

Howard Hughes' Top Ten

Wealthy beyond measure and weird beyond belief, Howard Hughes was an aerospace leviathan.

Airspace Magazine



Hughes' first record-setter was a Boeing 100A, a civilian version of the Army's P-12B pursuit aircraft. In January 1934 Hughes won the Sportsman Pilot Free-For-All at the Miami, Florida All- American Air Meet, averaging 185.7 mph over a 20-mile course. (Chas. E. Bulloch/NASM (SI Neg. #81-16961))

HEALTHY BEYOND MEASURE AND WEIRD BEYOND BELIEF, HOWARD HUGHES WAS a daredevil sportsman, legendary Lothario, Hollywood producer, Las Vegas mogul, and aerospace leviathan, a composite of myth and melodrama. No wonder he has inspired a cottage industry of biographies, memoirs, novels, and movies.

The latest Hughes biopic, directed by Martin Scorsese and starring Leonardo DiCaprio, is titled *The Aviator*, which may seem surprising to all but aviation enthusiasts. Although Hughes is remembered these days mostly for a pathological late-life fear of germs, he was once world-renowned as a record-setting pilot, a patron of pioneering aircraft, and a principal architect of the airline industry.

"Howard loved the drama of flying," says Robert W. Rummel, who worked with Hughes as a young engineer and later as a TWA executive. "He was an outstanding pilot, and in the cockpit, he seemed to exult in the freedom of flight. Of course, he was an astute businessman, and making money was one of the things that motivated him. But he had a sincere and abiding interest in aviation, and I think it was his one and only true love."

Hughes owned countless aircraft, which he stashed all over the country and flew whenever he felt like it or not at all. The following are the ones that played the most significant roles in Hughes' aviation affairs.

The Blue Streak Hughes went into the airplane business in 1934. At 28, he'd already produced and directed *Hell's Angels*, a film epic about World War I aerial combat, and he'd recently set a national speed record and won a race in a highly modified Boeing 100A biplane. Now he assembled a small team of employees into what would eventually become the Hughes Aircraft Company and embarked on the project that anchored his place in aviation history.

The company's first creation, the H-1, the 1B, or, his preference, simply the Racer, coupled noble proportions and graceful styling with leading-edge technology—many prop-heads call it the most beautiful airplane ever built. "The H-1 was an extraordinarily advanced example of what we would call a technology demonstrator," says aerospace historian Richard P. Hallion. "Monocoque stressed skin, flush rivets, hydraulic landing gear, and so on—for a guy who was just coming out of the box, if you will, it's a remarkable achievement."

Hughes harnessed the 1,000 horsepower of a Pratt & Whitney Twin Wasp Junior to set an international speed record of 352 mph in 1935 before making a gear-up landing in a bean field. In 1937, fitted with longer wings, the Racer took Hughes from coast to coast in seven hours, 28 minutes, breaking the transcontinental record he'd set the previous year in a Northrop Gamma. Hughes never flew the H-1 again. It was retired to a Quonset hut in Southern California after a mere 42 hours of flight time.

In 1975, Hughes had the Racer restored and trucked to the National Air and Space Museum, where it resides today. In 1998, a cadre of enthusiasts led by Jim Wright of Cottage Grove, Oregon, arrived in Washington, D.C., to take detailed measurements of the Racer. With that data, Wright and company reverse-engineered a replica that was the world's most ambitious homebuilt (see "Silver Bullet," Apr./May 2003). In 2002, Wright set a new speed record with it. Tragically, he was killed and his replica destroyed when he crashed in Yellowstone National Park last year.

Cabin Class The Racer whetted Hughes' appetite for more records. To set an around-the-world mark, he bought the sole Douglas DC-1 but dumped it almost immediately for an amphibian, which he could set down on water in case of an engine problem. Hughes already had plenty of experience with a Sikorsky S-38. He bought a new Sikorsky S-43, a twin-engine amphibian that was 70 mph faster than the S-38.

The S-43 proved to be unsuitable for around-the-world duty, but Hughes continued to modify it until crash-landing in Lake Mead, near Las Vegas, in 1943. "The [center of gravity] was just way too far forward," says Bruce Burk, who started working for Hughes in 1937 and later oversaw his personal fleet. "If it had happened on the ground, you would have called it a ground loop, so I guess this was a water loop."

Two passengers died when a propeller sliced through the fuselage. Hughes, who suffered minor injuries, spent a small fortune to recover the S-43 and a larger one rebuilding it. The airplane eventually landed at the Hughes Tool Company in Houston, where it sat for many years before the Hughes estate sold it in 1977.

Hughes had not abandoned his around-the-world dreams, however; he next chose an airliner for the trip, a Lockheed 14 Super Electra, one of only four sold to private owners. (The rest went to airlines.) Although the Super Electra was too small to compete with the DC-3 in the airline business, its speed made it an around-the-world contender. Hughes commissioned Lockheed to equip a 14-N2 with two G-series Wright Cyclone engines. His crew added extra fuel tanks and copious navigation equipment. In 1938, after a trip that lasted nearly four days, Hughes and three crewmen returned to a New York City ticker tape parade. "All we did," Hughes disingenuously told reporters, "was to operate this equipment and plane according to the instruction book."

