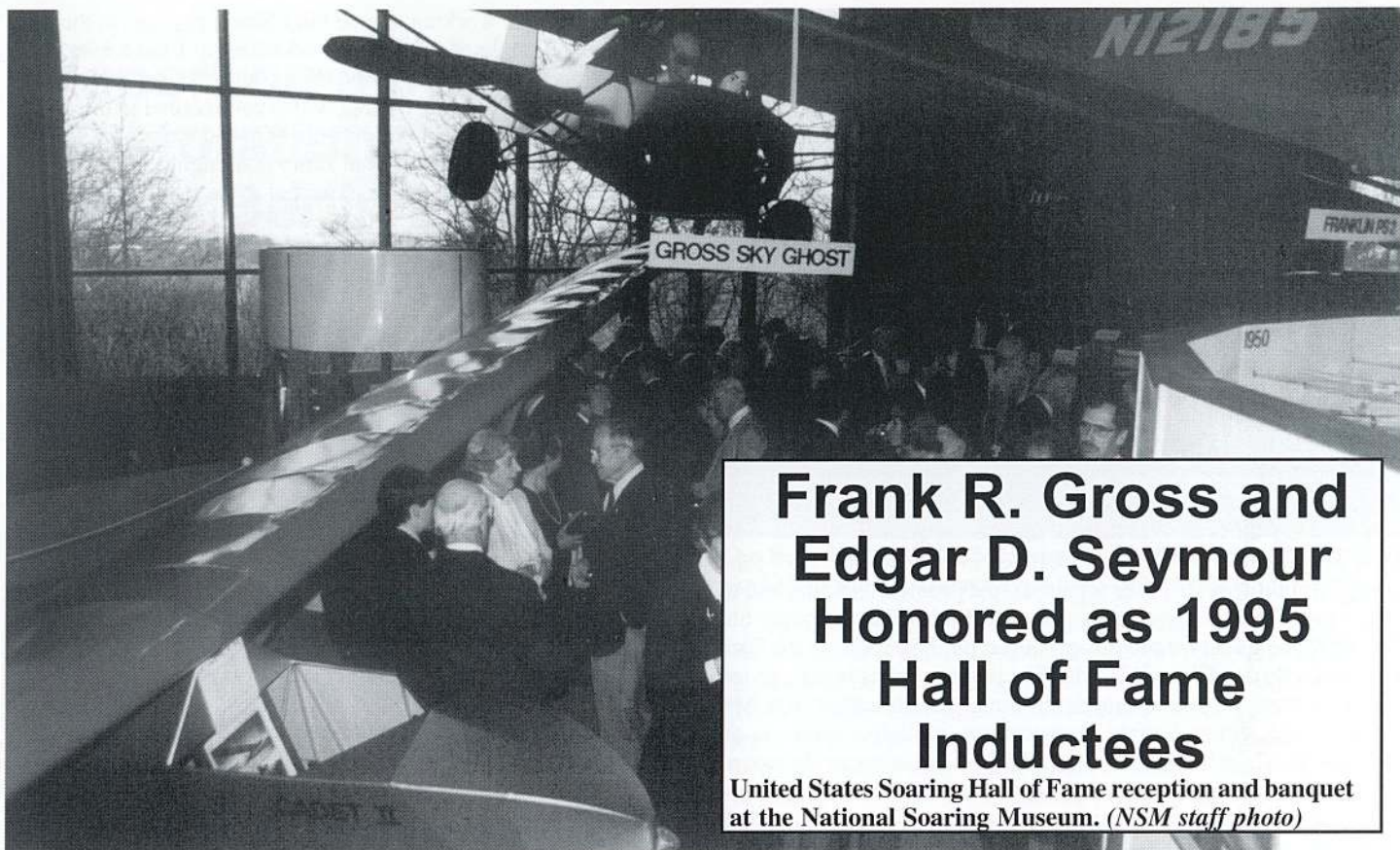
seum. Since the VI was the last type produced, it will also be restored last.

There were other significant soaring events taking place during my four days in Germany. On Friday, the 18 meter span Ventus 2c, was flown for the first time at Hahnweide. On Saturday, the Horten presentation. On Sunday Mr. Klaus Heyn allowed several of us to see and photograph the Musterle replica that has been "secretly" built in his home near Stuttgart. This is the type that Wolf Hirth flew from a park next to River Drive in New York City in March of 1931. The wings have yet to be built. There are some problems finding the proper material for the spar caps of the three piece wing, and also problems convincing the German Air Ministry that it should be allowed to fly in its original configuration.



Project leader Hundertmark (l) and Berlin Museum for Technology and Commerce Director Steinle (r). (Jan Scott photo)

And finally on Monday, the successful first flight of the new ASW-27, the news conveyed by telephone from an ecstatic Gerhard Waibel. A tour of the Schempp-Hirth plant in Kirchheim, and a couple of evenings socializing with old friends completed my very enjoyable short visit to Germany.



Frank R. Gross and Edgar D. Seymour Honored as 1995 Hall of Fame Inductees

United States Soaring Hall of Fame reception and banquet at the National Soaring Museum. (NSM staff photo)

The National Soaring Museum hosted the 42nd Annual United States Soaring Hall of Fame induction ceremonies May 3, 1996, for Dr. Frank R. Gross, Akron, OH, and Edgar D. Seymour, Rochester, NY. They joined 95 others who have gained national recognition for their noteworthy contributions to the advancement of the science, art and sport of soaring flight.

The Soaring Hall of Fame received its start through an athletic foundation, established in 1936 by Paul Helms, Sr., of Helms Bakery in Los Angeles, CA. In 1954, the Foundation decided that soaring was a sport of such national and international stature as to rate a Soaring Hall of Fame. Accordingly, the Directors of the Soaring Society of America were asked to recommend candidates for recognition. In 1975 the SSA Directors transferred the Hall of Fame to the National Soaring Museum.

