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Charlie Spratt and Rudolph Opitz Honored During 40th Annual United States Soaring Hall of Fame Induction Ceremonies at the National Soaring Museum



Opening remarks by Gene Hammond,
Soaring Society of America, Vice
President

Paul Rudolph (Rudy) Opitz, Stratford, CT, and Charlie Spratt, Charlotte, NC, have joined 91 other outstanding motorless flight personalities in the United States Soaring Hall of Fame. The National Soaring Museum, celebrating its 25th year, hosted the induction ceremonies Saturday, May 14, 1994, in the Museum's Edward A. Mooers Community Room, Harris Hill, Elmira. The award is given to those who have made "noteworthy contributions to the sport of soaring as determined by the Soaring Society of America Directors."

NSM Executive Director James W. Swinnich first called on John R. Boyce, Bethany, CT, an old friend and soaring associate of Opitz to introduce the pioneer octogenarian.

Director Swinnich next invited 1980 Hall of Famer, American record holder, and world soaring competition pilot, Karl H. Striedieck, Port Matilda, PA, to present Charlie Spratt.

Paul Rudolph (Rudy) Opitz

Boyce, a retired airlines captain, said that when he asked Rudy Opitz about his first glider flight, it was like opening the flood gates to a dam of soaring history. For two hours he listened to tales of historic events and comments on the people involved. "There was never a dull moment," he said.

Paul Rudolph Opitz was born in 1910 in Landeshut, Silesia, Germany. "Not far from the town of Grunau," Boyce smiled. "Does that ring a bell?" (A renowned glider building and soaring location.)

His gliding career started with the treacherously fickle machines of the late 20's on the German Wasserkuppe. Opitz was a member of the Frankfurt/Oder Glider Club (Southeast of Berlin). Opitz told him that the members would bungee-launch in the club's Zoegling glider for 20-second average flights to the valley floor - not good enough to qualify for the 30-second coveted "A" soaring badge.

Boyce said Rudy soon wanted a little more organized experience so he went to the Baltic area for some lessons. "He came up with an 'A' badge - so of course they made him the club instructor."

Thus encouraged, Rudy packed his suitcase, put it on a train, then bicycled 300 kilometers to "a declared goal," the mecca of German soaring, the Wasserkuppe. "He flew gliders all day and rebuilt them all night," Boyce chuckled. "His experience as an apprentice cabinet maker came into very good use."

This was happening in the midst of the equivalent of the German National Contest. All the soaring luminaries of the day were there and Opitz was crewing for his instructor. One of the contestants, Rudy told Boyce, was Robert Kronfeld, a soaring pioneer thought to be the inventor of the variometer. Kronfeld wanted a sailplane "with legs," some-



Charlie Spratt



Rudy Opitz

Continued on Page 3



1. From 1929 to 1931 Opitz held membership in the Frankfurt/Oder glider club, located S.E. of Berlin, Germany. The picture shows just what it took to get our "Zoegling" returned to the take-off site," Opitz said.

2. Opitz with his almost finished glider. "It took me almost 18 months to build it in my spare time. The 'President' was designed by Lippisch with cloud flying in mind."

3. The finished product in flight and registered in Opitz' name as "D HABICHT" in 1935.

4. The rocket powered Me 163a high speed delta wing research aircraft designed by Lippisch. First flown under rocket power in the summer of 1941 by Henri Dittmar.

5. In the cockpit of the Me 163a. Note, the canopy is hinged at the back. Me 163b was the first rocket powered fighter aircraft to be flown in combat. "As the project pilot I made the first rocket powered flight with this aircraft on June 24, 1943," Opitz said.

6. Entering the cockpit of the Me 163b, note the bullet proof glass on top of the instrument panel.

7. Opitz in the cockpit of the Me 163b, wearing a camera, attached with a headband to his forehead to record vital test data in flight.

8. Now in a museum near Munich, this DFS 230 was built from scratch by former DFS 230 cargo glider pilots.

9. Cockpit of the DFS 230.

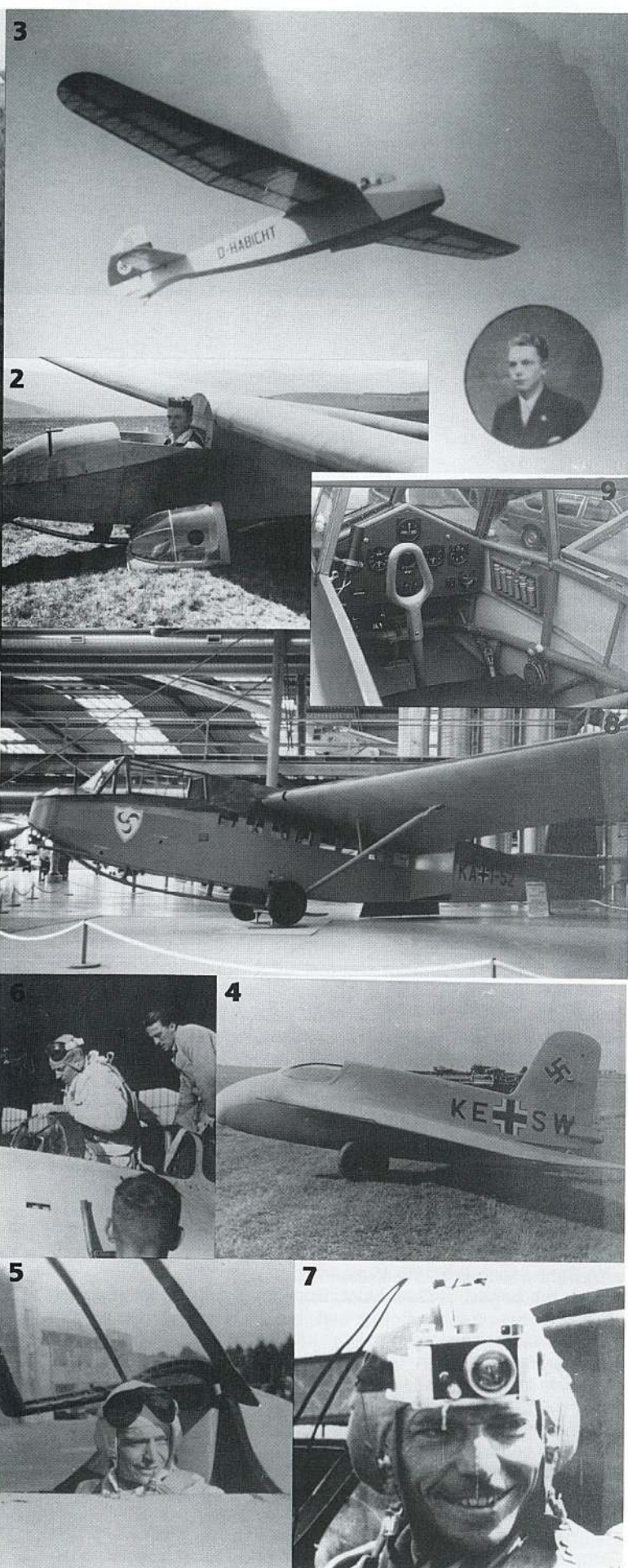
Photos from personal collection of Rudy Opitz

Continued from Page 2

thing with reach that would get him off the Wasserkuppe's ridges and into flight-sustaining thermal lift. Kronfeld had a monstrous custom-built 30 meter, cantilevered wingspread ship. "In those days a wooden cantilevered wing (no external struts) of that size was no mean accomplishment," Boyce said. Opitz' story continued with Kronfeld launching himself off the Wasserkuppe toward a line of building thunderstorms. Closer and closer he went, eventually disappearing into the clouds. Soon viewers saw pieces of glider falling out of the clouds, accompanied by the surviving Kronfeld under a billowing chute.

Opitz became a certified glider instructor at the Wasserkuppe school in 1934 and in his spare time the following 18 months, built his own glider. The ship, a "D Habicht-

Continued on Page 4





Opitz and the Horten IV at the 1952 Toledo, OH meet.



Pre-flight adjustment to the Horten IV at the Toledo meet.

Continued from Page 3

President" was designed by Dr. Walter Lippisch especially for cloud flying. "Dr. Lippisch, who was involved with the establishment of the DFS (Deutsches Forschungsinstitut für Segelflug) moved from the Wasserkuppe to Darmstadt in 1936, taking Rudy with him as test pilot," Boyce said. There, from '37 to '40, Opitz made test flights of Dr. Lippisch's flying wing projects.

With the beginning of hostilities in 1939, Rudy was drafted into the Luftwaffe and served as technical officer at the Cargo Glider Training School. Boyce said that Opitz participated in the world's first glider assaults on the bridges crossing the Belgian River Meuse and the fortress of Eben Emael during the opening phase of the 1940 European campaign. Boyce continued, "They achieved such success with those 40 gliders that Luftwaffe officials started a massive glider building program that resulted in Rudy's being picked as an instructor."

During this time, Dr. Lippisch's rocket-powered fighter plane was being developed, eventually to be built by the Messerschmitt organization. Boyce said that although Rudy knew something was going on in that area, he was unaware of what it was. Then he received a phone call from General Udet (Ernst Udet, a famous WWI ace was second only to Von Richthofen with 62 aerial victories. At this time Udet was Luftwaffe inspector of fighter and dive bomber pilots.) Boyce added, "Opitz thought someone was pulling his leg; Luftwaffe generals didn't call lowly glider instructors just to talk."

