

VFS Dedicates Focke's Wind Tunnel as Vertical Flight Heritage Site

By Berend van der Wall

On Sept. 15, the Vertical Flight Society held its Vertical Flight Heritage Site Award ceremony at the Focke Wind Tunnel in Bremen, Germany. This was the 12th site recognized since VFS began the program in 2013, which recognizes and helps preserve the most important vertical flight historical sites around the world.

The Focke Wind Tunnel was built by Prof. Dr. Henrich Focke, the famous German aeronautical pioneer and aircraft designer, and was his last research laboratory. Construction of the wind tunnel began immediately after his retirement in 1961 and it was finished in 1963. Interestingly, the wind tunnel building had been the workshop of a carpenter who had built the wind tunnel model of the first Focke-Wulf A 16 light transport aircraft in 1923.

Historic Background

Focke became interested in rotating-wing aircraft in 1932. The Focke-Wulf company built 40 Cierva C.30 Autogiros under license in Germany as the Fw 30 Heuschrecke ("Grasshopper"). His Fw 61 was arguably the first practical helicopter in the world. Its maiden flight took place in 1936 at Bremen Airport and later broke all existing world records.

Before VFS started its Vertical Flight Heritage Sites program in 2013, the Society was supporting a program by the American Institute of Aeronautics and Astronautics (AIAA). VFS members successfully nominated several helicopter and VTOL sites for their program, including Bremen Airport, recognized in 2011 for its historical significance in aviation. The airport was the center of a century of aeronautical achievements, having been founded in 1913, and the AIAA plaque recognized the success of the Focke Fw 61. Its successor, the Fa 223, was the most powerful helicopter in the world for many years and was further developed in France after World War II.

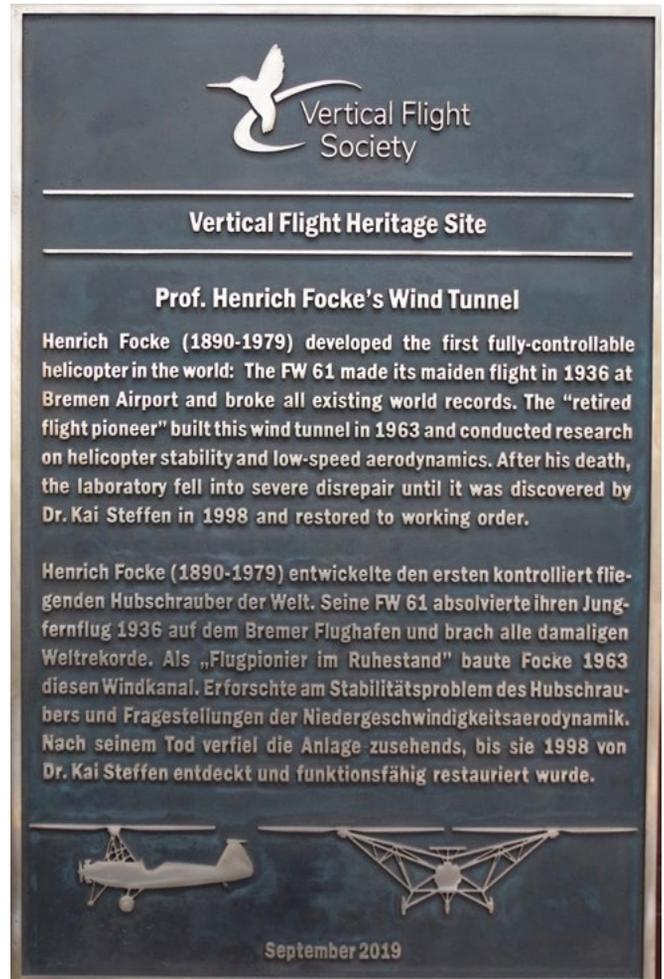
Focke went on to build different vertical takeoff and landing (VTOL) aircraft in France that formed the basis of the very successful Alouette family of helicopters, in the Netherlands, in Brazil on the Beija-Flôr (Portuguese for "Hummingbird") helicopter, and in Germany, working for the Borgward automotive company on his final design, the Kolibri (German for "Hummingbird").

During his retirement years, Focke spent nearly every day conducting practical experiments in the wind tunnel, clarifying some of the many then-unanswered aerodynamic questions, and in the pursuit of new knowledge. He was particularly interested in maximizing flight safety through aerodynamic advances and improved flight stability.

His work continued until 1975 when, at the age of 85, declining health forced him to cut back, though he was able to publish his autobiography in 1977. Focke died in 1979, and the wind tunnel was abandoned and left to decay. The Focke family did not have the money to maintain or repair the building, and as time went by,



Steffen (right) and van der Wall (left) unveil the VFS plaque at the Focke Wind Tunnel. (Photos courtesy of the author)



the roof developed leaks and the rainwater came in.

The site was forgotten until it found new attention (due to the aforementioned autobiography in 1998 by the current curator, Kai Steffen, a PhD candidate at the time. For the next two years, two small work groups tackled the reconstruction of the wind tunnel, but progress was hindered by the lack of funds. Through news stories in local newspapers and the aviation press, inviting television news teams to see the wind tunnel and giving presentations, a charitable foundation was set up to repair and sustain the wind tunnel and laboratory. Simultaneously, the foundation wrote to companies, public authorities and other foundations asking for support. This effort quickly brought success and resulted in donations of about \$250,000 from various charity organizations to restore the building. Work began in late 2003 and, with its completion, the research laboratory was opened to the public on Feb. 25, 2005, as a heritage site. Today, Henrich Focke's historic wind tunnel again is available for use as a modern low-speed aerodynamic research laboratory, especially for students.