SSA President E. Gene Hammond first called on airline and soaring pilot Bernard Gross, son of Dr. Frank Gross, to introduce the Wasserkuppe veteran and octogenarian pioneer. The elder Gross said, "For me, the history of gliding goes back 70 years when I was a member of the Academic flying group in Darmstadt, Germany, which was and still is, a leader in developing gliders."

Then he delighted the audience with a slide presentation that took them back to the wellspring of gliding in the 1920s. The first was a photo of a flimsy looking biplane glider with Gross, three others and flight instructor, Bubi Nehring. "Note the absence of modern gadgets. You flew by the seat of your pants in those days," the new Hall of Famer chuckled.

The next slide was of the Darmstadt I sailplane, taken on the German Wasserkuppe in 1922. Pilot Nehring was shown with designer, Hans Voelker. Gross designed the famous ship's fuselage and tail surfaces for Voelker. The American Motorless Aviation Corporation, funded by J. C. Penney, Jr., son of the founder, brought the Darmstadt I, along with instructors Peter Hasselbach and Paul Lubenthal, to the United States. A gliding school was started on the dunes of Cape Cod, MA. While Hasselbach and Lubenthal returned to Germany, the ship stayed in this country.

With a landing gear added and fuselage modifications, it was re-named, "Chanute." Around 1930 the Darmstadt/Chanute made news internationally in a memorable flight over New York City by Jack O'Meara (Hall of Fame, 1956).

Frank Gross came to the United States in 1929. At the invitation of Dr. Wolfgang Klemperer (Hall of Fame 1954) of the Goodyear-Zeppelin Corporation, Gross moved to Akron, OH. Klemperer introduced Gross to Jack Sperry, a former WWI, A.E.F. fighter pilot, then president of the Baker-McMillen Company. At Sperry's suggestion, the young newcomer began building gliders in an abandoned woodshed at the rear of the Baker-McMillen Plant.

In a surprisingly short time, Gross turned out a number of successful designs: "The Baker-McMillen Cadet I Primary," "The Cadet II Utility Glider," and the sleek, high performance "Akron Condor." The latter was actually designed by Gross in Schussenried, Germany, but built in Akron.

The speaker smiled as he recalled, "Today I shudder to think of what I had bitten off." All the dimensions in the Gross drawings had to be changed from metric decimal to inches, feet and yards. Some of the measurements came out in the 16th, 32nd and 64th inches! "Then," he said, "I found myself setting up operations to build a high-performance sailplane with no experienced help in the shop or in the office."

Gross showed slides of Klemperer making the first long distance flight in the "Akron Condor" at Uniontown, PA.

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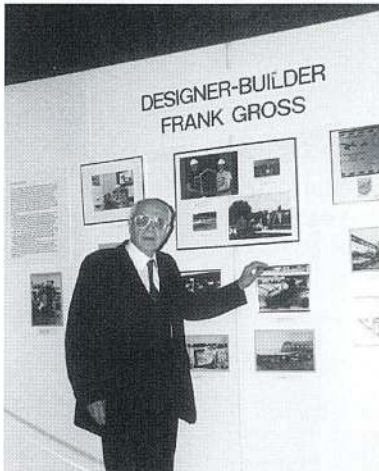


Frank Gross (left) with NSM Director James W. Swinnich. (NSM Staff photo)

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Another showed Jack O'Meara after his two-hour flight in the "Condor," shaking hands with William Hawley Bowlus in 1930 at Elmira, NY.

He followed with a group of historic pictures, including one of the Goodrich Girls Glider Club in 1930, which he said was "probably the first such women's organization in the world." A dramatic slide showed the Goodyear blimp, "Defender" towing four gliders: three



1995 inductee Frank Gross describes some of his designs during the Hall of Fame reception. (NSM staff photo)

Baker-McMillen Cadet IIs and the Gross Sky Ghost.

Gross went to Germany in 1930, married Herta Camerer in Stuttgart and earned his doctorate (his thesis: "Contributions to the Development of Towed Flight").

After returning to the United States in 1931, he built the two-place Sky Ghost. This ship was flown in the 1931 and '32 Elmira contests with the Funk Brothers, Howard and Joe, along with Pratt Jones as pilot and Gross as copilot. Later he started the Gross Glider Taxi Service at a dollar a flight.

Working full time as a draftsman in 1934 at Akron's B. F. Goodrich Company, Gross still found time to design a four-place glider. He hoped that the four-place would have more commercial potential than the two-place Sky Ghost. It took the same manpower to operate and carried three times as many passengers. The Gross Four-Place Glider was featured in a 1934 POPULAR SCIENCE Magazine article.

The donnish Hall of Famer told of an incident advertised by the Akron Junior Chamber of Commerce as "The First Airplane-Towed Glider Flight — Akron to Columbus, OH, Carrying U.S. Mail in the Only Four-Passenger Glider in the World, June 29, 1935". (See *NSM QUARTERLY JOURNAL*, Summer 1985; Vol. 8, No. 1). Bill Bodenlos, a Goodyear Zeppelin Corporation fore-

