

**Mr. Karel J. "Charlie" Bossart
Inducted 1998**



Mr. Karel J. "Charlie" Bossart was involved in the early development of rocket technology with Convair Corporation and is known as the "father of Atlas' "Mr. Bossart was largely responsible for conceiving in 1946 the design of the propellant tanks, which served as the primary structure for the Atlas launch vehicle. The tanks were a unique design consisting of pressure-stabilized, thin steel, a monocoque structure with a common inter-tank bulkhead-a "steel balloon." One writer described Bossart's design "one of those brilliant, innovative, and yet simple ideas, that have withstood the test of time as a major contribution to the advancement of astronautics."

Born in 1904 and a native of Belgium, Mr. Bossart graduated from the University of Brussels in 1925 with a degree in mining engineering. He won a scholarship to the Massachusetts Institute of Technology from the Belgian-American Education Foundation. At MIT he studied aeronautics, specializing in structures. He remained in America working on several airplane projects. By 1945 he was Chief of Structures at Consolidated-Vultee Aircraft in California (Convair, later General Dynamics). As Chief of Structures, he worked on a proposal for Project MX-774, the first U.S. study of the V-2 and long-range missiles. Intrigued by the potential for such vehicles to do things airplanes could not, he was challenged by the skepticism about their feasibility. Mr. Bossart emerged as the driving force who successfully transformed the MX-774 from a study to a vehicle test program. When the Air Force requested that Convair develop a rocket with an 8200-kilometer range, Mr. Bossart was placed in charge of development.

The Air Force agreed to the construction of ten MX-774 vehicles, with three different developmental stages. Stage A, the Teetotaler, was a sub-sonic, self-navigational jet plane. Old Fashioned, Stage B, was a test missile to try out the design work for the final stage. Stage C, the Manhattan, was to be the end result-a rocket with a range of 8200 kilometers. The MX-774 was cancelled in 1947 due to budget restrictions. Bossart,

however, convinced the Air Force to fund the completion of the three vehicles allowing Convair Corporation to launch three MX-7745s with less than satisfactory results. The tests, which concluded in December 1948, however, successfully demonstrated several design concepts including Bossart's pressurized, monocoque tanks.

In 1949, in response to the Soviet Union's detonation of its first atomic bomb, interest in the MX-774 project was rekindled. Bossart again led efforts to revive the program in 1951 as the Project MX-1593. Because of its familiarity with the MX-774, Convair was awarded the contract. Karel Bossart again headed the team who renamed the system "Atlas; in honor of the mythological being who bore the weight of the world on his shoulders. In addition to the integral, pressurized, monocoque tanks, Mr. Bossart is credited with conceiving gimbaling of entire rocket engines. He also experimented with various means of separating the nose-cone warhead as a solution to the reentry problem. All of these experiments would prove important in designing the Atlas. The Atlas finally went into production in 1955 and has remained as one of the most weight efficient designs ever developed.

A member of his team at Convair described Bossart as "a one-man System Requirements and Functional Analysis Group ... and much more effective." He could quickly understand all the requirements of a subsystem and then conceptualize a design that would perform all the critical functions most efficiently" He recognized that for the Atlas liquid propellant tanks to be efficient they had to serve as both the primary vehicle structures as well as the propellant containers.

Karel Bossart retired from General Dynamics in 1967. He died in 1975. Among the awards he received which recognized his contributions to engineering and the Atlas program were the U.S. Exceptional Civilian Service Award in 1958 and the 1959 Collier Trophy for the U.S. Air Force and General Dynamics. Mr. Bossart died on 3 August 1975.