



Ben R. Rich

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1925-1995

By Willis M. Hawkins

Ben Rich died on January 5, 1995, after a full career as an engineer, a designer, and an effective and cherished executive. I first knew Ben when he joined the Lockheed Aircraft Company in Burbank back in 1950. He came to us from the University of California, Berkeley, and University of California, Los Angeles, with a master's degree in mechanical engineering. At the time, I was in charge of the Advanced Design Organization under the Deputy Chief Engineer C. L. "Kelly" Johnson, and we were working on our first Mach 2+ Air Force fighter proposal, which became the F-104. Ben was assigned the task of analyzing the aerothermodynamic performance of the power plant with little or no existing state of the art for supersonic inlets. It is a testament to Ben's understanding of this specialty that the inlet configuration was classified by the Air Force and the details obscured in Air Force-released pictures of the airplane for a number of years.

The Lockheed "Skunk Works," which had originated during the design and development of the original P-80 prototype "Lulu-Belle," was being reactivated at about the time that the F-104 was conceived. Its specific purpose was the secret development of the U-2, and Ben was "borrowed" by Kelly Johnson to help on that program. His "temporary" assignment became his career. Under Kelly, Ben pursued his specialty of aerothermodynamic analysis. After the U-2, he

was called upon to produce power plant design concepts for a supersonic airplane having the same missions as the U-2 since it was clear that the U-2, in spite of its remarkable high-altitude performance, would soon be vulnerable to opposing air defense systems. Still unknown to most of the technical world was Ben's leadership in designing a Mach 2.0 airplane with the same radius of action as the U-2. It appeared at the time (before air-to-air refueling) that the only way to accomplish such a mission was by using hydrogen as a fuel. Ben created and directed the development of the power plant system and demonstrated its feasibility by means of full-scale operational test rigs. This system incorporated cryogenic tanks, practical insulation, fuel pumps and valves, refueling hardware, and power plant operation years before such equipment would become available in national space programs. Since the planned use of the airplane involved secret bases in remote areas worldwide, the logistical problems of supplying liquid hydrogen at such bases drove the systems cost to insupportable heights and the program died.

Ben and Kelly both realized that high performance was essential for accomplishing the reconnaissance mission, and out of the remains of this unfulfilled program, including the Pratt and Whitney engine work, came the beginnings of the SR-71 Blackbird incorporating a power plant concept still unequaled in performance nearly thirty years after it was conceived. At this point in Ben's development, his influence on new airplane designs was substantially expanded to include the aircraft materials, the fuels, the environmental protection of the crew, and the creation of the myriad systems that had to work at the elevated temperatures accompanying Mach 3.0+ flight. Although management hierarchy was nonexistent in the Skunk Works, it was clear that Ben, more and more, was being depended on by Kelly for ideas and concepts and for the day-to-day technical decisions necessary to produce the unique classified high-performance aircraft being demanded.

Addressing aircraft vulnerability to sophisticated air defense systems led to unusual concepts depending on characteristics other than speed and altitude to achieve invulnerability. Ben

participated in early efforts to reduce the radar signature of the airframe and its power plants. Even U-2 modifications were attempted, and the unique shape and materials used in the SR-71 attest to early "stealth" efforts, all of which ultimately produced the exceptional configuration exemplified by the F-117A and the concept confirmation vehicles that preceded it.

The constant infusion of new technologies into aircraft design concepts demanded of Ben, now clearly a deputy to Kelly Johnson, a technical judgment role that was unprecedented. Kelly and a majority of the Air Force leadership were comfortable in their dependence on speed as the dominant factor in superior tactical effectiveness, and stealth, as a concept, appeared to many to be a retrograde step. Ben's persistence, technical and operational logic, articulate support, and patient salesmanship finally brought true, effective stealth into operational thinking, and the F-117A came into being. The F-117A earned the 1989 Robert J. Collier Trophy for Rich and the Air Force Lockheed Team. In addition, as a result of all his accomplishments as well as the F-117A, Secretary of Defense Harold Brown awarded Ben the Pentagon's highest civilian defense award—the Medal for Distinguished Public Service.

With Kelly's retirement and increasing health problems, Ben became the leader of Lockheed's unique Skunk Works organization, the chief Skunk. I was intimately involved in this transition since the Skunk Works had always been a part of the Lockheed California Company, and my own assignment at the time was as president of this company—Ben's boss. Watching Ben work with the creative engineers, the production artists, the ingenious test teams—all of whom had grown up in this remarkably spontaneous and individualistic environment—was a rewarding experience. Kelly, his mentor, and a giant by any standards, was not an easy man to work with. He was intolerant of average performance and intellect, and he was a technical one-man show. Ben was the antithesis of this. He delegated completely, he was open to suggestion—almost to a fault—and he was quick with praise for any, even small, contribution. He was also an enthusiastic salesman who relished the accomplishments of those around him.

Ben's peers recognized his accomplishments. In 1972 the American Institute of Aeronautics and Astronautics, Inc. (AIAA) honored him with its National Aircraft Design Award, and in 1991 he was made an honorary fellow. In 1988 he was the invited Wright Brothers Lecturer in Aeronautics by the AIAA and Royal Aeronautical Society. In 1981 he was elected to the National Academy of Engineering. His unique management approach earned him Silver Knight and Golden Knight awards from the American Management Association.

Lockheed and the nation will miss Ben—a technically sound, enthusiastic leader—proud of what his troops accomplished and effective in selling what these same troops could do. The nation must not lose the wonder and the appreciation of the power of new ideas that constantly motivated Ben.

