

## BRUCE CARMICHAEL (2002) (~1922- 2015)

Bruce Carmichael is known as a “*Master of Low Speed Aerodynamics and an All-Around Good Fellow.*”

He has earned the affectionate cognomen of “Mr. Low Speed Aerodynamics,” having made low Reynolds number fluid flows the object of his life's work. An aviation enthusiast since 1928, he earned his Bachelor of Science degree in Aeronautical Engineering at the University of Michigan in 1944 studying under Prof. Edgar Lesher. He worked for Chance Vought and Goodyear Aircraft as an Applied Aerodynamic Engineer. Later he joined the late Dr. August Raspert's team at Mississippi State College conducting flight research on boundary layer control, continuing that work under Dr. Werner Pfenninger at Northrop. Before retiring from North American Rockwell, he worked on low drag underwater vehicles with Dr. Max Kramer.



His 43-year career has been split between analytical and experimental work in both hydro- and aerodynamics. It included test programs in low-turbulence wind tunnels, in flight, in water tunnels, water basins, deep lakes and the ocean. The emphasis throughout was on laminar flow, both natural and suction-stabilized, and on the aerodynamics of the critical Reynolds Number regime.



**SHA Photo**

Bruce Carmichael has lectured at Cal Tech, USC and MIT. He has been featured speaker at National Soaring Conventions, Experimental Aircraft Association conventions and Sailplane Homebuilders Association (now the Experimental Sailplane Association) workshops. His work has been published in the IAS Journal, various NASA Contractor Reports, Northrop and Rockwell reports, *Soaring* magazine, *Technical Soaring*, O.S.T.I.V. Publications, *Sailplane Builder*, National Free Flight Symposium journals, *Sport Aviation*, *Kitplanes*, *Contact* magazine and the French magazine *Experimental*. He describes himself as a “ham-handed model airplane builder and sailplane pilot.”

**Above is the biography submitted to OSTIV by Al Bowers, et al.**

Bruce Carmichael gave the Barnaby Lecture in 2000 and was awarded the OSTIV Plaque with Klemperer Award in 2014. He was the owner of a Schweizer SGS 1-26A and holds "C" Badge #1074.

The citation with the OSTIV Plaque with Klemperer Award reads as follows:

Dedicated to: Bruce H. Carmichael

For his many significant contributions to soaring technology in laminar flow research, scholarly papers, popular articles, books and seminars in recent years.

He has made information on laminar flow research, design and practical operation from more than forty years of industry and personal experience available to a wide audience through his many scholarly papers, popular magazine articles and books on ultralight gliders, sailplanes, motorgliders and personal aircraft drag reduction. In addition, he has planned, organized and conducted dozens of seminars and conferences on soaring technology which have introduced many interested people to the science and culture of soaring. He has inspired and motivated several generations of soaring enthusiasts.

Presented on occasion of the 2014 Soaring Society of  
America National Convention and OSTIV RNO14  
Conference, March, 2014, Reno, Nevada, United States of  
America

The OSTIV Plaque with Klemperer Award honors a person for the most noteworthy scientific and/or technical contribution to soaring flight in recent years.

At his retirement party, Bruce paraphrased the lines of a 1960 folksong, "Clouds":

*I've looked at flow from both sides now.  
It's mostly turbulent, but still somehow,  
It's the laminar cases that I recall and,  
The quest for them has been a ball.*