

‘Build them rugged’

Designer Ed Heinemann’s vision led to the development of many combat jets

By Tim Sele

He was a self-taught engineer who joined Douglas Aircraft in 1926 as a draftsman. But Ed Heinemann developed into one of the world’s best known and most respected combat aircraft designers.

“Be practical,” he would say. “Build them rugged. Keep things simple.”

Heinemann’s commitment to that vision left Boeing and its heritage companies a lasting legacy of accomplishments—and groundbreaking airplanes such as the SDB Dauntless, backbone of the U.S. World War II carrier-based bombing fleet; the D-558-2 Skyrocket, the first airplane to reach Mach 2; and the F4D Skyray—an achievement that earned him the 1953 Collier Trophy.

During his early career at Douglas, Heinemann developed mentor-type relations with Donald Douglas, James “Dutch” Kindelberger, Jack Northrop and others that lasted many years and helped shape Heinemann’s vision.

The development of two airplanes in particular, the A-3D Sky Warrior and the A-4D Skyhawk, reflect Heinemann’s commitment to simplicity, ruggedness and practicality.

In 1947, the U.S. Navy issued a request for a carrier-based attack bomber with a gross weight not to exceed 100,000 pounds (45,360 kilograms). Curtiss proposed an airplane close to 100,000 pounds while North American dropped out, believing the requirements could not be met at the requested weight. Heinemann and his Douglas team proposed an airplane at 68,000 pounds (30,840 kilograms), just light enough to operate on the Midway-class carriers of the day.

After studying the A-3D drawings, the Navy reset the requirements. Douglas won the contract.

By the early 1950s, Heinemann had become concerned about the growth in size, weight and cost of contemporary combat airplanes. On his initiative, Douglas funded a study for a light combat airplane. The Navy was interested, but it already was committed to a fighter and asked him to adapt the design to a carrier attack aircraft. Heinemann was back in front of the Navy within two weeks with a preliminary design for a plane weighing 14,600 pounds (6,620 kilograms), less than half the weight requirement initially set by the Navy.

The proposed Douglas design would allow for a fighter 20 percent faster with 30 percent more range than the requirements.

Intrigued but skeptical, the Navy contracted for only two prototypes. The result was production of more than 2,900 A-4D Skyhawks from 1954 through 1979.

In 1978, Heinemann was awarded the Guggenheim Medal—established in 1929 to honor notable achievements in aeronautics. The citation issued with Heinemann’s Guggenheim Award was for “outstanding achievement in the innovative design of military airplanes which are noted for longevity of service, versatility of tasks, simplicity of design, high performance and elegance of line.”

Others from Boeing and its heritage companies who have won the Guggenheim Award include Bill Boeing, Donald Douglas, James Kindelberger and Joe Sutter. In 2010, it was Bob Liebeck, a Senior Technical Fellow and program manager with Boeing Research & Technology, who was cited for his work on the company’s Blended Wing Body aircraft concept.

Ed Heinemann was inducted into the Aviation Hall of Fame in 1981, and in 1983 he received the National Medal of Science from President Ronald Reagan. ■

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PHOTOS: The A-4 Skyhawk provided the U.S. Navy and Marines, as well as a number of allied nations, with a highly maneuverable and powerful attack bomber. Between 1974 and 1986, the Skyhawk also was flown by the U.S. Navy Blue Angels flight demonstration team. It was replaced with Boeing’s F/A-18 Hornet. **BOEING ARCHIVES**

(Inset) Ed Heinemann on the Douglas flight line with his A-4D/A-4 Skyhawk. The attack jet was often referred to as “Heinemann’s Hot Rod.” **BOEING ARCHIVES**