It seems that high German officials, observing development on the Messerschmitt 163 rocket plane at Peenemuende feared that an accident would jeopardize the program. They threatened to halt work unless a back-up test pilot was brought in because if anything happened to the pilot, the program would be lost. The ME 163 "Komet" was first flown under rocket power in the summer of 1941 by Heini Dittmar. (In 1937, Dittmar, a world-renowned sail-planer, broke Richard DuPont's world distance record with a 123-mile flight during the 15th Wasserkuppe contest.)

At the behest of Gen. Udet, Rudy assumed his duties as test pilot at Peenemuende. Boyce said that Opitz at first didn't realize what he was getting into. He didn't know that he would be testing a rocket powered fighter. Rudy told Boyce that the ME 163 was an easy ship to fly, but it was not an easy ship to keep operating safely. Opitz remained with the ME 163 program, particularly during the hot and dangerous developmental stages of the rocket engine. He also was engaged in training operational units. The project was plagued by so many technical, supply and political delays that it was very late in the war before the airplane became operational. "About that time hostilities ended," Boyce said.

In 1946, the U.S. Army Air Force, as it was then known, drafted Rudy along with other German pilots and rocket specialists, in-

cluding such scientists as Werner Von Braun, to the United States. Opitz went to Wright-Patterson, Dayton, where he did research on rigid bar glider tow mechanisms. (NSM Quarterly, Fall 1988, pp3-5)

Boyce said that during that time Rudy also was working with Dr. August "Gus" Raspet at Mississippi State doing research on low speed aerodynamics and boundary layer control. Around this time the "Horten IV" flying wing was brought to this country and was in a serious state of disrepair. Boyce continued, "Rudy got hold of it, repaired it and flew it in the '52 Nationals, but he'll tell you more about that." In 1956 he came to Connecticut's Avco-Lycoming as a flight test engineer, retiring in 1975.

"To those of us in the Nutmeg Soaring Association," Boyce remarked, "Rudy has been a most important character; he has officiated as an FAA flight examiner, given instructional flights and taught thousands to fly." Boyce added that Opitz also taught people responsibility and skills that can only come from someone who has them himself. Boyce laughed, "He taught me how to soar - which wasn't his most notable contribution."

Opitz holds U.S. Diamond #6 and International #10. He delivered the 1988 Ralph S. Barnaby Lecture, (NSM Quarterly 1988, pp3-5) addressed groups at the Smithsonian Air and Space Museum, and the U.S. Air Force Museum. He is an honorary member of the Society of Experimental Test Pilots.

Boyce said, "I'm very proud to introduce my friend Paul Rudy Opitz as an inductee into the United States Soaring Hall of Fame."

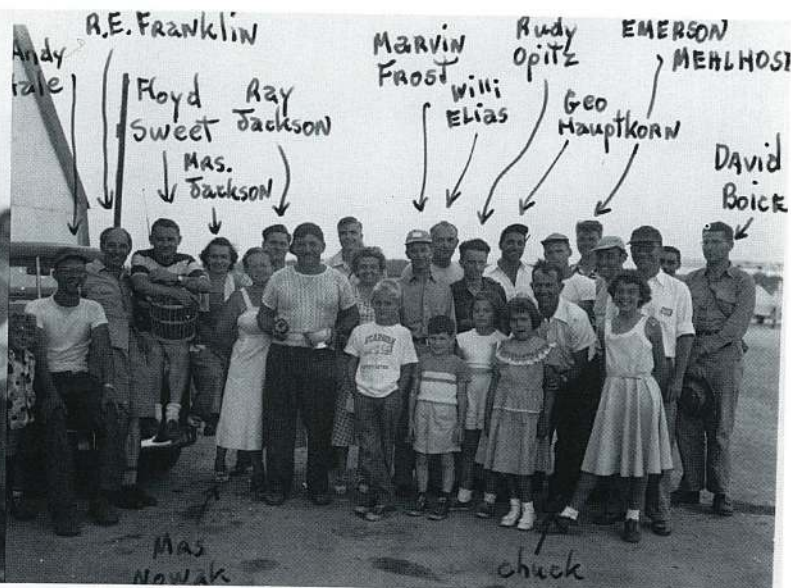
Amid a standing ovation, under a shock of wavy gray hair and with a etched face that would lead you to subtract 20 years from his octogenarian vintage, Paul Rudolph Opitz stepped smartly to the podium.

He said, "When SSA Director John Goode notified me that I had been selected for induction in the U.S. Soaring Hall of Fame, it had never even crossed my mind that I would be selected for this honor. But I'm here tonight with my dear wife, Hanna, and my family." Accompanying the couple were their sons, Martin and his wife, Amy; and Michael, a U.S. Soaring Champion and member of the U.S. Soaring Team, his wife, Nancy, and grandson, Michael.

Opitz recalled that when he came to the states as a German National in 1946, he had great difficulty in getting a license. First he obtained a waiver and finally his license. At Wright Field where he was working on the rigid tow project, he met Paul Bikle and Floyd Sweet (Hall of Fame 1960 and 1963, respectively) and was invited to join the Dayton Soaring Society.

It was then that Rudy learned that the Horten IV flying wing, best known of the pre-WWII flying wings, had been brought to America. "It was special to me because I had been heavily involved in flying wing research with Reimar Horten," he said. In 1940 Reimar Horten was technical officer of Luftflotten Glider

Continued on Page 5



Opitz receiving the L. O. F. Trophy from John Nowak (left) and Prof. R. E. Franklin (second from left), 1952, Toledo.

Continued from Page 4

School #1, where Opitz was in charge of flight training, and they became good friends. "Reimar even managed to fit the Horten IV into this military environment, using Luftwaffe shops and facilities," Opitz added.

Unfortunately the pilot who brought the flying wing to the United States "dinged it when he tried to fly it," Rudy said. "and couldn't find anyone or any technical school that had the know-how to rebuild it."

The damaged Horten IV was trailered from North Dakota to Dayton, IL. Opitz then proceeded to reconstruct the unique machine in another friend's chicken coop...a long chicken coop. The Horten has a wingspread of 65.6 feet. The scimitar shaped beauty with the strange pod was finished in 1952, just in time for Dayton's Wright Memorial Glider Meet. All Opitz had to do was get to get it certificated from the Cincinnati FAA...well, almost all.

The Cincinnati FAA office bucked Opitz's licensing request to its engineering office in Chicago. After some administrative headscratching, the FAA engineers wanted a builder's statement or some sort of proof that the Horten IV was repaired in accordance with the manufacturer's specifications. Rudy explained that no proof existed this side of the Atlantic and most documentation on the other side of the Atlantic was destroyed during the war. Further, he had been involved in the testing of the original ship. Opitz submitted a statement to that effect and the ship was duly licensed.

His troubles still weren't over.

The handshake agreement with the Horten's owner, Hollis But-ton, was that after the ship was repaired, Opitz would fly it and insure it for the flying season, but Rudy could find no insurer to underwrite the venture.

Reporting the situation to Hollis, the flying wing veteran was told - no insurance, no flight. The situation looked bleak. Opitz had just bought a house; a family increase was on the way and finances were strained. But he had to fly the Horten.

"It was a risk I had to take," he emphasized. "Floyd Sweet graciously agreed to tow me; everything went very well. Some problems with directional controllability on tow, but I thought I could handle that if I bought a longer tow rope."

Hollis arrived the next day and met with Sweet and the Dayton Club's Board of Directors. They pointed out to Hollis that he had already lost his investment when the aircraft was wrecked. Now the Horten IV was fully flyable again. "...and all you can do is take a chance that you'll lose it again," Opitz reported them as saying, adding, "Even then, at worst, you'll be back to zero, where you started." Meantime, when the agreement was finally reached to let him fly, the Wright Memorial Event was already a day old. Rudy

Pilots and crews at the 1952 Toledo Meet.

entered the second day and was lucky enough to draw an early take-off slot; there were 40 entrants and only one towplane. "I wanted time to re-learn how to handle that thing," the new entrant said. "It was not only a flying wing (with a different control system); it had a prone-position pilot seat."

He won the meet. He also won the next sailplane contest in Toledo, OH. Then he took the Horten IV to Grand Prairie, TX, for the 1952 Nationals. Everywhere he went, the ship created so much interest that at one point, "It almost got me in serious trouble." Opitz went on to explain that the incident happened on an open distance contest day when everyone flew as far as possible.

Opitz sliced out from the Grand Prairie starting grid in the flying wing, heading for Abilene. After several weather and thermal induced course changes, he found himself over very thinly populated and rough country.

"All of a sudden I heard engine noises. An aircraft came from behind, dead center, not more than 100 feet over me," he said. The interloper went into a very steep climb and Opitz recognized a T-28. They made another pass and "the terrible down wash and prop wash really battered me around...I was shocked." Again, another pass, and yet another. "I was furious; I didn't know what to do." The next pass they lowered the T-28's gear and flaps to slow the ship down for a better look.

Having lost a lot of altitude, Rudy started to scan the inhospitable terrain for a landing. "Then, about two miles ahead of me, a very strong 'dust devil' came to my rescue." When he came close to the ascending column, Opitz knifed the Horten into a steep turn, centering it and climbing in the now strong thermal right up to the cloud base. Rudy could see the trailing T-28 and spiraled the tail-less bird on up until the pursuer was lost.