Mission completed, Hughes set his sights on the more advanced Boeing 307 Stratoliner, which mated the wings and tail of a B-17 bomber to the fuselage of the world's first pressurized airliner. He had the customary long-range mods, but by the time the airplane was ready for an around-the-world attempt, most of the world was embroiled in war.

In the late 1940s, Hughes hired industrial designer Raymond Loewy to spruce up the Stratoliner with a deluxe interior featuring a bar, kitchen, powder room, sleeping quarters, and other amenities. But Hughes still didn't like the airplane, so he sold it to ostentatious Texas oilman Glenn McCarthy, the inspiration for Jett Rink in Edna Ferber's novel *Giant*. McCarthy never paid Hughes, and the Stratoliner—dubbed "Flying Penthouse" by a later owner—had accumulated only 500 hours by the time it was badly damaged by Hurricane Cleo in Fort Lauderdale in 1964.

Five years later, the airplane was saved from the scrap heap by Fort Lauderdale pilot and realtor Ken London, who bought it for \$69 and preserved most of the fuselage—including the cockpit—by transforming it into a houseboat. In 1981, Dave Drimmer bought it even though the Howard Hughes provenance sounded dubious. "I wanted the boat because it was funky and cheap, and if it was Howard Hughes' plane, well, how cool would that be?" he says. In 1994, while restoring the cockpit, he found the original Boeing data plate. Drimmer now rents out the boat for charters and tours (see www.planeboats.com for its history).

Hughes' ownership of a good chunk of TWA's stock gave him a vested interest in the development of airliners. In 1939, he sketched out the broad requirements for what eventually took form as the Lockheed 049 Constellation. The Constellation delivered high speed and great payload capacity in an elegant package featuring four neatly cowled engines, a triple tail, and a graceful dolphin-shaped fuselage. Beloved by pilots and passengers, it was the most refined airliner of its day, and it was ideally positioned for the postwar boom in intercontinental travel.

Hughes liked the Constellation so much that he bought 40 of them for TWA. But by the time they were built, the United States had declared war. TWA assigned the rights to its fleet to the Army Air Forces, which designated the craft C-69s: military transports. In 1944, Hughes and TWA president Jack Frye delivered the first Constellation to the military in person, sharing a new coast-to-coast record of a tick less than seven hours.

Hughes liked to claim credit for designing the Constellation, which so annoyed Lockheed design honcho Kelly Johnson that he justifiably demanded a retraction. "Eventually," Rummel recalls, "Howard agreed to say that he had conceived of the airplane while Johnson designed it. But privately," Rummell adds with a chuckle, "Howard told me that he had difficulty understanding the difference between conception and design."

The Black Period While Hughes was setting records in the 1930s, Hughes Aircraft was gearing up for the war effort. The design staff produced several concepts for the military competition won by the Lockheed P-38 Lightning. Hughes then embarked on his own project, unfettered by military requirements. Designed at various times to be a pursuit aircraft, attack aircraft, and bomber, it turned out to be none of the above.

Like the P-38, the D-2 featured an unusual twin-engine, twin-boom configuration. What made it unique was that it was built of alternating layers of heat-treated wood veneers and epoxy resin glues. This so-called Duramold process enabled exceedingly smooth surfaces. Better still, wood was cheap and widely available. But brief test flights in 1943 exposed the airplane's flaws. "It turned out to be a dog," Burk says. "The ailerons were almost completely ineffective, so it had no lateral control." It was no great loss when the lone D-2 was destroyed in 1944 by a fire said to have been caused by a lightning strike.

By this time, the politically savvy Hughes had already secured a military contract for the XF-11, a larger, more powerful all-metal version of the D-2. Designed as a 400 mph, high-altitude reconnaissance aircraft, it was powered by a pair of turbo-supercharged Pratt & Whitney R-4360-31s driving two pairs of counter-rotating propellers. "It was a very highly developed, well-thought-out design," Hallion says. "If Hughes hadn't been so wrapped up in the HK-1 [flying boat], that airplane might have entered the inventory."

As it was, the XF-11 wasn't completed until the war ended. On the craft's 1946 maiden test flight, an oil leak caused the right rear propeller to reverse pitch, the engine lost power, and the airplane crashed in Beverly Hills, damaging some houses. Hughes, the only one injured, was pulled from the wreckage in critical condition. While he recuperated, a second XF-11 was assembled with conventional four-blade props. Nine months after the accident, Hughes successfully flew the airplane. It then passed into the hands of the Army Air Forces before being scrapped in 1949.

The Beginning of the End The D-2/XF-11 was an expensive failure, but Hughes' biggest flop'literally'was yet to come. Like many follies, this one initially seemed to make sense: Pair Hughes with industrialist Henry J. Kaiser, creator of the Liberty ships, to build a gargantuan flying boat to ferry 750 troops overseas. To save money and use a non-critical resource, the HK-1 would be constructed of wood, using the Duramold process. A government contract was signed in 1942, but thanks to Hughes' perfectionism and procrastination, the aircraft was still unfinished at war's end. "It dragged on and on and on and on until it was just another useless aircraft," Burk says. "But it sure kept a lot of people busy."

