

When the Hercules took to the air

The H-4 Hercules, the world's largest airplane, skims across the water at Long Beach Harbor in California. Sixty years ago this month the airplane made its first and only flight.



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World's biggest-ever airplane conducted its only flight 60 years ago

By ERIC SIMONSEN

Sixty years ago this month at Long Beach Harbor, Calif., after an arduous journey of development and political controversy, the H-4 Hercules—an airplane that's the world's largest and is still one of its most legendary—made its first and only flight.

The airplane—or perhaps more to the point, the flying boat—reflected the ambition of Howard Hughes, the renowned entrepreneur and the subject of the 2004 movie “The Aviator.” Hughes is connected to Boeing through the products created by Hughes-owned companies that are now part of Boeing, as well as his personal pur-

chase of a Boeing Stratoliner, the first airliner with a pressurized passenger cabin.

The Hercules originally was envisioned as a transport aircraft to support military activity. In 1942, when German U-boats were taking a tremendous toll on U.S. shipping, industrialist and shipbuilder Henry Kaiser conceived the idea of a large fleet of cargo-carrying flying boats. The movement of troops and war supplies

across the Atlantic Ocean to England was critical to the Allied effort in World War II, and perhaps the mission could be accomplished by air.

Kaiser approached aircraft designer Hughes, and together they formed the Hughes Kaiser Corporation. That year, they secured a U.S. government development contract for \$18 million to develop three large flying boats, each ca-

What big wings you have

A comparison of wingspans of several large aircraft, including the Hughes H-4 Hercules.

Hughes H-4 Hercules	320 feet (97.5 meters)
Antonov An-225 Mriya	290 feet (88.4 meters)
Convair B-36 Peacemaker	230 feet (70.1 meters)
Boeing 747-400	211.5 feet (64.5 meters)
Boeing B-52H Stratofortress	185 feet (56.4 meters)

pable of carrying up to 750 troops or two M4 Sherman tanks. However, because of wartime restrictions on strategic materials, the aircraft, designated the HK-1, would have to be made primarily of wood.

Not only was Hughes a perfectionist, but an aircraft of such a size presented design and assembly challenges that caused extensive delays. As a result, throughout the past 60 years a lot of misinformation has emerged about the flying boat. Known by many as the “Spruce Goose,” the airplane was actually made of birch. Hughes disliked the “Spruce Goose” tag and considered it disrespectful to the workers on the HK-1 team.

Despite delays, the assembly process was quite sophisticated and broke new ground. After purchasing the rights to produce the “Duramold” laminating process (first developed by Fairchild Aircraft Company), Hughes perfected it for aerodynamic shaping. The HK-1 team created cross-layered laminations of thin wood strips, injecting glue and then shaping and heating the segments until they solidified. Many aeronautical engineers considered the resulting wood aircraft sections to be stronger and lighter than aluminum. Fabric was used on the elevators and rudder to save additional weight.

Ultimately, the assembly schedule proved too slow for Kaiser. When he pulled out of the contract, Hughes renamed the airplane the H-4 Hercules. Once World War II ended, government funding for the

airplane was canceled, and the U.S. military’s post-war strategy didn’t call for procuring large airborne troop carriers. Yet, the determined Hughes continued injecting his own funding to keep the project alive.

Eventually the world’s largest flying boat was completed, and in June 1946 a team of 2,000 workers moved the aircraft overland in large sections, from the Hughes factory in Culver City, Calif., to a Long Beach Terminal Island dry dock. When finally assembled, the Hercules had an empty weight of more than 300,000 pounds, a wingspan of 320 feet, a length of 218 feet 6 inches, and a height of 79 feet (136,000 kilograms, and 97.5 meters, 66.6 meters and 24 meters, respectively).

Other H-4 innovations included the first “artificial feel system,” which provided more control authority on the control surfaces: The pilot’s yoke would respond as would that of a small aircraft yet multiply the control forces by 200 times to move the extremely large aerilons and rudder.

On the morning of Nov. 2, 1947, the mood was festive at Long Beach Harbor, as invited celebrities and members of the press were gathered to view the H-4 taxi tests. Everyone had expected the first flight the following spring.