"Incredible..." The speaker said shaking his head, and adding, "but then UFO phobia was rampant in 1952; few weeks went by without some wild story about a UFO sighting. The only thing that I could think of was that this guy (in the T-28) figured 'here's one of them; maybe we can force that little green fellow from Mars to the ground.'"

While he didn't make it to Abilene because of his problems with the UFO hunters, Rudy, in the Horten IV, did get 300 miles out to Midland and won a cash prize for being the first to land there.

"I finished the contest in seventh position but it wasn't the airplane that was responsible," Opitz said. "A triangle flight was called for on one of the contest's last days. You really had to fly over the turn points to find them. Well, I got lost. In my trials to find the turn point I lost time. I landed out and was pushed back to finishing seventh."

He closed saying, "I am very proud of this very high honor and I want to thank all of you. If the Lord will give me a little bit longer, and the good doctors will sign my medical again, I will be able to do a little bit more flying and, of course, soaring, my first choice."

Charlie Spratt

Calling Charlie Spratt the nation's most sought-after soaring competition director, distance record-holder and U.S. Team Member Karl Striedieck (Hall of Fame, 1980) told Hall of Fame banqueters that the 1993 inductee had worked at 198 regional contests, two Nationals and two World Championships.

Spratt has served as director of 79 of the Regionals and 28 of the Nationals - "Which means that he's the boss and has the responsibility for the conduct of these competitions," Striedieck said.

Cataloguing Spratt's accomplishments, Striedieck added that Spratt has published 110 newsletters and written several articles for SOARING magazine.

"I've been a 'Charlie watcher' since about 1974 when I first met him in Chester (SC)," Striedieck said. He added that it has been said that Charlie's career started around 1969 when he just wandered down to the airport, became an airport junkie "like the rest of us," ending up at Chester and getting involved in sailplane competition. Striedieck said that he was able to see Charlie evolve from the kind of person who just "showed up" at soaring events, to the person who is the nation's most sought-after competition director. Internationally, his reputation as a contest director is well-known and respected.

"During his successful climb, Charlie has conquered a lot of obstacles," Striedieck said, then added, "No, not conquered, because if you conquer, someone gets defeated and Charlie does not defeat people. He wins." The speaker said that Charlie attains his objectives in such a way that everybody comes out a winner. It's one of his strongest points. "He's made some big sacrifices in his personal life, in his relationships and of course, financially, to make the sport a whole lot better," Striedieck said.

He said that there were dozens of kids, and maybe one or two in this audience, who aren't kids anymore, who remember how Charlie touched their lives. One of those was Dirk Elber (Newport News, VA) who wrote a poem in praise of Charlie. "I'd like to read it to you," Striedieck said. "It's better than I could say."

Charlie.

Who is this man with the common name?

To the soaring community there is only one Charlie.

What is he...the best competition pilot?

Hardly,

The top meteorologist?

No, but he does know about weather.

No, this red-headed Carolinian is known near and far as the best at his job.

He controls the doors to the contest path.

Diligence, patience and iron rules;

That's how he deals with the contest world.

Warmhearted, and a quick joke;

That's how he deals with the rest of the world.

But his work aside, it is his cohorts that bring him respect of the many airport parents.

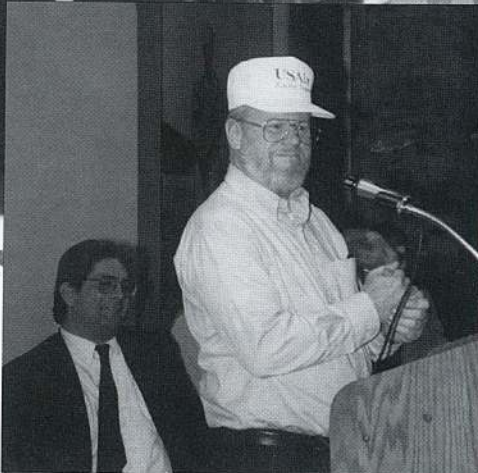
Continued on Page 7



Spratt reading "What Soaring Has Meant to Me."



Below: Contest Director Charlie Spratt



Above: Spratt peeling off his coat and tie, "I set a world record today in that I've worn a coat and tie longer than I ever have in my whole life."

INSET: Grabbing a duck-bill cap and clamping it on his carrot top, he added, "I can hardly talk about soaring without wearing a ball cap - no one would recognize me."



Spratt at home on the sailplane contest starting grid.

Continued from Page 6

He finds the airport brats; spoiled kids of pilots.

In an hour he has trained them to use their youth for the good of the sport.

Good RS and the gate is full of kids and their coke bottle binoculars, scanning the skies.

Fast legs, Charlie calls and has an errand for us.

This is Charlie's way of running the best organized gate in the world.

For his work, a full-time volunteer job, the home of the soaring community welcomes this man.

From the view from one of his brats, I say, "Thanks for the experiences; for they are ones I will not soon forget."

So, for that I say, "Charlie Spratt, good thanks..."

Striedieck concluded by saying that when we're all retired or up in cloud heaven, we'll be reminiscing about all the great people we've known in soaring. "The person that we're going to remember the very longest because he's touched more than the mechanical part of our lives is this guy right here...Charlie Spratt," he said amid cheers and a room-shaking ovation.

Spratt opened by saying that he was honored to be here along with Rudy Opitz, one of his childhood heroes. He allowed that he had set a world record today in that he had worn a coat and tie longer than he ever had in his life. He continued, "I have a hard time talking about soaring with a tie on." Then, grabbing a duck-bill cap and clamping it over his carrot top, he added, to cheers from the audience, "I can hardly talk about it without wearing a ball cap either."

Spratt said that this was truly a great occasion for him. He was very excited about it so he asked friends what he should do and received many suggestions.

"The one that I took up on," he said, was, 'What Soaring Has Meant To Me.' I want to read it to you, because I want to make sure that I get it all in there.

"Soaring is waking up, looking out of my old van and knowing that we will race today, looking down an empty ramp with dew glistening off the wings of sailplanes at rest, the quiet breakfast in the camping area with small talk and the smell of coffee. Soaring is the conversational hum that always precedes a pilots' meeting - intense and yet comforting - these meetings squeeze the glue that holds us all together. The winners talk, always with confidence; the launchmaster's stern look as he describes 'the way it will be', the endless search for the perfect ballast system; and the endless waiting at the water for a turn to fill and heave those heavy water bags.

Soaring is the grid shuffle where man and machine melt into a geometric form that has been the subject of a thousand photos; the sound of the first tug's crank up; and the building excitement as each engine fires. Soaring is the true beauty of the first launch, like a string of pearls that stretches from the ground to the blossoming sky. Like magic, the gaggles form and soon the sky is filled with a dance that has inspired me since the first time I saw it. Soaring is the tension the first call to the gate brings on, the rush of excitement as the leaders call IP; the sound of a sailplane at speed, from on high a whisper that becomes a roar as the planes hit the mark time and time again; the moment of peace when it is clear they are all on course.

"Soaring is the quiet time between the starts and the finish when all of us who support the racers sit and wait. Soaring is the snap to attention that can only come from the first 'two minutes out call' - searching the horizon for that little white slit in the blue - suddenly seeing the smoke of ballast release and hearing the ever called 'I see him'. Soaring is the sound of a sailplane at redline as it crosses the finish line, a sound that chirps like no other on the face of the earth. The release I feel as I say the word 'good finish', the wave from the cockpit, and the cool slap of ballast as it sprays across the gate are true marks on my life. Soaring is the wait for that last pilot to cross the finish line long after all the others. Soaring is the grace of the landing, the sound of the whoop as pilots open the canopies after a good day, hearing the war stories as the crews wash the wings and rip the tape, the gathering at the turn-in, the intense search for their names on the core sheets, and the hands in the air explaining every turn and every thermal. Soaring is the smile on the winner's face and the disappointment in the eyes of the losers. Soaring is the true feeling of family as we gather at some watering hole, eating and talking about all the things that bond us. Soaring is watching the sun go down on the ramp with a beer in one hand and a set of liars dice in the other, the laughs you get from corny jokes and the pleasure of being among your own. Soaring is lying down with the breeze blowing though, seeing a clear sky full of starts and knowing that tomorrow will bring another day of what you love best.

"I have traveled the world, as though a millionaire, stopping where I wanted and doing what I wanted. I have stood on the ancient wrinkles of the Appalachians, and watched my friends roar by at speed, and I have stood on the desert floor and stared into the blue for that little white spot climbing in the wave. I have heard the thunder over the Whites, and the thunder in the winner's heart. I have seen the storms over Hutch, and felt the heat of Cordele. I have seen the water freeze in the dump valves at Chester, and sailplanes launched as the snow was flying at 'The ridge.' I have seen the mark reach 110 on the ramp at Marfa and the rain gauge overflow at Ionia. I have smelled the oil fields of

Continued on Page 8



A gag shot of Spratt as the "Red Baron."



Charlie and "his kids" at the contest starting gate.

Continued from Page 7

Hobbs and felt the humidity of Winterhaven. I have stood in the open at Uvalde and enjoyed the shade of Sugarbush. I have roamed through every state in the union, in every season. I have adventured in exotic places like New Zealand, South Africa, Europe and South America, all because of my love for this sport. It has been an amazing junket and a gift I will never forget.