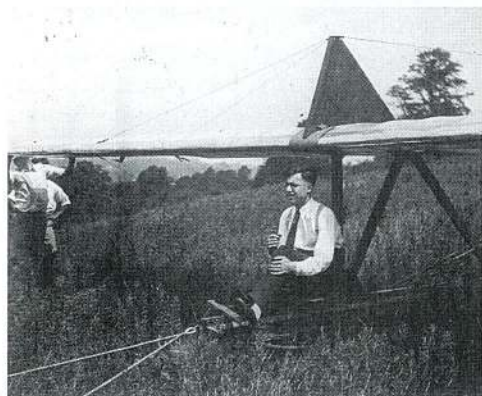


U.S. Soaring Hall of Fame members welcome 1995 inductees. L. to r., seated: Paul A. Schweizer, 1955, Elmira, NY; Virginia M. Schweizer, 1971, Elmira, NY; 1995 inductees Dr. Frank R. Gross, Akron, OH; Edgar D. Seymour, Rochester, NY; Standing, William Schweizer, 1984, Elmira, NY; Bernald S. Smith, 1984, Fremont, CA; Karl H. Striedieck, 1980, Port Matilda, PA and Floyd J. Sweet, 1963, McLean, VA. (NSM staff photo)

and almost ran into the Goodyear-Zeppelin dock. Then, the towline trailed through the woods just beyond. Clearing these earthen protrusions, the air speed started to build alarmingly...60, 70, even bumping 80 miles an hour. The design tow speed was around 35 mph. The pre-arranged signal to slow down had been for Bodenlos to wiggle the glider's wings. When he tried it, the ship nearly rolled on its side. Next, there was a startling, "Whooooosh," and the transparent windshield, serving as the cockpit roof, blew off. Added to that, there were loud cracking noises emanating from the glider's tail section. Still the doughty pioneers hung on, and without further incident, landed an hour and half later in Columbus.

Four homing pigeons flapped their way back to Akron from

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A 1930 photo of Frank Gross ready for a primary glider bungee launch at Akron, OH. Caption reads: "Gross was one of the designers of the famous Darmstadt glider which established a number of records in Germany." (Gross photo)

man, was the glider's pilot and Willis Sperry the copilot. Bodenlos discovered after the combination was airborne, that pre-flight planning hadn't allowed for the mismatched low glider speed and the high towplane speed.

On take-off, the towplane couldn't build up enough altitude



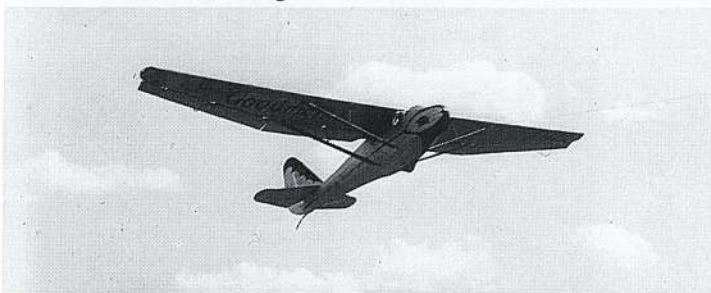
The Gross Akron Condor, probably during the Uniontown Expedition with Wolfgang Klemperer in the cockpit. (NSM archives)

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Columbus with the news: "Arrived okay, Greeted by Postmaster McCoy, Ohio Attorney General Bricker, and a large delegation. Almost lost the glider in flight."

After the Four-Place glider arrived back in Akron by trailer, Gross discovered that the guy wires between the struts had stretched due to the extreme high flying loads and excessive drag. "It's a wonder that the ship didn't break up in mid-air," he said. However, a week later, the tough, trailblazing Gross Four-Place was repaired in time for the trip to the National Glider Contest at Elmira, NY.

On June 29, 1985 the historic Akron/Columbus glider flight was reenacted, following the dedication of the National Land-



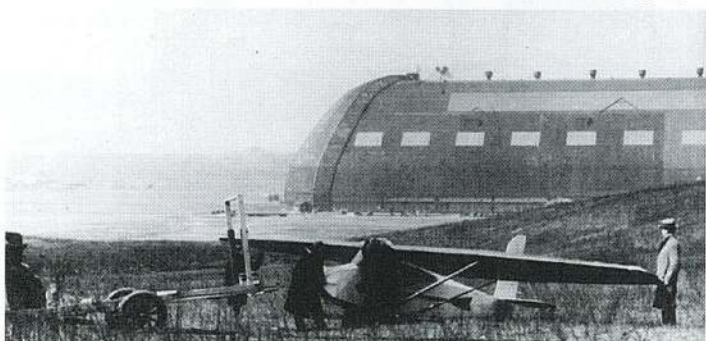
The Gross Four-Place glider on take-off. Photo believed to have been taken at Purdue University in 1935 or 1936. (Gross photo)

mark of Soaring plaque honoring the people of Akron for their 50 years of interest and support of motorless flight. To mark the event, son Bernard Gross piloted a modern two-place Grob Acro sailplane, with his father as copilot and 2,500 especially postmarked anniversary cachets.



Goodrich Girls Glider Club with their Baker-McMillen Cadet, Akron, OH, 1930. Probably the first woman's glider club in the world, according to Dr. Gross. (Gross photo)

The speaker showed a slide of the Schweizer TG-3 training glider built by Air Gliders, Inc., during WWII, under license. The ship was first flown in April 1943 with Emil Lehecka as test pilot, and Gross, Air Gliders' chief engineer, as copilot. Only one glider was finished and accepted by the military before the order was cancelled. The Air Force, at much less cost, modified existing light



The Baker-McMillen Cadet II utility and training glider, 1929, in front of the Airship hangar in Akron, OH. (Gross photo)



The Gross family, left to right: Mark Gross, Elie Gross Bullis, Gay Gross, Dr. Frank Gross, Gloria Gross, Bernard Gross, Dottie Gross, Peter Gross, (kneeling) Christopher Gross. (NSM staff photo)

power trainers, by removing their engines and replacing them with seats for the instructors.

Frank Gross is shown next in his office at the F. R. Gross Company, in Stow, OH. Incorporated in 1955, his company manufac-



(NSM staff photos)



John C. Seymour introducing his father, Edgar D. Seymour (right) at the Hall of Fame induction.

tures patented heating and cooling rolls for the printing, plastics, and converting industries.

There followed a succession of shots on the discovery of the wrecked Gross Sky Ghost's remains behind a barn in Gahanna, OH and of the ship's restoration in 1989.

