A Winning Engineer

By Walter Musciano

The early years of Naval Aviation were marked by talented men who "invented" the field of aeronautical engineering as they went along. Many were not celebrated for their efforts then, and even fewer are recognized now. But the pioneering designs and new concepts created by engineers like Rex Buren Beisel set the stage for Naval Aviation as we know it today.

Following his graduation from the University of Washington in 1916 as a mechanical engineer at age 23, Rex Beisel took a test to qualify as a lieutenant for the U.S. Army Corps of Engineers. His scores earned him an invitation to join the aeronautical section of the Navy's Bureau of Construction and Repair, which became part of the Bureau of Aeronautics in 1921, forerunner of today's Naval Air Systems Command. Although he had no previous aeronautical experience when he joined the bureau in January 1917, he was in good company; textbooks and data about aircraft design were virtually nonexistent, so Beisel and his associates had to learn by doing.

In September 1918 he was promoted to aeronautical mechanical engineer, working on wing design and conducting research in stress analysis. Beisel also designed seaplane hulls, wing tip floats and pontoons, acquiring knowledge of hydrodynamics as well as aeronautics. In November 1919 he became one of the first certified aeronautical engineers in the United States and a member of the bureau's scientific section.

By March 1921, Rex Beisel's innovative designing talent led the bureau to name him project engineer for the Navy's first single-seat fighter specifically designed to fly from a ship, the TS-1.

Beisel's TS-1 design project set the pace for early U.S. naval aircraft. The Naval Aircraft Factory (NAF), Philadelphia, Pa., constructed 5 and the Curtiss Aeroplane and Motor Company received contracts for 34. The versatile biplane could operate with either wheels or dual floats, and operated from the Navy's first carrier, *Langley* (CV 1), and other ships.

Rex Buren Beisel

Beisel's work on the TS-1 was not over, however. He was tasked with helping the NAF convert four TS-1s into racing planes for the 1922 Curtiss Marine Trophy race. One, the TR-1, won the contest. He was also project engineer for a new racer to test a new engine in the Pulitzer Race. Beisel organized a special team of draftsmen, engineers and craftsmen from the Lewis and Vought Corporation and the Wright Aeronautical Corporation to design and build a sesquiplane—a biplane in which one wing was half the area of the other wing—to be designated NW-1. Three shifts working 24 hours a day met the deadline, but during the race the NW-1's engine seized and the plane crashed into a lake.

Glenn Curtiss approached Beisel and requested the 29-year-old designer to prepare Pulitzer Trophy racers for the


TS-1


R2C-1


N2C-1

Through more than 30 years as an aeronautical engineer, Rex Beisel influenced the designs of many of Naval Aviation's hallmark aircraft. Counterclockwise from top: The TS-1 used rigid struts instead of rigging wires, and could be fitted with either wheels or floats. The R2C-1, Beisel's first racing design as a Curtiss engineer, won the 1923 Pulitzer Race and set a speed record. In 1928 the N2C-1 *Fledgling* was selected over 14 other designs to become the Naval Reserve's primary trainer. The F7C-1 *Sea Hawk* fighter was developed expressly for carrier duty. The XF8C-4 led to production F8C/OC *Helldivers* used by both the Navy and Marines. Another "first" was the SB2U-1, the Navy's first monoplane scout-bomber; SB2U *Vindicators* saw combat in early WW II.


F7C-1


XF8C

Navy and the Army. Intrigued by the challenge, Beisel agreed to become the design assistant to the chief engineer of the Curtiss Aeroplane and Motor Company in 1923. His first project was a biplane racer for the Navy. Curtiss biplanes had won Pulitzer races in the past, and Curtiss was preparing one, the CR-3, to race in the international Schneider trophy seaplane race that year. The two new Navy R2C-1s finished first and second in the 1923 Pulitzer Race. The winner, Navy Lieutenant Al Williams, established a world speed record at 243.7 mph, but the record was unofficial as representatives of the Federation Aeronautique Internationale (FAI) were not present to witness the flight. Awakened to the potential of Beisel's R2C-1 racers, the Navy made plans to conduct official speed record trials. With National Aeronautic Association timers present to