"Nothing will ever compare to the people. For me, for all these years it has been the people of Soaring that have kept me close. I grew up in soaring. I matured in soaring - well maybe not completely! I have stood in a circle of champions and been accepted. I have seen the new ones with their hope and aspirations on their sleeves. I have seen them grow and I have seen them go. I have seen the test of character a thousand times and I have seen those who passed and those who failed. Each race is a play and everyone has a part - the champion, the vanquished, the supporters and the supported, the cheerleader and the antagonist - with cumulus clouds for a stage and runways for props. I am the most fortunate of all because I was a part of it all.

"I have been 'high-fived' by a fourteen-year-old who just saw every contest number on every wing that passed over him during a sixty-plane start. I have been called 'cool' by a group of teenagers as I made sure they got to a pool after every gate. I have watched a young girl take the responsibility of timing with a confidence never displayed before. I have seen them awaken to the sport and known they would never give it up. I have had kids in my van, in my hair, and in my way and I loved every minute of it. They have traveled with me, tortured me and amazed me. I am convinced that if I could harness the power of their laughter, I could live forever. For when I am with them - I am never more alive.

"The women - Oh, the women. Women windblown, women without makeup and without fashion, and yet more beautiful than any model in any magazine. True women, intelligent women who have shown me all facets of the opposite sex. Women who have been real friends and have shared their feelings with me. I have seen them enjoy the fact that their mate's joy is in soaring and have supported this endeavor without understanding the joy themselves. I have spent time with many and touched a precious few. I have flirted and romanced with Soaring as the wine. Holding hands on long walks down darkened runways or embracing under a wing - the passion all the stronger because of Soaring. Although none of these encounters has led to a permanent bond, I continue to see that one that will love me and give me the freedom to chase my dreams in Soaring.

"I have been fired in controversy and quenched in acceptance. I have wandered through the politics of Soaring and moved from an outsider into the very center of the beast. I have created power-

ful enemies and even more powerful allies. I have won battles and lost wars, used compromise and gained insight. I have been a leader and I have been led. I've made poor decisions and at times appeared to be a genius. I have agonized over rules and been glad I had them to fall back on. I have felt the sting of real mistakes and the pleasure of a job well done. Soaring has given me the chance to use my brain and personality in a most unique way.

"When the final account is called, I will stand at some gate on some airport with the realization that I have lived an amazing life, as I am living it now. No amount of money or power could give me what Soaring has laid before me. I could not imagine a greater adventure for myself. I have cussed, cried, danced, laughed and done it all on the silent white wings of Soaring. I have never pursued money or material things - they only slow me down - but when the time comes to count it up, I will be a multimillionaire, not in dollars, but in experience, memories and best of all, Friends. Soaring has given me all of this and I will forever be truly thankful for this wonderful gift."

Spratt repeated a hilarious incident that he wrote about in the September, 1986, SOARING magazine entitled, "Charlie and the Cadet Clipper - What to Do after the Flying Is Over." It involved his "Ramp Cadets," boys and girls who worked on the gate and flight line during the contest, and the "Cadet Clipper." "The Clipper" was a marginally ambulatory, fizzled-out Rambler Wagon, navigated from its roof by a system of ropes tied to the steering wheel. At nightfall, with Captain Spratt on the ropes topside, and "The Clipper" manned by as many kids as could hang on, the phantom ark chugged up, down and across "The Sea of Hobbs," nine and one-half miles of open, deserted runways, trailing strains of C & W by Willie Nelson and Hank Williams, Jr. on the car radio. Unfortunately for the moonlight revelers, the Hobbs Coast Guard in the form of two police cars put out on "The Sea Of Hobbs" to intercept. Spratt said they managed to elude their pursuers and a whole new dynamic was added to the juniors' participation in that contest.

Ever the pixie, Spratt proceeded to describe the workings of the "Ug-oh Squad." He related the precipitating incident that led to the deployment of the "Ug-oh" Squad. In the haste of pre-grid maneuvering, a 4WD vehicle inadvertently backs over the two feet of sailplane wing..."Ug-oh," the squad is immediately activated. "Anybody can be a member," he said. "All you do is come on over to wherever the catastrophe is happening and begin to say, 'Ug-oh' You have to point at things and you have to lift up things, and every once in a while you have to whisper a little bit, 'Ug-oh.'"

He closed by saying, "What I've said here tonight, I truly feel about soaring. I love the sport. I've been in it for 28 years, been all over the world and have had a wonderful time. It's the people that keep me in it, the children especially. I hope to be in it for a long time to come. I'm truly honored to be asked to be in the United States Soaring Hall of Fame. Thank you very much."



Spratt, (second from right) and friends fly model airplanes on a no-soaring contest rain day.



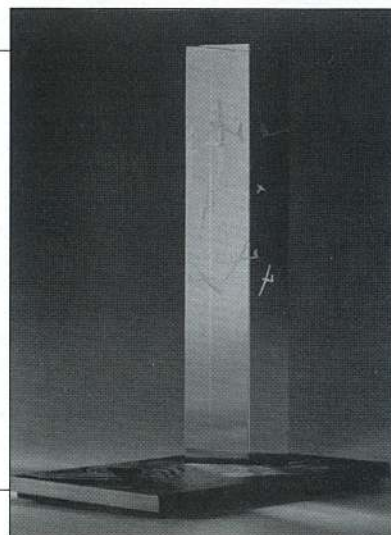
Hall of Fame members welcome Charlie Spratt and Paul Rudy Opitz To The United States Soaring Hall of Fame

Left to right: Howard Burr, Glendale, CA, 1987; Hal M. Lattimore, Ft. Worth, TX, 1989; William Schweizer, Elmira, NY, 1984; Karl H. Striedieck, Port Matilda, PA, 1980; Alcide Santilli, Albuquerque, NM, 1979; Ernest Schweizer, Elmira, NY, 1955; Floyd J. Sweet, McLean, VA, 1963; Theodore E. Sharp, N. Hollywood, CA, 1983; Bernald S. Smith, Fremont, CA, 1984; Paul A. Schweizer, Elmira, NY, 1955; Seated: Charlie Spratt, Charlotte, NC; Paul Rudy Opitz, Stratford, CT; Virginia M. Schweizer, Elmira, NY, 1971.

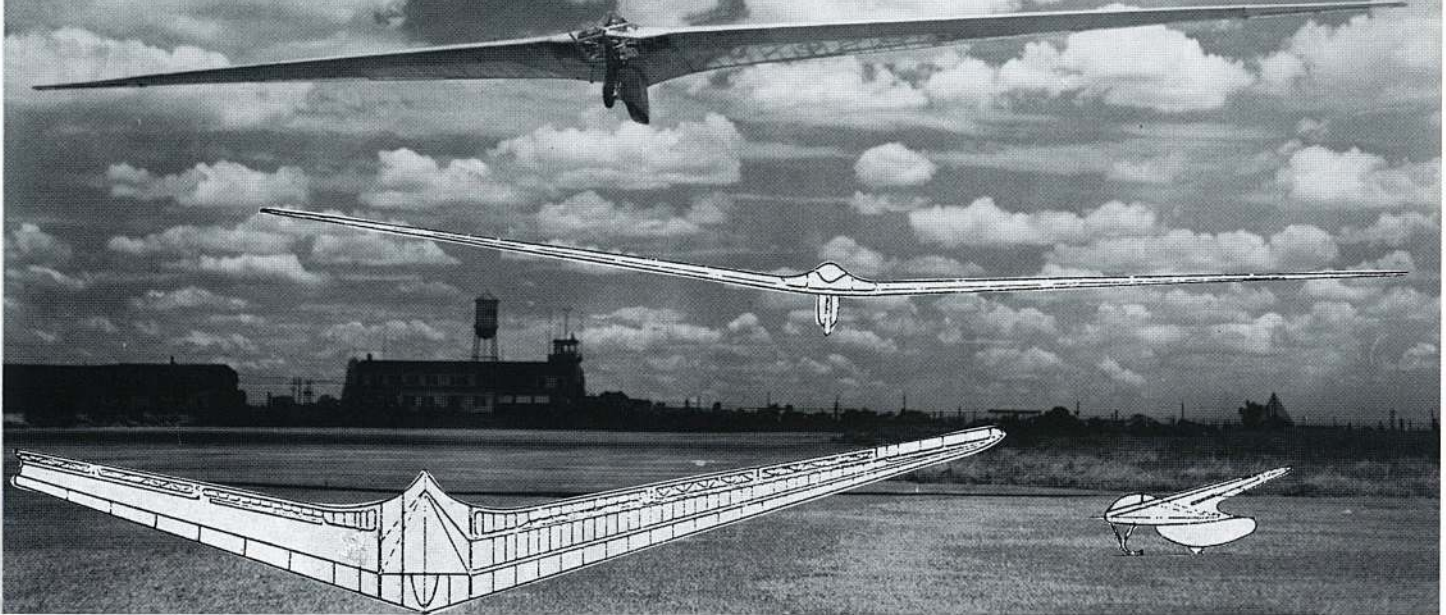
Now on exhibit at the National Soaring Museum **Silent Flight**

a Steuben piece by David Dowler

The aesthetic beauty of glass comes to life as sailplanes thermal over a patterned landscape. To impart the feeling of motorless flight, the design of Dowler's "Silent Flight" is open, airy and perfectly spare. Dowler's glass creations are in the permanent collections of museums worldwide. See "Silent Flight" displayed on the NSM's upper gallery.