The Gross Sky Ghost is now on display in gliding configuration, over NSM's Main Hall. A restored Baker-McMillen Cadet II was also shown as part of the museum's '95-'96 exhibit focus on American Sailplane Designers and Builders.

Another group of slides showed Jim Stoia rebuilding the Gross/Baker-McMillen Cadet II in his Manning, SC hangar in 1995. There was a shot of the rebuilt Cadet II, ready for a shockcord launch; then one of the Cadet II at last year's International Vintage Sailplane Meet at Harris Hill, Elmira, NY.

EDGAR D. SEYMOUR

"At every gliderport world-wide, there's always a person that makes it go. My dad has been that person in upstate New York for well over 40 years," wrote Edgar D. Seymour's son, John C., also a record-holding soaring champion.

The Soaring Society of America Directors agreed, after review-

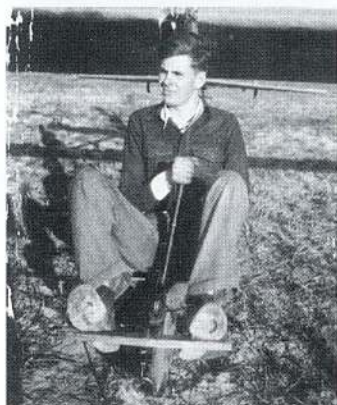
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ing Edgar D. Seymour's three and one-quarter pages of gliding and soaring records and accomplishments. He did indeed belong in soaring's prestigious Hall of Fame.

Starting in 1928, Ed and three other aspiring birdmen tested their feathers in a POPULAR MECHANICS-inspired, Northrup home-built primary glider. By 1930 the fledglings bumped and thumped their way into the sky at Philadelphia's newly opened Wings Field. Ed logged 121 flights in the primary and auto-towed for early American soaring trailblazer, Lewin B. Barringer.

Octogenarian Seymour, a professional engineer, is from Cedar Falls, IA, and retired after 40 years with the Rochester, NY, Eastman Kodak Company. Ed joined the Rochester Soaring Club in 1952, then soloed in the club's Schweizer 2-22. The following year he cross-countryed the 2-22 twenty-seven miles, earned his commercial glider rating, won his Silver "C" in the 2-22, and be-



Edgar Seymour in the Northrup Primary glider, 1931. "We appeared at Wings Field (Philadelphia, PA) the day they took the fences down and started to use the field as an airport." (Seymour photo)

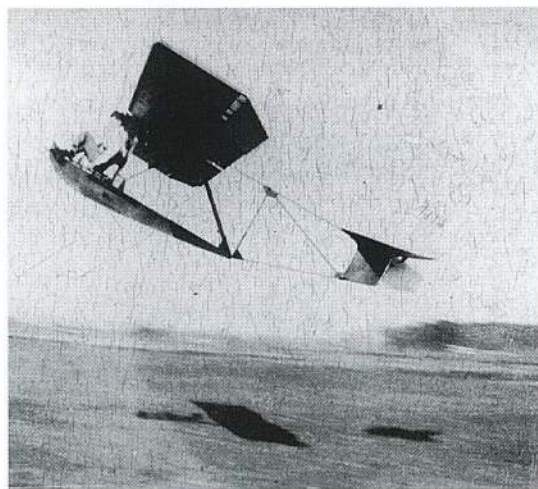
came treasurer of the RSC. The next year he became its president and edited the club's newsletter, "DOPE." A Certified Glider Instructor rating was

next, then CAA and FAA Glider Examiner. In 1959, Seymour became the SSA Director for Region III.

Concurrently, the new Hall of Famer was at Kodak working in research and development of photographic cameras, photo processing equipment, manufacturing and testing. He wrote reports on precision optical equipment, aerial and satellite photography, testing large optics using lasers, and computronics.

For most of us that would constitute a full dance card...not for Seymour. There was something in his scientific psyche that compelled him to tinker with the laws of gravity. In 1956 he represented the United States in the Winter Olympics at Cortina, Italy, on the two-man bobsled team. Seymour and his teammate slashed and hurtled down the chute to a respectable sixth place.

During another gravitationally challenging outing in 1960, Seymour broke the right wing of a Schweizer 1-26 while per-



Car launch, Edgar Seymour in the Northrup Primary, Wings Field, 1931 (Seymour photo)



Seymour in the Northrup Primary, 1931, "I tripped the shutter with my left hand at the height of the auto tow (about 100 feet)...The camera was a Kodak folding type and I used a thread connected to the shutter release. The camera was mounted on a flying wire bracket." (Seymour photo)

forming aerobatics. Quickly utilizing another anti-gravity device, he bailed out. The parachute puffed open, but the swirling 1-26 ran into it! "We tore loose and the chute opened again," he said. "Broke both ankles in a stand-up landing; the 1-26, a total loss," he added. That's how he became a member of the Caterpillar Club.

That decade was an exciting and expansive one for Seymour's flight career. He earned his commercial power and multi-engine ratings, started towing for the Rochester Club and became one of the founders of the Dansville (NY) Soaring Club. He was awarded the Gold "C." At a June cross-country from Adrian, MI, to Elida, OH, he broke the left wing and fuselage of his Schleicher Ka6-CR. "I was shook up and the sailplane required extensive repair," he lamented.

By October 1969 Seymour had a new Ka6-E in which he soared over Mount Washington for an altitude gain of 21,200 feet, to complete his Diamond requirements (badge No. 125, World No.799). Three days later, he and the Ka6-E set a New Hampshire State record of 29,200 feet and an altitude gain of 25,900 feet. Both these records exceeded any soaring altitude gain east of the Rocky Mountains.

