

Battin Birthday Issue

HERE is a European custom of honoring an outstanding person on a significant birthday or on his retirement with a volume of original contributions. We continue that tradition by publishing this celebratory issue in honor of Dr. Richard H. Battin on the occasion of his 80th birthday this March. The papers selected for this issue all relate to guidance, navigation, or control, representing areas of his pioneering research and teaching during his professional career spanning the past six decades. Many of the papers do explicitly reference one or more of Dr. Battin's contributions. For example, the paper by Weiss uses adjoint systems, which is a technique introduced to control engineers in one of Battin's earliest papers, "An Application of Analog Computers to the Statistical Analysis of Time-Variable Networks" (with J. H. Laning Jr.), *IRE Transactions on Control Theory*, 1955. Other examples of the magnitude of Battin's influence appear throughout these papers in the references cited. It is with gratitude for his knowledge and wisdom, as well as his ability to teach and inspire others to maximize their total potential, that we dedicate this issue to him.

Many of his awards and accomplishments are listed in his biographical sketch that follows. This bio doesn't speak directly, though, of his dedication to excellence, to the respect he has earned from his colleagues, or to the gratitude of his students, many of whom have gone on to great successes—including three of them who walked on the moon. I can personally attest to all of these, having known him since 1964 when I was his teaching assistant and then, later, when I worked with him as a colleague at MIT and at Draper Laboratory. Dick is a very approachable person who is always there when you need him. Whether he is attending a student's thesis defense, writing a reference, or giving a talk, he gives his time willingly in support of others. In 1978, he was one of the original Associate Editors of this journal, and he continues to contribute as an author and reviewer. He has helped the *JGCD* become the leading technical publication in its field. Thank you, Dick, for all of your contributions to this journal, the aerospace profession, and mankind.

George T. Schmidt
Editor-in-Chief

Biographical Sketch



Richard H. Battin

Richard H. Battin received an S.B. degree in electrical engineering in 1945 and a Ph.D. in applied mathematics in 1951—both from MIT. He received an Honorary Doctor of Science Degree in 1999 from Texas A&M University. From 1951 to 1956, he was an assistant director of the MIT Instrumentation Laboratory. From 1956 to 1958, he was a senior staff member at Arthur D. Little, Inc. He returned to the Instrumentation Laboratory in 1958 and subsequently served as technical director, Apollo Mission Development, and laboratory associate director. In 1973, the Instrumentation Laboratory separated from MIT and was renamed the Charles Stark Draper Laboratory, Inc., and he became associate head, NASA Programs Department. He retired in 1987 from the Draper Laboratory but continued his MIT teaching activities, which started in the fall of 1946. Currently, he is a senior lecturer in the Department of Aeronautics and Astronautics at MIT.

In 1972, he and David G. Hoag were presented the AIAA Louis W. Hill Space Transportation Award (now called the Goddard Astronautics Award) "for leadership in the hardware and software design of the Apollo spacecraft primary control, guidance, and navigation system which first demonstrated the feasibility of onboard space navigation during the historic flight of Apollo 8." In 1978, he received the AIAA Mechanics and Control of Flight Award "for invaluable contributions to the on-board navigation and guidance for the Apollo missions." In 1987, he received the AIAA Pendray Aerospace Literature Award "for sustained and outstanding contributions to literature in astrodynamics, control, and applied mathematics

which have led to significant advances in strategic missile and planetary navigation systems." He received the AIAA von Kármán Lectureship in Astronautics for 1989. He was presented the 1996 Dirk Brouwer Award by the American Astronautical Society and the inaugural 2000 Tycho Brahe Award by the Institute of Navigation. He also received the 2002 AIAA Aerospace Guidance, Navigation, and Control Award "for contributions to the theory and practice of astrodynamics which guided our astronauts to the moon, and for articulating these concepts to a multitude of students." He received the 2002 AIAA Summerfield Book Award for the AIAA Education Series book *An Introduction to the Mathematics and Methods of Astrodynamics*, "an excellent source for both classical results and recent research, much of it generated by the author." He is also the coauthor (with J. H. Laning Jr.) of *Random Processes in Automatic Control*, published by McGraw–Hill in 1956, and the author of *Astronautical Guidance*, published by McGraw–Hill in 1964. He is an Honorary Fellow of the AIAA and a Fellow of the American Astronautical Society. He is a member of the National Academy of Engineering and the International Academy of Astronautics. "In recognition of outstanding teaching," the students of the MIT Department of Aeronautics and Astronautics honored him in 1981 with their first Teaching Award.