After several test runs across the harbor, Hughes called for 15-degree flaps and increased power in the eight engines. Shortly, the behemoth was airborne at an altitude of 70 feet (21 meters) and flew at

80 mph for about a mile (129 kilometers per hour for about 1.6 kilometers). Some detractors later proclaimed that the huge aircraft actually remained in “ground effect,” which is the interaction of the down draft of an aircraft and the surface below it. Delta-winged aircraft commonly encounter this phenomenon during landing and their sink rate is reduced or cancelled out.

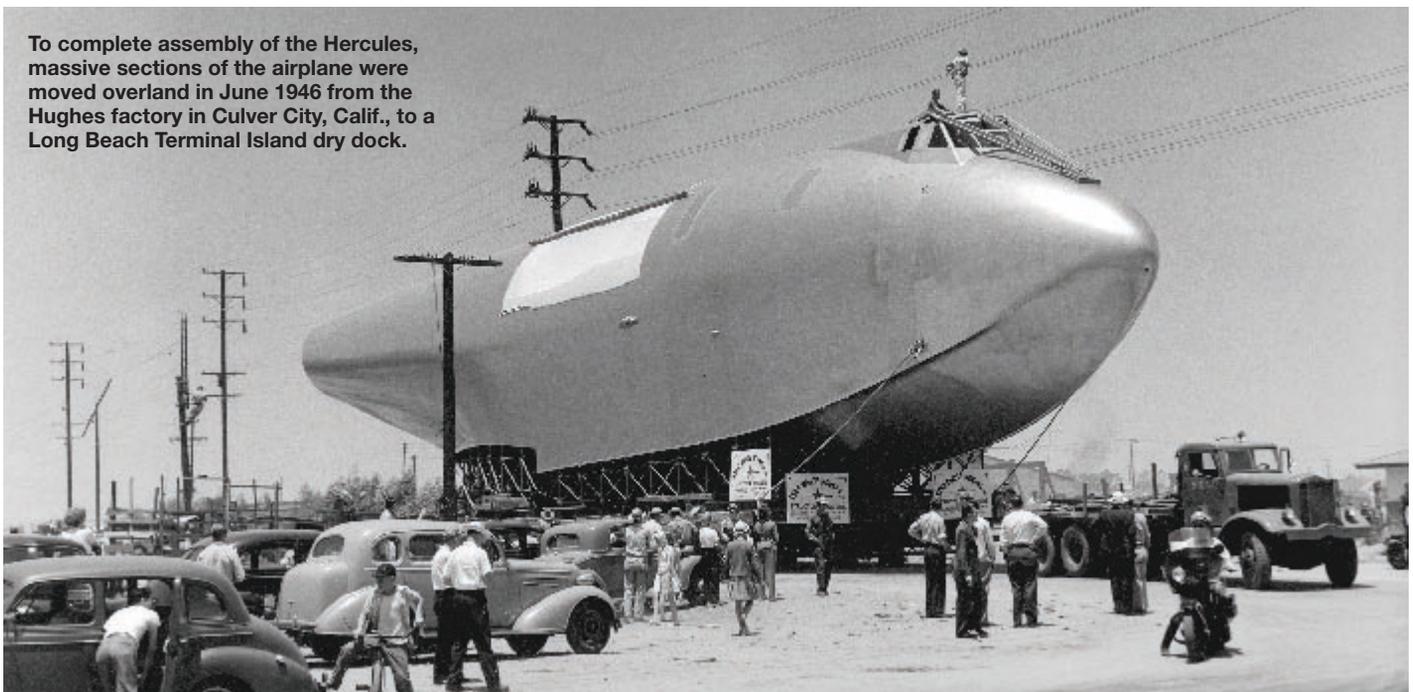
Nevertheless, the H-4 had flown, and Howard Hughes had proven his point. This would be the Hercules’ one and only flight—a flight of determination. ■

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After the flight

After the Hercules’ first flight, Howard Hughes ordered that the H-4 be stored in flying condition. Shortly after Hughes’ death in 1976, Hughes’ Summa Corporation donated the aircraft to the Aero Club of California. The airplane was preserved and displayed under a huge dome in Long Beach, Calif., next to the former ocean liner Queen Mary. In 1988, The Walt Disney Co. acquired both attractions. Disney sold the giant plane to the Evergreen Aviation Museum in 1993—which disassembled the aircraft and moved it to its current home in McMinnville, Ore.

To complete assembly of the Hercules, massive sections of the airplane were moved overland in June 1946 from the Hughes factory in Culver City, Calif., to a Long Beach Terminal Island dry dock.



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