



Clarence I. Johnson

Clarence L. "Kelly" Johnson

1910-1990

By Daniel M. Tellep

CLARENCE L. "KELLY" JOHNSON, acknowledged throughout most of the world to have been the best aircraft designer in the history of aviation, died on December 21, 1990, at the age of eighty.

Elected to the National Academy of Engineering in April 1965, Kelly contributed to the design of more than forty Lockheed aircraft—including the P-80, which was the United States' first operational jet fighter, and the world's fastest, highest-flying aircraft, the renowned SR-71 Blackbird. He also was acclaimed for his unique leadership qualities and his distinctive management style and philosophy.

Kelly Johnson was born in Ishpeming, Michigan, on February 27, 1910. He later moved to Flint, graduated from Flint Junior College, and completed his education at the University of Michigan, where he received his bachelor of science degree in 1932 and his master of science degree in aeronautical engineering in 1933.

The seventh of nine children, Kelly said in later years that he learned respect for hard work and for education from his Swedish immigrant parents. From his father, a bricklayer and carpenter, he acquired a love of tools and the knowledge of how to use them. By the age of twelve he knew he wanted to build airplanes.

After joining Lockheed as a tool designer in 1933, Kelly had assignments as flight test engineer, stress analyst, aerodynamist

cist, weight engineer, and wind tunnel engineer before becoming chief research engineer in 1938. He founded Lockheed's Advanced Development Projects organization—more widely known as the "Skunk Works"—in 1943. Subsequently, while retaining leadership of the Skunk Works, Kelly became chief engineer in 1953 and was appointed corporate vice-president for research and development in 1956. He retired in 1975 as a senior vice-president of Lockheed Corporation, but remained a senior adviser until his death.

This prolific genius has been widely recognized. He was the first two-time recipient of both the Robert J. Collier Trophy, presented by the National Aeronautic Association of the U.S.A., and the Theodore von Karman Award of the Air Force Association. Kelly also received two Sylvanus Albert Reed Aeronautics Awards, given by the American Institute of Aeronautics and Astronautics; the National Aeronautic Association's Wright Brothers Memorial Trophy; and, in 1971, the Founders Medal of the National Academy of Engineering—all among the most prestigious awards in engineering and aviation.

He was elected to the Aviation Hall of Fame in 1974, the Michigan Hall of Fame in 1988, and the National Management Association Hall of Fame in 1991. He received four presidential citations, including the Medal of Freedom—the highest civil honor the president can bestow.

Kelly was an honorary fellow of the American Institute of Aeronautics and Astronautics and a fellow of the Royal Aeronautical Society. In addition to the National Academy of Engineering, he was a member of the National Academy of Sciences, the Society of Automotive Engineers, and the Tau Beta Pi and Sigma Xi engineering fraternities. He received honorary doctorates from the University of Michigan, the University of Southern California, and the University of California at Los Angeles.

He authored or coauthored numerous articles and technical papers on aircraft design and production. His autobiography, *Kelly: More Than My Share of It All*, written with Maggie Smith, was published in 1985.

Under Kelly's leadership, Lockheed's Skunk Works built America's first operational jet fighter, the P-80 Shooting Star.

Lockheed's F-104 Starfighter was the first operational jet to fly at twice the speed of sound. Its U-2 first flew more than thirty years ago but is still the highest-flying single-engine aircraft in the world. The incomparable Mach-3 SR-71 Blackbird holds world records for speed and altitude that have yet to be eclipsed a quarter-century after it was built.

Those aircraft were all produced under budget and on time, using an absolute minimum number of people working in an atmosphere of exceptional innovation. Under Kelly's direction and management, the name Skunk Works became synonymous with a unique management style that encourages creativity, responsibility, accountability, and trust. He devised and enforced fourteen basic management rules that have been widely cited in publications such as *A Passion for Excellence*. Kelly supplemented his formal operating principles with memorable axioms such as "if you can't do it with brainpower, you can't do it with manpower or overtime" and "be quick, be quiet, be on time."

The Skunk Works, under Kelly's leadership, was known for continuously advancing the state of the art in engineering and aviation. Typical of the group's achievements was its pioneering use of titanium in aircraft skins and structures, an effort recognized by the American Society of Metals in 1970 with its first annual Engineering Materials Achievement Award.

In summation, perhaps President Lyndon B. Johnson put it best as he was awarding Kelly his second Collier Trophy for the Blackbird series of aircraft: "Kelly Johnson and the products of his famous Skunk Works epitomize the highest and finest goal of our society, the goal of excellence. His record of design achievement in aviation is both incomparable and virtually incredible. Any one of his many airplane designs would have honored any individual's career."