From 1964 to 1975 the Hall of Fame honoree set eight New York State soaring records. While he was Director of the Glider Pilots Ground School, 1974-95, the organization held over 300 classes in 54 different cities. Over 2,900 pilots attended. He still found time and energy to fly in several Region III and National

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The Seymour family - left to right standing: William W. Subers, Virginia Subers, Rev. Edward Hailwood, Ruth Alice Hailwood, John C. Seymour, David E. Seymour, Annie Seymour, Kathy Seymour Gister, Elizabeth (Mrs Edgar) S. Seymour, Edgar D. Seymour - kneeling, David's sons Timothy & Matthew Seymour (NSM staff photo)

Treasures—Past and Present

by Jaye Fish, NSM Director of Development

March 1996 marked the reinstitution of the position of Director of Development at the National Soaring Museum. This is a fascinating and exciting place to work, surrounded by Elmira, New York's rich history of motorless flight and a host of people who have been involved in soaring for years.

What a privilege it is to be able to hear Paul Schweizer relive his first national here in 1931. Or listen as his wife Virginia inspire teenaged girls to achieve all they can. Or just to circle with NSM Trustee John "Corky" Gill above the wide valley and friendly ridges that brought soaring here in the early days and keep two glider fields active today.

The National Soaring Museum holds the world's largest collection of gliders and sailplanes. Most people associate the Museum with vintage craft, such as those designed by Bowlus, Franklin, and Gross. Rare or lost early gliders are represented here by replicas (Chanute, Herring, Wright, Dagling). NSM even exhibits a piece of the original wing fabric from the 1903 Wright Flyer.

Such wondrous craft and the stories they tell about the formative years of aviation are well-represented in NSM's collection and on the exhibit floor. But ships preserved by the Museum run the gamut from the 1929 Baker-McMillen Cadet Jack O'Meara flew to demonstrate Elmira's potential as a national soaring center, to motorgliders, soaring "wings," and several of Dick Schreder's record-setting "HP" series.

Between ten and twelve ships are on display at NSM at any one time, with about that same number on loan to other museums. The care and storage of the other forty-plus planes is a continuing challenge. Many are delicate. Some are fabricated of thinly plied wood like the Hirth Wolf (1935) or fabric over wood and metal like the Pratt Read PR-G1 (1942). Even the fiberglass and bonded aluminum surfaces of our Laister Nugget (1970) need care.

When NSM opened its present museum building to the public in 1979, it had already acquired 18 planes. Many more historic craft were contributed in the 1980s, eating up what little free space we had. Some had to be stored off-site or even held by the donors or immediately loaned to other museums.

When the Museum building was expanded in 1989, an environmentally sensitive collections storage room was added. This secure area, and the adjoining Restoration Facility, has allowed NSM to preserve the forerunners of today's high-performance sailplanes and bring others back to life.

At best, however, the 1989 addition only allowed for an addi-



NSM Trustee John "Corky" Gill piloted Jaye Fish's first sailplane ride. (NSM staff photo)

tional 12-14 sailplanes to be stored. And by then the collection was approaching sixty craft. Fortunately, not all sailplanes need fine climate control, so NSM built the first phase of a collections annex—now known as the Heritage Hangar—in 1992. Most remote storage could then be eliminated, allowing Museum staff to monitor the condition of individual craft more closely.

An active museum, of course, continues to search for specific additions to its collection. For NSM, this means being able to acquire craft representing new trends in aerodynamic design or fabrication materials as well as those with historic significance. A prime example is the Bowlus Baby Albatross BTS-100, graciously given to the Museum in 1995 by Ron Nelson and currently displayed on the exhibit floor.

Yet in the last few years, NSM has occasionally declined other donations, because once again storage space is at a premium. Talk has begun at the Museum about expanding the Heritage Hangar to at least the originally planned 6,400 sq. ft.

While this will allow for safe storage of another 10-12 planes, future acquisitions will have to be carefully screened. NSM must be assured that new acquisitions will truly enhance our ability to tell the story of soaring history as well as its personalities, scientific background, and technological advances.

Preserving the best of soaring's past and present for the betterment of future generations—that's why the National Soaring Museum was created.

Continued from Page 11- Hall of Fame Inductees

Soaring Contests, along with participation in two Canadian Contests.

He has served as Region III and National contest weatherman and New York State SSA Governor. Since 1969 he has been New York State Records Keeper. The Soaring Society of America awarded him its Exceptional Service Award in 1990.

Ed Seymour has logged over 3,950 glider hours and over 4,800 glider flights in more than 40 different gliders and sailplanes. Total flight time? —6,600 hours in both power and gliders!

**A WWI
Fokker
D-VIII
Fighter
with
engine
removed
and
converted
to a glider**



**Can anyone provide the
location and date of
this picture?**

Imaginations about Icarus - Photographic Art Exhibit at the National Soaring Museum



Left to right NSM Director James W. Swinnich, Angelika von Stocki, and NSM Trustees Paul A. Schweizer, Richard A. Horstmann, Jeffery Byard, Jan Scott, and John B. Hintz in front of von Stocki's wall-high triptych "Fall of Icarus." (NSM staff photo)

The works of internationally known German artist Angelika von Stocki will be on display through September at the National Soaring Museum. The 1996 Houston FotoFest and the NSM are the only two sites at which this touring exhibit will appear in the United States.

Von Stocki's imposing sepia photo-montages commemorate the great Pomeranian aeronaut, Otto Lilienthal, who most aerohistorians beatify as "The Father of Flight."

The show, which extends the entire length of the NSM's Hilton Honors Gallery, includes full-size panels, diptych, and triptych panels. "Imaginations About Icarus - Homage to Otto Lilienthal" is an allegory on the mythical Icarus, Lilienthal, and humankind's consuming adventure in its search for the gift of wings. The counterpoint between the two birdmen is expressed in a dramatic superimposition of artistic renderings of Icarus on outsized photographs of Lilienthal in flight.