N79289, The Horten IVa Flying Wing



N 79289 Horten IVa was the first high performance true flying wing to be flown in the United States. It was the sailplane that 1993 Hall of Fame inductee Rudy Opitz flew to seventh position in the 1952 United States Nationals at Grand Prairie, TX.

The ship's unique history extends 51 years, from its 1943 construction in Neuhausen, near Gottingen, Germany (1) during WWII through a series of survival adventures that would challenge Disney Studios script writers. It survives today, sans ailerons, at The Planes of Fame Air Museum in Chino, CA.

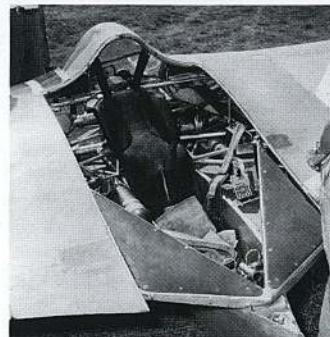
The graceful Ho IV prototype was designed in 1941 by the Horten brothers, Walter and Reimer, pioneers in flying wing design. The brothers built their first flying wing in 1933 and flew it in the 1934 Wasserkuppe competition where it was wrecked. (2)

Their next was the 1935 Horten II, a 16.5-meter ship with an increased angle of wing sweepback. A more stable flyer, the Ho II was supposed to have a glide ratio of 24:1. It was later modified to accommodate a 60-horsepower engine. Having built two more Ho II's in '36 and '37 the brothers flew in the '37 Wasserkuppe contest. They were awarded the 1936 Lilienthal Prize and accumulated enough capital to start on the Ho III.

During the 1939 meets, four Luftwaffe pilots flew Horten III's. While these sailplanes flew very well, they were at a disadvantage in cross country flight because of poor penetration due to light wing loading (weight per square area unit of wing.)

With the Horten IV, the brothers used a much higher aspect ratio (the ratio of the ship's span to the mean chord of the wing), nearly doubling the wing loading, giving this design much longer range potential. The IV's wing root was so much thinner than its predecessors that the pilot was sandwiched in a kneeling/lying position in a mid-wing hump. The pilot's aft-extended feet rested on rudder pedals fitted with stirrups, housed in a narrow trailing edge pod. His torso rested on a cushion with hands and arms over the wing spar to work the controls. His chin rested on a rubber pad to lessen neck fatigue. The pilot's visibility was excellent, with plexiglas panels top, bottom and on either side of the leading edge.

The following description of the Horten IVa is from the Sep-



Above left: Horten IVa cockpit with semi-prone pilot positioning.

Above: Horten IVa sideview.

Left: Horten IVa, head-on view, note pilot visibility.

tember 1979 "Bungee Cord," the newsletter of the Vintage Sailplane Association, and is probably the clearest non-technical explanation of how the ship was constructed and controlled.

"The Ho IV features a plywood-covered steel tube center section containing the cockpit, and fabric-covered wooden wings, except for the outer six feet, which are detachable and made of aluminum. There are no vertical surfaces, except the sides of the well below the center section that accommodates the pilot's knees and provides sufficient depth for the main wheel to keep the wingtips off the ground. Being the center of gravity, the fin-like well provides

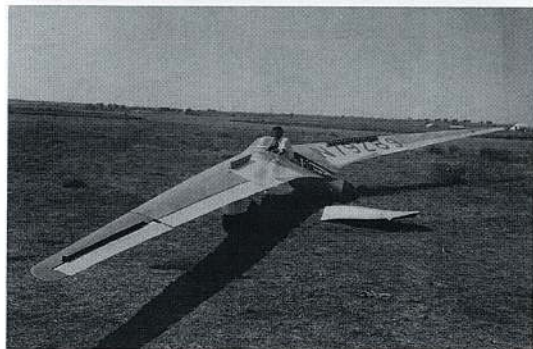
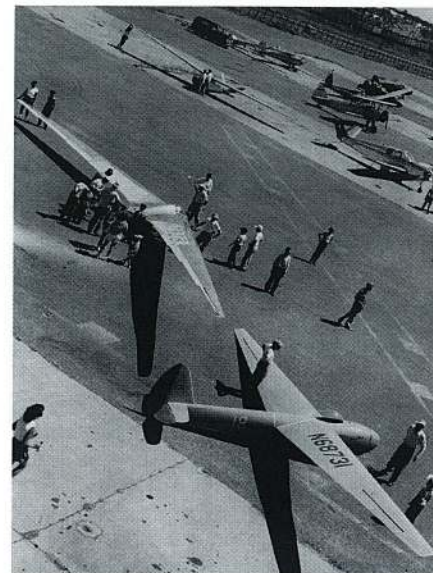
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Top left: DFS test flight of Horten IVa flying against the Darmstadt D-30 indicated the Horten's glide ratio was 34:1.

Left: Opitz and an assistant making adjustment - Note wing control surfaces.

Right: The Horten IVa alongside of "Tiny Mite" at the 1952, 19th Nationals, Grand Prairie, TX.



Continued from Page 10

no directional stability. A long retractable skid with a droppable wheel keeps the aircraft from nosing over on landing.

"The aircraft is controlled by a conventional ramshorn wheel and rudder pedals. Three elevons along each trailing edge provide pitch and roll control. The outboard surfaces are primarily elevators; aileron inputs will raise them but will not lower them. The middle surfaces are capable of large deflections up and very little down, while the inner surface mainly deflects down. This progressive deflection along the wing retains washout and minimizes adverse yaw. (Yaw - rotation of the glider around its vertical axis. Adverse yaw - against the direction of banking and is caused by the difference in drag on the down and up ailerons.)

"The rudder pedals operate small spoilers near the tips, known as drag rudders. These can be operated separately or simultaneously. Large dive brakes are mounted along the main spar near the wing root, and are operated by a handle on the left side of the cockpit."

The late Dr. August (Gus) Raspet reported (3) that "the drag-reducing feature of the Horten IV was the 'Praying Mantis' pilot accommodation. By this configuration the frontal area was reduced...and an extremely low drag coefficient of 0.01 was achieved...A world record for sailplane aerodynamics." (1950)

The DFS (Deutsches Forschungsinstitut für Segelflug) ran a series of tests that indicated the Horten IVa's glide ratio was 34:1 when flying against the Darmstadt D-30. (4)

Dr. Raspet further noted that, "The Horten IV does have better climbing performance in circling flight and above 81 miles per hour it begins to perform better than the D-30...In other words, a better cross-country ship than the D-30." (5)

Following construction of the prototype, three additional Ho IV's were built with metal wingtip sections owing to the weakness of wood at these tapered extremities. Two Horten IV's (LA-AA and LA-AC) survived the wartime maelstrom and wound up in British hands. The former was in bad condition and was turned over to an RAF flying club in Germany. LA-AC was found to be serviceable. It was used for research by the Armstrong-Witworth Company in England. There, it was flown by the renowned German Sailplane trailblazer, Robert Kronfeld.

The ship was then purchased and licensed (BGA 647) by Squadron Leader F. Crocombe. Ownership passed to The Glider Press Ltd., then to an American Captain, Hollis E. Button who bought it for \$2,500. (6)

Button, Valley City, ND, had the Horten IVa certificated but the unique aircraft was severely damaged on his first flight with it.

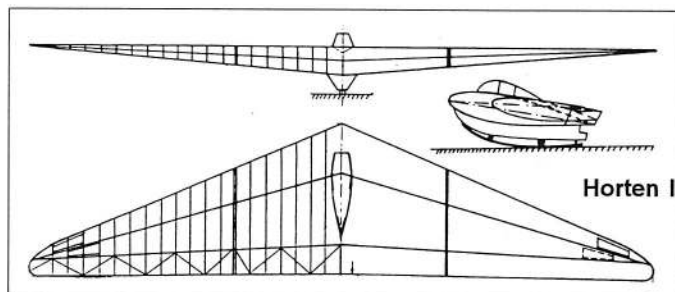
"Until the advent of the Postwar II Fauvel in France and Al Blacktrom's 'Plank,' in this country practically all of the earlier 'wings' were one-shot experimentals," Peter M. Bowers wrote in his 'Interesting Gliders' article appearing in the January-February, 1959, issue of *Soaring*. (7)

At that time, few sailplane enthusiasts in the U.S. had even seen a motorless flying wing, let alone possessed the technical skills to repair it...except one: Paul Rudolph (Rudy) Opitz.

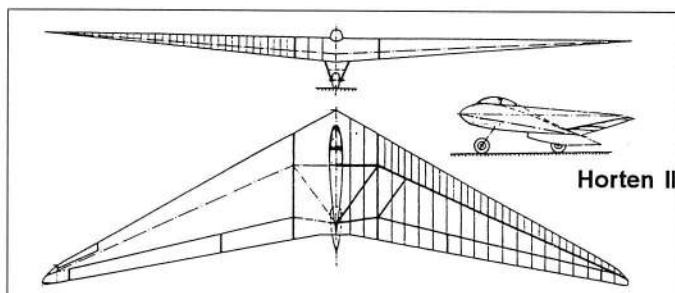
Opitz agreed to repair the Horten IVa in return for one year's use. (See *Hall of Fame Story* in this issue.) Opitz dazzled the soaring community in 1952 with his performances in the "Praying Mantis" at the U.S. Nationals at Grand Prairie.