After Kaiser bailed out of the project, the airplane was given several names: H-4, Hercules, Flying Boat. Popularly, it was known as the "Spruce Goose"—a misnomer since most of the wood was birch—or "Flying Lumberyard." In 1947, it was the subject of Senate hearings into allegations of war profiteering. Exonerated, Hughes crowed to the press, "I designed every nut and bolt that went into this airplane.... I have stated that if it fails to fly, I will leave the country. And I mean it."

Accordingly, the largest wooden airplane ever flown—20 percent larger than a 747—taxied into Long Beach Harbor in California later that year. While a crowd watched, Hughes rocked the eight-engine H-4 off the water and flew about a mile at the dizzying altitude of 70 feet. Thereafter, the H-4 was kept ready to fly in a climate-controlled hangar. After Hughes' death (and torturous negotiations), the H-4 moved to a dome in Long Beach, where it became a tourist attraction. In 1992, it was disassembled and shipped to McMinnville, Oregon, where it was reconstituted as the centerpiece of the Evergreen Aviation Museum.

A Final Flirtation The Flying Boat was the last airplane the Hughes Aircraft Company built. In 1949, Hughes paid \$250,000 to Kellett Aircraft for the rights to the XH-17, an experimental heavy-lift helicopter funded by the Air Force. Nicknamed the "Flying Crane" after Hughes Aircraft bought it, it was equipped with a 130-foot, two-blade rotor. Two Allison J-35 jet engines, modified by General Electric to act as compressors and designated TG-180s, fed compressed air through the hollow rotor blades to the tips, where fuel was ignited in burners to produce thrust. The rotors turned at a leisurely 88 rpm, but the effect was monstrous.

"Flames began to shoot out the tip burners, making a gigantic Fourth of July pinwheel," the Los Angeles Times reported in 1952, when Gale Moore made the first official flight off the Hughes runway in Culver City. "From 50 feet away, the whoosh-whoosh of the whirring blades sounded like hundreds of artillery shells in flight.... Then, with a great, bracing quiver, the helicopter raised itself from the ground, its four wheels at the end of its stork-like supports hanging free. The noise was numbing."

Moore accumulated 10 hours of flight time before the program ended in the mid-1950s. Although a follow-on Flying Crane program failed for lack of funds, helicopters turned out to be the key to a profitable future for Hughes Aircraft. Hughes himself, though, had no interest in rotary-wing technology, and the first flight of the XH-17 was the last time he visited the helicopter factory.

Hughes died on April 5, 1976. Fittingly, he was aboard a Learjet 25B at the time.

For aerial coordinator Craig Hosking, the good news was the screenplay for *The Aviator* called for both flying sequences featuring Hughes Racer, the XF-11, and the H-4 Flying Boat. The bad news was that there were no flyable examples of these airplanes. So Hosking, a veteran of aerial extravaganzas ranging from *Con Air* to *The Sum of All Fears*, had to dig deep into his bag of cinematic tricks.

"We used every process known to man on this movie," he says. "And when that wasn't enough, we invented new ones."

The Miramax movie, which follows Howard Hughes from the late 1920s to the late '40s, posed a host of challenges. For example, for the opening scene--the making of Hell's Angels--Hosking and assistant aerial coordinator Matt Sparrow had to sweet-talk owners all over the country to amass a fleet of 15 World War I airplanes, mostly Fekker D.VII and Sopwith Camel replicas.

Later, a privately owned Sikorsky S-38 reproduction acted as Hughes' first amphibian, and a Lockheed Super Constellation flew in from the Airline History Museum in Kansas City, Missouri, to serve as the template for a computer-generated sequence showing dozens of Constellations on an airport ramp.

Meanwhile, special effects supervisor Bruce Steinheimer oversaw the construction of full-scale mockups of the Racer, the XF-11, and the H-4. (There was also a mockup of the Flying Boat's flight deck) The back half of a Vultee BT-13 Valiant was fashioned to look like the Racer so Leonardo DiCaprio could be filmed in the rear cockpit while Hosking flew from the forward cockpit.

For the XF-11, model makers built a bizarre contraption consisting of a full-scale canopy nestled between stunted wings that look life-size when filmed through a forced-perspective camera. "I fought long and hard against it because I didn't think it would look realistic," Hosking says. "But by golly, I had to eat my words."

In addition, Miramax built remote-controlled scale models of all three airplanes. For what he believes to be the first time ever, Hosking filmed them from a helicopter while he flew close formation with the models, which were controlled by RC pilots. "It was a little tricky," he admits. "But in effect, I was the wingman, so it was up to me to keep separation."

Hosking tried to minimize the computer-generated stuff and the use of blue-screen technology--the modern version of the old-timey movie technique in which the driver sits at the steering wheel while the background dances around behind him. So how did he crash the XF-11?

He laughs. "I left that up to the computer guys."