SB2U-1

Left, although it could be flown as a landplane, the all-metal Vought OS2U *Kingfisher* was predominantly flown as a seaplane, and was renowned for its WW II sea rescues. Below, the distinctive gull-winged F4U *Corsair* remained in production longer than any U.S. fighter. Below, even as a manager Beisel continued to have a hand in new designs. Shown here as vice president of United Aircraft Corporation (left), he consults with two Vought factory managers in the shadow of an F6U *Pirate* under construction.

represent the FAI, Lt. Williams established a new world speed record of 266.59 mph on 3 November 1923.

Beisel's next racer project was three R3C-1s produced jointly for the Navy and the Army. The Army's sole R3C-1 won the 1925 Pulitzer Race, with Lt. Williams finishing second in one of the Navy's two R3C-1s. Pleased with the success of this aircraft, the services ordered the three R3C-1 racers converted into seaplanes to compete in the 1925 Schneider Trophy Race to be held that October. The Army's R3C-2 won, while the Navy's racers dropped out due to engine trouble. Beisel's successes with the Curtiss racers preceded a promotion to chief designer.

Beisel's reputation as a racing aircraft designer was spotlighted in the 1925 Pulitzer race when the first and second places were captured by R3C-1s. He also designed the *Falcon* two-seat observation aircraft used by both the Navy and Marines, and in 1926 the F7C-1 *Sea Hawk* single-seat Navy fighter, which won the 1929 Curtiss Marine Trophy. In 1928 Beisel's design for a two-bay biplane trainer won a Navy competition, and the Curtiss N2C-1 *Fledgling* became the Naval Reserve's primary trainer. In 1929 Beisel designed one of the first planes specifically for dive-bombing, the F8C-2 *Helldiver.* He also oversaw the design of several Curtiss commercial aircraft for the booming market following Charles Lindbergh's historic flight.

Beisel briefly left Curtiss and military aviation to serve as vice president of engineering for the Spartan Aircraft Company in 1930, where he began designing personal and executive aircraft. This position was short-lived, however, as the depression forced Spartan to stop building aircraft. In 1931 he became assistant chief engineer of the Chance Vought division of United Aircraft Corporation.

At Vought, Beisel continued designing Navy aircraft. In 1932 he designed the two-place XF3U-1 biplane fighter and its follow-on, the SBU-1, the Navy's first scout bomber. In June 1935 he was promoted to chief engineer while working on another first for the Navy, the first monoplane scout bomber, designated the SB2U, later to be the early WW II *Vindicator.* Two years later his knowledge of seaplane float design helped create the first monoplane to regularly catapult from shipboard, the OS2U-1, subsequently known as *Kingfisher.* And in 1938 Beisel and his team submitted a design for what would become perhaps the most recognizable fighter of WW II, the bent-wing F4U *Corsair.* The *Corsair* remained in production longer than any other U.S. fighter up to that time, and distinguished itself as both a fighter and bomber in WW II and Korea.

When he became general manager of Chance Vought in 1943 and later vice president of United Aircraft Corporation in 1946, Beisel was limited to supervisory input into new jet designs, such as the F6U-1 *Pirate* and XF7U-1 *Cutlass,* until his retirement in 1949 after almost 30 years as an aeronautical engineer. He died on 2 February 1982 at the age of 78.

Whether working as an integral member of an engineering team or as the team's leader, creating new aircraft designs or updating previous ones, or supervising fledgling aircraft as an administrator, Rex Buren Beisel had a hand in the design of many ground-breaking—and record-breaking—aircraft. He is representative of the early aeronautical engineers whose dedication to constantly improving the state of the art formed a solid foundation for present-day Naval Aviation.

Mr. Musciano is a prolific author on aviation and other naval subjects, with 21 books and hundreds of magazine articles to his credit over the last 50 years.