Following the Grand Prairie outing, the Horten IV was sold to

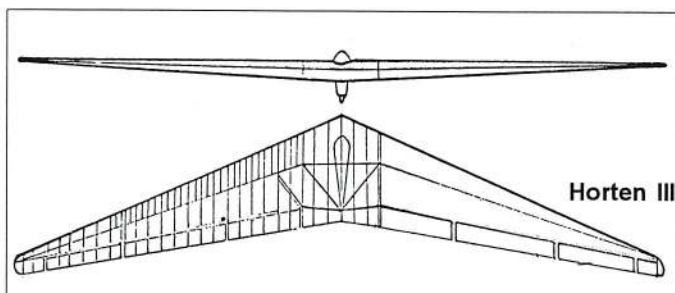
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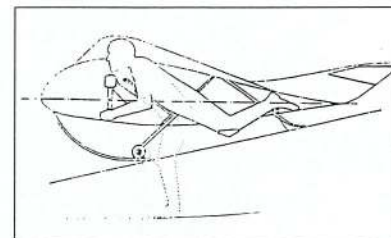
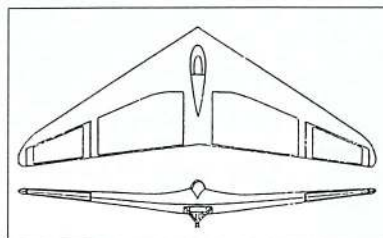
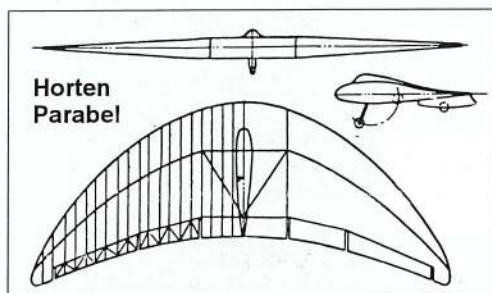
Horten I



Horten II



Horten III



Horten Foot-Launched Flying Wing

Continued from Page 12

Mississippi State University where, under Dr. Raspet's guidance, aerodynamic tests and studies were undertaken to determine the potential of the flying wing.

In 1964 the ship was sold to John Caller, Hollywood, CA, then to Prof. John Groom, Redlands, CA in 1967. According to the **Bungee Cord** article, Groom proposed using the Horten IVa as the centerpiece for the creation of an Alpine Soaring club but died in an accident before the project got started.

The doughty flying wing spent from 1969 to 1975 on its trailer, exposed to the elements on a San Bernadino, CA farm. Ed Maloney, owner of the Chino, CA Planes of Fame Museum found it at the farm and purchased it from the Groom estate for \$500. It is now on exhibit at his museum.

Horten IVa Measurements

Span	65.6 feet	Fuselage Width	
Length (Overall)	12.5 feet	(Overall)	2.4 feet
Height (Overall)	3.6 feet	Fuselage Height	
		(Overall)	2.4 feet

Area in Square Feet

Fuselage Cross-Sectional Area	2.4	Flaps (total)	0
Wing Area (With Aileron)	227	Spoilers (Total)	9.4
Aileron (Total)	34.7	Vertical Stabilizing Area	7.05

Weights, Pounds

Empty	506	Total	770
Pilot	242	Pilot/Empty	0.46
Extra Equipment	22		

Wing

Wing Platform	Tapered	Half Span Chord	4.10 feet
Sweepback	19.3 degrees	Tip Chord	0.98 feet
Dihedral	3.0 degrees	Aspect Ratio	20.9
		Taper Ratio	7.35
Boot Chord	7.21 feet	Load Factor	14

Airfoil Sections

Wing Boot Horten IV, see SOARING Jan-Feb, 1949	Vertical Tail	None
Wing Half Span, Horten IV see SOARING Jan-Feb 1949	Angle of Incidence to Fuselage	0
Wing Tip, Horten IV see SOARING Jan-Feb 1949	Washout	6 degrees
Horizontal Tail	Airplane Tow	To 75 mph
	Aerobatics	No

Performance

Glide Angle (Maximum)	32	Maximum Design Speed	124 mph
Minimum Sink	1.8 fps	Wing Loading (Test Flight)	3.5 psf
Airspeed at Best Glide Angle	45 mph	Span Loading (Test Flight)	0.167 psf
Airspeed at Best Sink	35 mph		

Construction and Materials

Wing - Wooden Structure	Vertical Tail	None
Outer wing all metal	Landing Gear	Retractable
Fuselage	Steel Tube	Skid
Horizontal Tail	None	

Aerodynamics Characteristics

CDmin	0.04	flight measurements of the German sailplane D-30, preprint of paper given Elmira SSA-IAS Technical meeting, 1949.
Efficiency Factor	63.5%	
Source of Flight test data:	Hans Facher, DUL Mitteilungen der FFG, Fulge 6, 1944. English translation: Some results of the	
	From SOARING, Nov-Dec 1980	

For further information on Reimer and Walter Horten and their flying wing designs, see:

Bungee Cord, Newsletter of the Vintage Sailplane Association, Volume V, No. 3, Sept., 1979

The Modified Horten IV of the AHQ-BAFO Club by Bertrand Handwork, Nov.-Dec., SOARING, 1950, pg. 9, 10

The Horten IV, Another sailplane Catalogue Item by Dr. August Raspet, SOARING Nov-Dec, 1950, pg. 8

Interesting Gliders by Peter S. Bowers, SOARING, Jan-Feb, 1959, pg 23

Flying Wing Pilot Position and Design Options, by Dr. Reimer Horten, translated by Jan Scott, SOARING, Aug 1980, pgs 22-25

Lift Distribution On Flying Wing Aircraft, by Dr. Reimer Horten, translated by Jan Scott, SOARING, June 1981, pgs 40-42

NURFLUGEL, Die Geschichte der Horten-Flugzeuge 1933-1960, von Reimer Horten/Peter F. Selinger. H. Weishaupt Verlag Graz

The Horten Flying Wings, The World Vintage Sailplanes, 1908-1945 by Morton Simons, pgs 126-129

The Horten X Foot-Launched Wing - SOARING, June, 1980, pg 24

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- (1) Bungee Cord - Newsletter of the Vintage Sailplane Association, Sept 1979, Vol. 5 No. 3, pg. 7.
- (2) World's Vintage Sailplanes, 1908-1945, by Morton Simons, The Horten Flying Wings, pgs. 126-129.
- (3) SOARING, Nov-Dec., 1950, pg. 8.
- (4) World's Vintage Sailplanes, 1908-1945, by Morton Simons, The Horten Flying Wings, pgs. 126-129.
- (5) SOARING, Nov.-Dec., 1950, pg. 8.
- (6) Bungee Cord - Newsletter of the Vintage Sailplane Association, Sept 1979, Vol. 5 No. 3, pg. 8.
- (7) SOARING, Jan.-Feb., pg 23

Dr. Paul B. MacCready - Flight and Environmental Progress No Boundaries, No Turning Back



MacCready's Orlik under a lenticular cloud over the White Mountains near Bishop, CA. Bob Symons photo - NSM Archives.

Paul B. MacCready lives in a marvelous reality that very few of us ever get to visit. We may come close to MacCready's world during quiet moments when our imaginations soar in wildly creative spheres. But for most of us, those are just stimulating interludes; for MacCready, it's a life style.

He has been called America's most spectacular inventor and Tinker General of the United States. He started in early adolescence, building model airplanes, flapping ornithopters and other innovative aerodynes. In 1942 editors of Model Airplane News said this about the 17 year old MacCready: "This young man is by far the most versatile young flyer ever to come to our attention. Apparently he doesn't go out with the sole objective of winning prizes, but he is also interested in models for the purpose of experiment and developing new ideas. Construction is secondary as long as he can demonstrate a new principle or an efficient way to handle an old one." (1)

Soaring is probably the purest form of flight so it was no surprise that MacCready - the man who later became known as the "father of human-powered flight" with the crossing of the English Channel by his Gossamer Albatross - showed up at the 1946 13th Nationals in Elmira with a surplus Pratt-Read that he flew to 11th place.

MacCready returned for the 1947 Nationals with the "Screamin' Wiener" to take second place and set a world out-and-return record of 230 miles. In December of 1948, with his interest in meteorology, he began exploring the Bishop Wave over California's Owens Valley. There, while investigating wave conditions, he climbed to 29,500 feet in a pre-war Polish Orlik. His canopy cracked and the flight was cut short to avoid risk of exposure at that altitude. (See box)

The Orlik was the same ship in which he won the national championship in 1948 and '49 at Elmira.

MacCready was the single American entry in the 1950, First World Soaring Championship held in Orebro, Sweden. Dr. Paul MacCready, Sr. and Dr. Gus Raspet arrived early to help Paul, Jr. prepare a Swedish-built Weihe which they had rented. He finished second overall thanks to his aggressive flying and the use of his speed-to-fly technique. (2) This method later evolved to the MacCready Speed Ring, a method which succeeding generations of pilots used to determine the most efficient speeds to fly for given convective conditions.