This year is the centennial of Lilienthal's death. The German pioneer lost his life in an accident in one of his No. 11 type gliders. When he was about 50 feet high, a sudden gust pitched the tiny ship's nose up beyond its stalling point. The right wing stalled first, then dropped sharply, causing a severe side-slip. The master airman did not have enough altitude to recover, resulting in the fatal crash.

The mythical Icarus and his father Daedalus planned their escape from imprisonment by Minos, king of Crete. (1) Leaping from the ramparts of the labyrinth which Daedalus had designed, Icarus was warned not to fly too close to the sun, lest the wax bonding his feathered wings melt. Icarus, filled with the exhilaration of flight, soared to such heights that the solar energy melted the wax. With disintegrating wings Icarus crashed to his death.

Lilienthal was the most influential in a group of German aero enthusiasts, which also included his brother Gustav. They sought to develop a stable glider as the first step toward powered flight. "To design a flying machine is nothing. To build one is some-

thing. But to fly, that is everything," Lilienthal said.

Otto Lilienthal was born in the Pomeranian village of Ankalm on May 24, 1848. His technical education and natural engineering ability led him to start up his own machine shop. There, he produced marine signal devices and small steam engines.

His serious research into flight began in 1871 with a series of experiments to determine the aerodynamic principles of bird flight and their applications to machines designed for human flight.

Exploring his aerodynamic theories further, in 1891 he began building a series of gliders. These were intended to demonstrate the validity of the findings outlined in his writings. By 1896 Lilienthal had designed and built 18 different types of gliders, including 12 monoplanes and two unsuccessful powered planes.

In addition, Lilienthal was the first to be photographed in flight. These powerfully evocative pictures furnish the inspiration for von Stocki's artistic series.

Lilienthal considered his 1894 model to be the safest and most successful of his designs. The frame was constructed of willow and bamboo. Wings and tail surfaces were covered with cotton cloth. A horizontal stabilizer was connected to the frame by a pivot at the front of the rudder. The wings were designed to fold to the rear to facilitate transport and storage.

Control was achieved by shifting the position of the operator's torso and legs, thereby changing the little glider's center of gravity. Otto Lilienthal made flights of over 1,100 feet with this glider type.

Describing the von Stocki exhibit, NSM Director James W. Swinnich said, "The human spirit is captured by von Stocki's images. The National Soaring Museum is especially pleased to share her vision of pioneering and scientific daring with our visitors."

The United States tour of von Stocki's "Imaginations About Icarus - Homage to Otto Lilienthal" exhibit was underwritten by Lufthansa and the Senate of the city of Berlin.

Reference

1. Aviation - The Pioneer Years, Flight Legend, Pg. 10 - researched and edited by Ben Mackworth-Read.

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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.

The National Soaring Museum Point Loma National Landmark of Soaring San Diego, California, April 20, 1996

By Jeffery G. Byard, President, National Soaring Museum



Left to right: Bob Fronius, Dr. Don Hunsaker, and Jeffery Byard, president of the National Soaring Museum, at the unveiling of the Point Loma plaques. (Photos furnished by Jeffery G. Byard.)

At the welcoming ceremony, Jeffery G. Byard, National Soaring Museum President, noted that Point Loma is the seventh National Soaring Landmark in the NSM's ongoing historic Program. The National Landmark of Soaring Program was established on May 14, 1980 by the NSM to preserve the gliding and soaring heritage of the United States by placing commemorative markers at locations where noteworthy events in American soaring history have taken place.

The NSM's first landmark was dedicated at the Cape Cod-Corn Hill Beach, site of Ralph Stanton Barnaby's flight on August 29, 1929, in which he earned the first United States "C" Certificate for soaring. On this 15 minute soaring flight, in a German Prufing sailplane, Barnaby also became the first American to exceed Orville Wright's record soaring flight of 9 min. 45 sec. on October 24, 1911.

Here at Point Loma, Barnaby's record was soon eclipsed when, on October 20, 1929, Hawley Bowlus flew for 1 hour 21 minutes, 9 4/5 seconds in his #16 glider known as the Paperwing. This was the first soaring flight by an American to exceed one hour duration. In addition, this flight has the distinction of being the first flight by an American in an American designed and built sailplane to exceed Orville Wright's 1911 record. Also on this flight, Bowlus became the second American to earn his "C" Soaring Certificate.

In fact, the next seven American "C" certificates were earned here at Point Loma in Bowlus's sailplane. The pilots were: #3-William Van Dusen, #4-J. Alison Moore, #5-Earle R. Mitchell, #6-Albert E. Hastings, #7-John C.(Jack) Barstow, #8-Roy H. Pemberton, and #9-Charles A. Lindbergh. It is also interesting to note that Anne Morrow Lindbergh earned her "C" certificate #10 at nearby Mt. Soledad on January 30, 1930.

Hawley Bowlus continued making record-breaking flights here at Point Loma. On December 10, 1929, he upped the national

duration record to 2 hours 47 minutes 13 seconds. On January 13, 1930, he flew for 6 hours 19 minutes 3 seconds and finally, flying for 9 hours 5 minutes 27 seconds on February 23, 1930.

Perhaps the most significant and certainly the most spectacular flight here at Point Loma was John C. (Jack) Barstow's 15 hour 13 minute flight, lasting through most of the night, landing at 3:57 a.m., exceeding the existing world duration record. While this flight was an unofficial record, it served as notice to the rest of the world that the U.S.A. was to be an important contender in the realm of soaring flight from that time on.

Looking around at this rugged terrain and the distinct lack of launching and landing areas, Point Loma would be considered an

Continued on Page 15



Two quarter scale, radio controlled models of Bowlus gliders were flown during the dedication ceremony. Left is a model of a Bowlus/duPont Albatross built and flown by Dr. Alix Caldwell and at the right is Gary Fogel with his Baby Albatross model. While these models were flying in the ridge lift, they were joined in flight by an inquisitive seagull who flew along with the models for much of their flights.