Dedication Ceremony

The Focke Wind Tunnel was successfully nominated by the author, supported by the VFS History Committee. The site was feted at the 75th Annual Forum Grand Awards Dinner in Philadelphia on May 15.

The dedication ceremony was scheduled for Sunday, Sept. 15, in conjunction with travel to the European Rotorcraft Forum (ERF) in Warsaw, Poland. But when VFS Executive Director Mike Hirschberg wasn't able to attend the ceremony due to an airline delay, the author stood in as the official VFS representative, providing the background information on the Heritage Sites program and the proper perspective.

Dr. Kai Steffen, the head of the Focke Wind Tunnel Foundation, told the story of how he found the facility in badly deteriorated condition, finding sponsors and how a group of volunteers, after years-long efforts, was able to get everything into shape again, including finding and using original material from the 1950-60s. The restoration was followed by 10 "happy" years of opening it to the public and making it operational for scholars and students to perform experiments, followed by the last 10 "unhappy" years of struggling with authorities, raising sufficient money and finally becoming part of the German Foundation for Monument Protection. Steffen emphasized that with this VFS award, the site receives more international reputation than it sometimes appears to have in Germany. Therefore, the dedication ceremony was a particularly special day for the Focke Wind Tunnel Foundation.

The unveiling of the VFS Vertical Flight Heritage Site Award bronze plaque was performed jointly by Steffen and the author, and everyone raised a glass of champagne.

The crowd consisted of the members of the Focke Wind Tunnel, the German Aerospace Center (DLR) and former DLR members, such as the author, Bernd Gmelin and Wolfgang Geissler. Rainer Heger from Donauwörth was the designated Airbus Helicopters representative.

Some of those in attendance, like Gmelin and an retired employee of VFW (Vereinigte Flugtechnische Werke, the name of the Focke-Wulf company before becoming Messerschmitt-

Discovering a Hidden Hummingbird's Wing

Some years ago, during maintenance work of the heating system at DLR in Braunschweig, workers found some old wooden rotor blades in a heating-pipe tunnel of the basement of the institute. Thought to be remainders of some Aerospatiale Alouette II tests in the 1970s, these blades were moved elsewhere and forgotten again. A closer look recently revealed they were not Alouette rotor blades, but rather were from Focke's Kolibri helicopter, his last helicopter design. The Kolibri development was conducted for Borgward in Bremen during 1956-1961 but ended due to Borgward's bankruptcy; only two prototypes were built. In comparing the found blades with the only known Kolibri blades at the German Helicopter Museum in Bückeburg—the construction details such as material and blade tip design, and the dimensions, proved this to be true. A look into DLR's archival material revealed that the institute had supported work on Focke's Kolibri, but not what specifically. The painting of the blades indicated that there was a hub-mounted camera for the measurement of blade motion, which was very usual in those times.

In July, the blade was also shown off at the International Helicopter Forum. The banquet was held at the German Helicopter Museum and the blade was unveiled to the dinner participants — which included Sergei Sikorsky, who highlighted the friendship of his father, Igor I. Sikorsky, with Henrich Focke.



Steffen (left) pulls the Kolibri blade from its protective sheath, held by Airbus's Rainer Heger.

Bölkow-Blohm in 1981) told about their personal interactions with Henrich Focke himself, highlighting his character and his relation to employees.

In addition, some of the sponsors of the Wind Tunnel Foundation were represented, including Airbus Bremen. Other visitors came from historical projects, like the Bremen Borgward Automobile



Dr. Steffen demonstrated flow visualization of a model in the Focke Wind Tunnel.

Club, the FW 200 Condor Group, the VFW614 Group and the Hanseatic AVIASPACE organization.

The event was highlighted by the best weather conditions with an abundance of sun.

A Surprise Gift

Following the dedication ceremony, the author, in the name of DLR, officially bestowed a surprise gift: one of the original Borgward-Focke Kolibri helicopter rotor blades, which had been discovered some years ago at the DLR in Braunschweig (see sidebar), forgotten for a long time and found — similar to the Focke wind tunnel.

This was quite a momentous occasion, that a Kolibri helicopter rotor blade from 1958 still existed and now had come back home to the city of Bremen where it had originally been built, and home to the last working place of its inventor, Henrich Focke.

The rest of the afternoon was then filled with a reception and many discussions among the attendees. The wind tunnel was shown off and put into operation to demonstrate flow visualization.

None of the invited politicians appeared, but the local newspaper, the *Weser-Kurier*, included an article that evening that was originally titled, “Honor and Surprise at the Focke Wind Tunnel.”

To learn more about the site, visit www.Focke-Windkanal.de. Please consider supporting the Focke Wind Tunnel Foundation to help preserve the laboratory for the future.

About the Author

Dr. Berend G. van der Wall is Senior Scientist at the German Aerospace Center (DLR), Institute of Flight Systems in Braunschweig, Germany. He has been a VFS member since 1997 and has served on many of its committees, including the Test & Evaluation and History Committees. He was until recently an Associate Editor of the *Journal of the AHS*.

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