At the 1952 Internationals at Carabanchel, Spain, he finished



Above: 1956 World Soaring Champion Paul MacCready in the Brequet 901, St. Yan, France - NSM Archives.

Right: Dr. Paul MacCready during an informal discussion at the NSM. Staff photo.



sixth, flying a Schweizer 1-23B. That same year he earned a doctorate in aeronautical engineering from CalTech. He won the 1953, 20th Nationals at Elmira and finished fourth in a Schweizer 1-23D at the Camphill, England, 1954 World Soaring Championship.

MacCready's creative thinking was articulated late that year at an Institute of Aeronautical Sciences/Soaring Society of America meeting. He discussed the future contributions of soaring to meteorology, including the use of pressurized sailplanes and the possibility of pilotless sailplanes for high altitude investigations. (3)

MacCready continued his spiral in the soaring arena at the St. Yan, France 1946 World Championships. With his father as crew chief, MacCready managed to rent a French Brequet 901, the ship that they saw perform so well at the Camphill world meet two years earlier. The younger MacCready whisked into thermals, skimmed along snag-toothed ridges and hung in lenticular waves for nine hours until after dark when he landed 259 miles out near the shores of the Mediterranean. The French called him "Le Machine" and he became the first American to win the World Soaring Championship. He later was honored with the prestigious Lillenthal Medal for his victory and for his other contributions to the advancement of motorless flight. (4)

MacCready grazed around several companies in the aero science field but couldn't find any to fit his expansive imagination, so in 1971, he started his own - AeroVironment, in Monrovia, CA. Sort of a Toys-R-Us/CalTech in the real world/Save spaceship Earth organization, it came to general recognition with the "Gossamer Condor."

In 1967 British industrialist Henry Kremer opened his restricted \$100,000 prize to all nationalities for the first "who pedaled or otherwise propelled an aircraft over a one mile figure eight course. Both start and finish line had to be crossed at an altitude of not less than 10 feet." (5)

Most Kremer entrants stressed drag reduction through aerodynamic efficiency resulting in exquisitely streamlined airframes. MacCready disagreed: he reasoned that the key was in the wings. It takes about one and one quarter horsepower to keep a sailplane aloft. But if the weight were kept constant and the wing area tripled, only four tenths of a horsepower would be needed to fly. That's approximately the output of a racing bicyclist. (6)

Along with Dr. Peter Lissaman, MacCready computerized the aerodynamic parameters to obtain the most efficient airfoils for ultra low speed flight. The result was a 96-foot wingspan web of mylar, corrugated cardboard, balsa wood and piano wire, the "Gossamer Condor."

Continued on Page 14

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Then, on Aug. 23, 1977, after months of testing and conditioning, racing cyclist/pilot Bryan Allen wafted off the runway at California's Shafter-Kern Airport in the flimsy "Condor." He huffed and puffed his way around the prescribed circuit, winning the Kremer prize and fluttering into aero history. In 1980, when AeroVironment's sunbeam-powered Gossamer Penguin took to the air, Dr. Paul MacCready became the father of unconventionally powered flight.

Besides developing unique air, land and water vehicles (NSM News, Summer 1994) the techno-thinker/tinkerers at AeroVironment work at solutions to hazardous waste problems, air pollution detection/management and wind and alternate energy forms. Resource conservation and preservation of the environment are high priorities.

What better example than the recently announced "Pathfinder" flying wing? It was designed for low speed, high altitude solar-powered flights of indefinite duration: weeks, months, maybe years. The 100-foot wingspan zephyr has been proposed for use in weather reconnaissance, communication links or military monitoring missions.

What's next? If you're in the vicinity of Monrovia, CA and some of your senses are registering "improbable," probably MacCready

THE POLISH ORLIK NX23727

The gull-wing Orlik II was conceived by Antoni Kocjan and was the Polish entry in the 1940 Helsinki Olympic sailplane design competition. It was exhibited in the Polish Pavilion at the 1939 New York World's Fair.

It had air brakes fitted under the leading edges of the wings, instead of spoilers on the upper wing surfaces. A total of 18 were built.

At the outbreak of WWII, the Orlik SP-1373, was kept in the United States and flown at the 1941 Elmira, NY Nationals as NX 23727. With American entry, it was conscripted into the Army Air Forces' glider pilot training program and designated XTG-7.

Later, it was declared surplus and purchased by Clarence See who restored and refitted it for sailplane competition. Subsequently, it was purchased by Paul B. MacCready and flown to national sailplane championships in 1948 and '49. In December of 1948, MacCready set an unofficial world altitude record by taking the Orlik to 29,500 feet in the Bishop Wave over California's Owens Valley.

In recent years it was owned by John Serafin, Phoenix, AZ and George Kuleza. NX 23727 is the only known Orlik in the Western Hemisphere, and possibly the world.

Specifications:

Span - 50.5 ft.
Area - 162.5 ft.
Aspect Ratio - 14.7
Empty Weight - 352 lbs.
Payload - 209 lbs.
Gross Weight - 561 lbs.
Wing Loading - 3.44 lbs./sq.ft.

Construction:

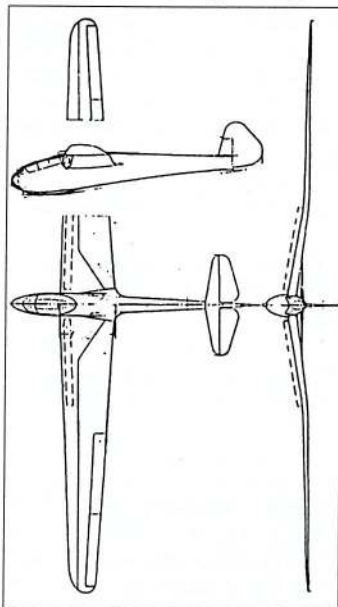
Wood/fabric wing and tail
Wood fuselage

Performance:

L/D max - 26.5 @ 44 mph
Minimum sink - 2.1 ft. per sec.

References:

Soaring Sailplane Directory, November 1983, p.94,
1983 Vintage Sailplane Association, Bungee Cord, Spring '93,
"I Rescued the Orlik" by Clarence See, pgs. 7-10
World's Vintage Sailplanes, 1908-1945, Martin Simons, p. 146



and his AeroVironmentalists are tinkering again with the earth, sun and sky as their workshop. MacCready and his group will center wherever their soaring imaginations take them, no boundaries, no turning back.

- (1) Masterful Tinkering of Genius, David Holzman, Insight, June 25, 1990, pg. 10
- (2) Wings Like Eagles, Paul A. Schweizer, pg. 116
- (3) Wings Like Eagles, Paul A. Schweizer, pg. 146
- (4) Wings Like Eagles, Paul A. Schweizer, pg. 153
- (5) NSM Spring 1993, Vol 15 # 2, pg. 4
- (6) Masterful Tinkering of Genius, David Holzman, Insight, June 25, 1990, pg. 11

From The Director...

We are twenty five years into this endeavor. We are still collecting, preserving, and interpreting motorless flight; that is the National Soaring Museum's mission and public trust. To many of this audience the NSM is a vision fulfilled; these are individuals who carried in their heads, for decades, seemingly fanciful images of a museum so committed.

However, have we not learned that the creation of this institution was the lesser of two tasks; to sustain and endure, to be of consequence and profoundly impact lives is quite another challenge. The initial hurdle could not have been cleared without conscientious dedicated friends, benefactors, trustees, volunteers, and staff. A herculean effort from members of the original cast and from new players is now before us all.

The NSM is at a precipice; it is again time to leap and test the winds. It is no longer enough to accumulate collections; static displays amounting to open storage, dusty and musty archives, and rooms full of "stuff" passed long ago. Today, the words are relevance and accessibility. Tomorrow may bring new words, but we won't get to tomorrow without learning and implementing those of today.

Changes in society, the role of museums, and in the way we learn, dictate that we broaden our audience beyond the aviation and motorless flight communities by utilizing existing museum resources to form innovative and engaging programming. This is where the encampment program, interactive hands-on exhibits, and computer based approaches are requisite. These interpretive ventures must also captivate the soaring community through fresh perspectives on familiar scientific, technological, and historical themes.

Only stability will allow us to accomplish these tasks. Financial security means an endowment of three million dollars or more. Without such an attribute to support the institution, we will be continually plagued by having to generate operating revenues; this means we expend resources simply surviving, as opposed to fulfilling our mission and trust. Within the profession, accreditation by the American Association of Museums will only be achieved with consistent high museum standards of operation. Those AAM precepts incorporate the aforementioned relevance and accessibility regarding educational (interpretational) programming.

The first twenty-five years witnessed the National Soaring Museum being established, struggling to survive, and striving toward the visions held by early motorless flight luminaries. Now it has become our charge to convey the continuum of motorless flight, of science, history, and sport, to this and succeeding generations. In the performance of this duty, we become part of that continuum.



James W. Swinnich
NSM Director



SOARING - THE CATALYST FOR INNOVATION

**The National Soaring Museum's 25th Anniversary
Address at the Third Annual Community Soaring Day
by Dr. Paul B. MacCready**

He had the "class" in the palm of his hand, this mesmerizing teacher. He led his audience through wickets of unconventional thinking: Human-and solar-powered flight, animal-powered flight, a vehicle that would stay aloft indefinitely.