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appalling soaring site by today's standards. This, and considering that some of these flights were made at night, says a lot about the pioneering spirit of the men who flew here.

The San Diego area is rich with gliding and soaring history. As far back as the 1880s, John Montgomery had conducted some of his early gliding research in this area. Shortly after Lindbergh's historic flight, Hawley Bowlus began his early sailplane manufacturing and gliding school at what is now Lindbergh Field. And finally, all of the pioneering flights here at Point Loma, at Torrey Pines, and throughout this area, have helped to advance the art, science, and sport of soaring flight to what it is today.

"I can think of no place better suited for inclusion in the National Soaring Museum's National Landmark of Soaring Program," Byard said. He thanked all of those who have worked so hard to make this landmark dedication possible:

Dr. Don Hunsaker and Jacquelyn Rice of The Environmental Trust.

The Local Landmark Committee: Bob Fronius, June Wiberg, Vic Saudek, Andrew Kecskes, John Ludowitz, and Dr. Don Hunsaker.

All of the members and volunteers of The Environmental Trust, San Diego Soaring Enthusiast, and TWITT, "The Wing Is The Thing."

Historians: Richard Benbough and Bud Perl.

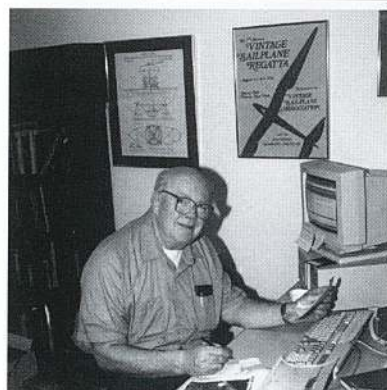
Simine Short and the National Soaring Museum's National Landmark of Soaring Committee.

He added, "I know that there must be many people who I have not mentioned. To all of you please accept my apology and my sincere gratitude for all of the work that you have done to make this National Landmark of Soaring a reality."

(Photos furnished by Jeffery G. Byard)



After the dedication, a reception was held by June Wiberg, Bob Fronius, and Doug Fronius in their "skid-row" hangar at Gillespie Field in nearby El Cajon, CA. Floyd Fronius (left) and Dominique Veillard serenading the crowd at the reception in the Fronius hangar. Above the loft can be seen the Robinson Robin IV and the Culver Screaming Weiner (later renamed the Li'l Dogie).



Ted Burris
(NSM staff photo)

Landing Out ...Stopping Out By Ted Burris, NSM Staff

"Always keep an eye out for suitable landing sites," say the manuals. Not a bad idea when you're in the air with a power plane - and an absolute necessity when you're in any kind of glider!

But you can't always do that. For instance:

There's a war going on. And you're in it — up to your eyebrows! You're the pilot of a combat glider. Your assignment is to deliver a bunch of fully armed infantry troops, or a howitzer, or two tons of ammunition, or a Jeep behind enemy lines in an area you've never been to before, or even seen, except perhaps in a reconnaissance photo.

You'll be going in at 4:15 in the morning. The weather forecast calls for low clouds and rain. Assigned altitude is 1000 feet above sea level. Your target is the bocage area near St. MerEglis. Miserable place: small fields, surrounded on all four sides by hedgerows; probably lousy with enemy.

The manuals say your WACO CG-4A has a glide ratio of 15 to 1. Ha! You'll be going in steep and hot, the so-called combat flair approach. Steep because you've got to clear the hedgerows: Hot because you want to get this mother on the ground fast to avoid ack-ack, and to get the soldiers into action. And there will be 500 other gliders up there in the night with you, all competing for the same air space!

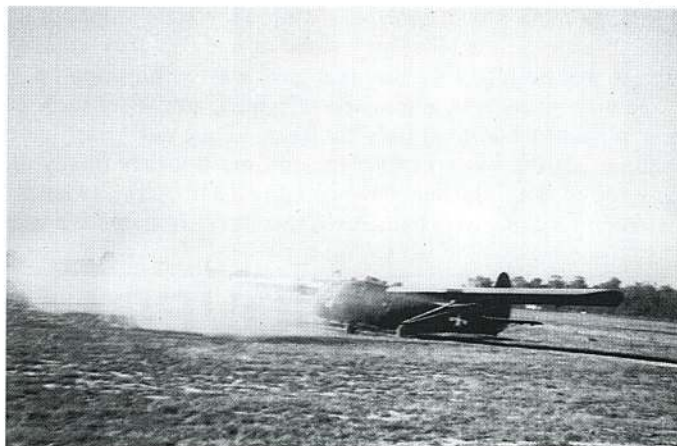
"Aye, there's the rub!" You'll hit the ground at 60 to 80

miles an hour, and there'll be a hedgerow 200 feet ahead. You'll have to get STOPPED!

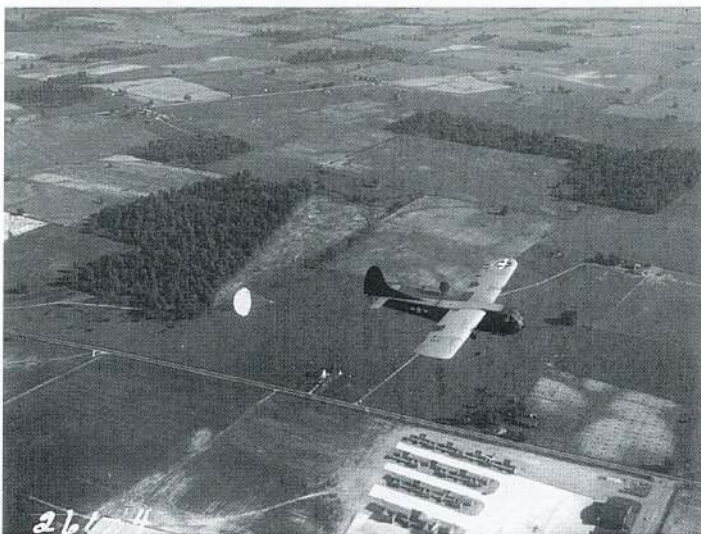
This was a serious problem for glider forces during WWII. Casualties were very high among airborne glider troops, as much from landings as from the enemy. Understandable, under the conditions, but no less a problem for all that.