Dr. Paul B. MacCready's address on September 24 at Elmira's Clemens Center for the Performing Arts was the finale of the Third Annual Community Soaring Day and the National Soaring Museum's 25th Anniversary Celebration.

And what a day it was! There was the "Kiteciment" kite fly, the open house and tours of the Museum and the Harris Hill Soaring Corporation facility. There were sailplane rides, an aerogami paper airplane fly-off, and a peek at the Museum's latest project, a full-scale reproduction of the famous 1902 three-axis control Wright Brothers' glider, a barbeque and a chance to meet, talk with, and listen to Dr. MacCready.

It is a given that Dr. Paul B. MacCready and his futurists have a whole panorama of technical and engineering surprises awaiting us if we're careful earth crewmen and don't destroy the environmental first.

What does soaring have to do with all this? Plenty, according to Dr. MacCready. His own experiences, for instance, and the variety of things that soaring has gotten him into. "It's a metaphor for outtakes to the world and gets outrageous, way beyond what people realize," he emphasized.

Soaring and gliding are connected to so many subjects, countries, relationships, technology, neurology, science of all kinds. He added, "Anyone who gets involved in soaring, no matter what his or her background, tends to become a scientist, an engineer and an enthusiast for life in general."

These connections include anything that flies...airplanes, birds, models, Mesozoic Era pterodactyls, bugs, flying fish, even flying squid with their outstretched tentacles, and a tail in the rear...Unbelievable? "But we have pictures," he chuckled.

Very little in nature or the natural sciences seems to escape the incisive imaginations of Dr. MacCready and his fellow practitioners of creativity at his AeroVironmet, Inc. (see accompanying article)

Armed with slides, videos, and almost total recall, the renowned engineering pathfinder took attendees barrelling up and slamming through a thunder cloud on a scientific investigation of the nature of lightning and thunder storms.

A little dizzying? You find yourself almost gasping for breath as MacCready talks about the flight of the human-powered Gossamer Albatross across the English Channel. You're along with the exhausted Bryan Allen pedalling the kite-like contraption toward France. A slight headwind...you've gone 23 miles. If it was high tide and if you had to go 50 meters further, you wouldn't make it! But Allen and the Albatross did make it and won the \$200,000 Kremer Prize.

The Clemens Center crackled with ideas as MacCready detailed his better-known and some lesser-known projects.

For almost two hours he explained the thought processes that fueled his inventions, returning again and again to his main environmental theme - "We must do more with less."

Soaring is closely connected to kites, the aerodynamics of cars, streamlined bikes, any of the composite materials. "The very special essence of soaring has to do with efficiency...doing more with less, something very essential as the world is populated with more humans with more demands."

MacCready noted that in the field of information, computer technology has doubled every year, with no end in sight. If the automobile industry had moved as fast over the last 15 years, a Cadillac would cost one dollar; that's the way numbers work out. "Unfortunately," he laughed, "it would be the size of a walnut."

He illustrated the earth's limits with a graph showing the mass of animal life globally. It represented humans, their livestock and pets covering 97 percent of that mass. Wild animals constitute 3 percent. Ten thousand years ago, man didn't even appear on the chart. "A sobering statistic," MacCready said. "Put this all together, and it tells you that we have to use our brains to figure out how to do more with less."

AeroVironment, Inc. didn't want to be a part of the crowded aerospace industry, so MacCready and his associates directed their talents to energy and the environmental conservation.

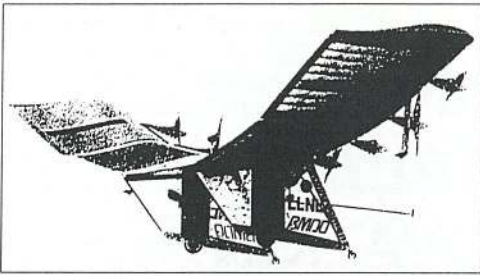
Smiling, MacCready recalled how he became involved in human-powered flight. On vacation in the summer of '76, "while wandering around and daydreaming," he startled himself with the realization that he owed \$100,000 on a note that he had guaranteed for someone who couldn't repay it.

At that time British fiberglass/plastics industrialist Henry

Continued on Page 16



Meeting the NSM Trustees: From left to right, Floyd Sweet, Dr. MacCready, Paul A. Schweizer, NSM Director James Swinnich, NSM President Jan Scott, John Hintz and Nelson van den Blink.



AeroVironment's Solar-Powered "Pathfinder," the poor man's satellite.

Continued from Page 15

Kremer, was offering that amount for the first human-powered take-off and flight of one mile around a figure-eight circuit.

Six weeks later, the MacCready group was flying the first version of the Gossamer Condor. He distilled concepts for the type of construction from a visit to the Wright Brothers Kitty Hawk site and from ideas that popped up while talking with sailplane pioneers Ernie, Paul and Bill Schweizer. "It crashed often but was very quick to repair, modify and do flight tests with," he said.

After computer analysis and field modifications, they came up with the final version. On August 23, 1977, the Gossamer Condor won the \$100,000 Kremer Prize.

He skipped his audience down the yellow brick road of imagination, describing some of his wondrous machines along the way. One highlight: The manned, Solar Challenger - 1600 solar cells whirling an electric driven prop, flew 165 miles - Paris to England.

Its designer labeled the widely publicized model Pterodactyl, "an 18-foot half-scale, temperamental, overweight, adolescent-sized creature." Paleontologists tell us this giant had a wingspan of 36 feet and flew 70 million years ago. The model had a computer auto-pilot brain that ran 13 muscles. It flapped the wings for propulsion, twisted the wings forward and back for pitch stability and moved its head left and right and fingers up and down for drag. It had no tail and keeping it stable "was like shooting an arrow with the feathered end forward," the builder said. He added, "It did fly, though it crashed often, but never when the IMAX cameras were on it; a real ham."

MacCready said the evolutionary selection in nature is for efficiency in the case of the albatross and many other birds. The analog in technology is the sailplane. Its progression provides the push for scientists and engineers to keep making it even more efficient. The other end of the bird spectrum is the peacock, all style and just as good an evolutionary survivor as the albatross. The technological analog is the car, where style is so important. "Neither albatrosses or sailplanes care if they are beautiful because of function," he quipped.

At the far end of the electrical spectrum is the Pathfinder, the so-called eternal airplane that is being tested currently. Pathfinder is a stepping stone to a true airplane that will fly for months at a time on solar power. The eight-prop ship stores enough power to stay at 65,000 feet through the night. "A poor man's satellite," the great inventor said. Telecommunications, meteorological studies and surveillance are just some of its proposed uses.

The audience suspected where MacCready was heading when he flashed a picture of a small hamster-powered car on the screen...and they were right; animal-powered flight!

He enthusiastically reported the start-up of a project with an "amazing" eighth grade class to design and build a hamster-powered aircraft. "It's a disadvantaged school with ordinary kids but with a fabulous teacher, he pointed out... "They're the brightest

kids I've seen," he said, "not because of special gifts but because they're in a fever of excitement and are tying in with the community." He added that they have the senior model builders helping them with construction. These students will be doing animal research that's never been done before.

He said that it was not IQ, not socio-economic circumstances and not money; "It's a good teacher that gets motivated and excites the students and never stops telling them that they can do it," MacCready said.

Next he showed a picture and explained that it was the only impractical vehicle that he'd shown this evening. It was a wind-powered device with a propeller connected by a chain to a wheel. "You set it in it facing downwind. Pretty soon you're going downwind faster than the speed of the wind," MacCready laughed. "It looks like it defies the law of conservation...it doesn't; it does work."

MacCready discussed his General Motors-sponsored 1987 Solar Challenger and its win in the 1987 trans-America race where the tear-shaped car crossed the line 50 percent faster than the second finisher. He said that a shift to ground vehicles from sailplanes was not that much of a leap. They, too, are concerned with aerodynamics, low drag and other similar factors, he said.

MacCready focused on the educational aspects of GM's Sunracer sponsorship. It pushes university students into disciplines in which they have no background. The students must work in teams, beat deadlines, generate money, handle public relations, as in real life. MacCready said that these students are offered much better job opportunities than those without the hands-on competition experience.

With reference to his work with GM's electric Impact auto, he said that the lead-acid battery is the only really practical battery. And that will only give 1 percent as much accountable energy per kilogram as the same weight of gasoline. "It's a 100 to 1 hit," MacCready said. "It forces you to deal with efficiency, which is an attitude that hasn't fit in with cars in the past." He thinks the hybrid car is the much more practical vehicle of the future.

He said that this electric car probably wouldn't have existed for another 10 years if the Gossamer Condor hadn't been built and Henry Kremer hadn't put up his prize. MacCready said it's amazing how some seemingly impractical, odd developments can push the frontiers when there is no need to worry about mass production.

"It makes you focus on other subjects instead," he said.

- ON THE COVER -

An overview of Harris Hill and the National Soaring Museum
-Staff photo/25th year logo by Frank Hurtt

The NSM's full-scale flying reproduction of the historic WRIGHT 1902 GLIDER

Scheduled for completion and display late this year, the NSM's reproduction was researched and constructed by Restorationist Richard Kurzenberger (right) with the help of area Boy and Girl Scout Troops and NSM volunteers. The 1902 glider was the first Wright design with 3 axes control.



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