The Army sought ways to accomplish safe landings through-

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Wing-mounted breaking rockets by Aerojet General have been ignited. The Waco CG4A disappears into an acrid yellow exhaust cloud. (USAAF photo, Sweet Collection, NSM Archives)



A Waco CG4A glider testing a drag chute to slow forward speed. Deploy too soon, you fell out of the sky; deploy too late, it doesn't stop you. (USAAF photo, Sweet Collection, NSM Archives)

Continued from Page 15

out the war. Any idea which offered even a chance of being usable was entertained.

Does the glider have wheels? Put brakes on them! Both disc and drum brakes were tried.

Spoilers? Try them. They might help a little.

Drogue chutes? Yes! They helped. But they were tricky. Timing was everything: deploy them too soon and they would stop you in the air — not a good thing for a glider; deploy them too late and you'd run out of Landing Zone (LZ) before they could help you.

Skids? Well, most gliders have skids anyway. Can we do anything to make them better stoppers? The answer was yes. The Cony skid kit and the Griswold-Corey nose skids were developed. Lucas landing skid shoes could be affixed to the ski type wooden landing skids to improve their performance in deceleration.

Anchors? Sound crazy? They were tried, both in the conventional sense and modified into something like a plowshare. The Danforth Plow anchor illustrates the type.

Speaking of plows, there were several. The Lee plow, the Corey plow, the Chase plow were some of the variations. They all consisted of either a symmetrical plowshare shape or heavy, angled spikes designed to dig into the ground and slow the glider by creating a furrow.

Glider fuselages had to be massively strengthened to handle the stresses these plows generated while they were stopping the plane. Even so, if the plow hit a stone or tree root that wouldn't budge, it was usually the glider that gave way by breaking up.

How about rockets, retro-rockets? Well, sure, they work on power planes as boosters; let's try them. They did. Early tests sometimes set the wings or fuselage on fire. But they finally got things sorted out. By late 1944 or early 1945 Aerojet General deceleration rockets were being used regularly. It must have been

something to see one of the deceleration rocket equipped gliders land. When the rockets were fired, the entire plane disappeared in an acrid yellow fog of exhaust gasses.

Let's talk about anchors again. There was a type of anchor spike fired from a bazooka nearly straight into the ground. This was attached to a spring loaded payout drum that reluctantly shed line, first slowing, then stopping the glider.

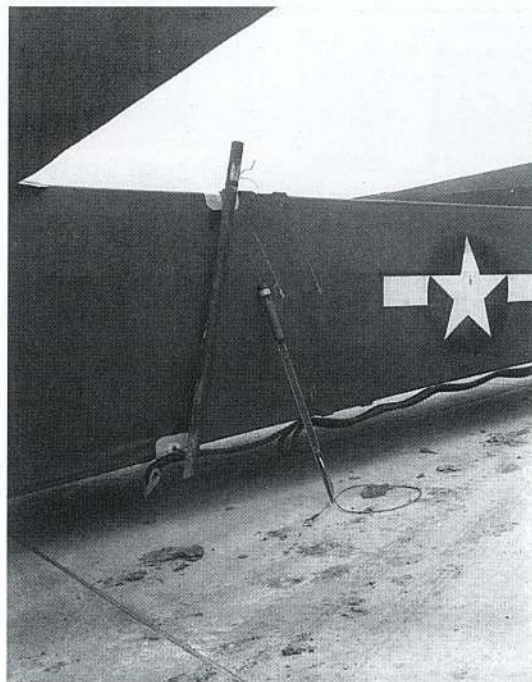
Still haven't stopped? Only one thing left to do. Ideally, you should head for the nearest trees. Try to find a couple that are about 20 feet apart and go between them! The impact will tear the wings off! But that will, hopefully, bring your glider to a stop with its cargo more or less intact.

In the last analysis combat gliders were expendable, one-trip, one-way transportation. They made practical the tactical doctrine of vertical envelopment (now done by helicopters). They were intended to land out and bring pressure on the enemy from the unexpected quarter. If the cost was high, so be it! They were the cutting edge of the "Great Swift Sword."

The information in this article was gleaned mostly from photographic negatives donated to the National Soaring Museum from the personal collection of Lt. Col. (Ret.) Floyd Sweet, who, during WWII, was in the forefront of the research to expand the utility, capability, and safety of the Army's glider forces.

Thanks, Floyd!

Come to the National Soaring Museum in Elmira, N.Y. and see our WACO CG-4A combat glider and all the other historic motorless aircraft in our collection.



The "Bazooka" fixed on this glider fired an anchor (leaning) into the ground. The anchor line (under the fuselage) played out until the glider stopped. (USAAF photo, Sweet Collection, NSM Archives)

ON THE COVER

A George Uveges photo of Ross Briegleb in his Briegleb BG 12B entitled "Down Under." The wingover shot was taken over El Mirage Dry Lake, CA, overlooking Shadow Mountain in October of either 1967 or 1968 according to the pilot. (NSM Archives)

Rope Break!

In the 1995 Vol 17, No. 2 NSM Historical Journal, pg. 3, in the "A Conversation with Martin Simons and Chris Wills at the 1995 International Vintage Sailplane Meet" article, the title of Martin Simons' new book is erroneously given.

The correct title is **Slingsby Sailplanes, A comprehensive History of All Designs**. Those interested in U.S. distribution dates may wish to contact Mr. Simons, whose address is 13 Loch Street, Stepney, South Australia 5069.