Background/Early History

In 1940, when Howard Hughes was 34 years old, he bought 380 acres at the foot of the Westchester Bluffs for $500,000. Hughes wanted the sizable chunk of land for his aviation firm, Hughes Aircraft Company, which he had started in Glendale, California in 1932.

The new company plant would be located on what was then unincorporated Los Angeles County land, just southwest of Culver City. The land was down the bluffs from Loyola Marymount University (LMU), on the eastern end of the Ballona Wetlands marsh area.

The new Hughes Aircraft plant, which became fully operational in July 1941, contained 60,000 feet of floor space in several buildings. In 1943, Hughes built the world’s longest private runway at the plant, an unpaved strip nearly 2 miles in length. (The strip was paved in 1948)

Also in 1943, construction began on what would become the plant’s most famed structure, Building 15. The gigantic 315,000-square-foot structure was 750 feet long, 250 feet wide and 75 feet high. It was built to accommodate the creation of the HK-1 Hercules Flying Boat, a joint venture between Hughes and industrialist Henry J. Kaiser.

XH-17 Flying Crane

The first helicopter built by Hughes was the giant XH-17. It was a limited flight test designed in response to a military proposal for a helicopter that could air-lift a tank.

Figure 1: A circa 1960s aerial view looking west at the Hughes facility showing administration buildings 1-3 in the foreground. Building 15 is at the left middle with twin roofs. LMU is atop hill at top center. (photo courtesy of Hughes employee Kurtis Clark)

Figure 2: Building 15 under construction in 1943 (Credit: Hughes Industrial Historic District website)

Figure 3: A 1947 photo of the rollout of the Hughes HK-1 Hercules flying boat fuselage from Building 15.

The Hughes Company Developed and Tested a Variety of Advanced Experimental Helicopters in the 1950s & 1960s.
or similar large and heavy loads. The contract for the XH-17 was originally awarded to Kellett Aircraft in Pennsylvania but was sold to Hughes in 1948. As a flying test rig, the XH-17 utilized as many existing parts as possible, including a cockpit from a Waco CG-15 glider, landing gear from both a B-25 and C-54, and a bomb-bay fuel tank from a B-29. A pair of General Electric J35 jet engines were modified to route bleed air into the 130 foot 2-bladed rotor, where the air was mixed with fuel at the rotor tips in 4 burners. With the giant rotor turning at only 88 rpm, the engines & pressure-jets were expected to produce 3,480 hp. Testing of the XH-17 validated the basic design concept, the aircraft having lifted loads of over 10,000 pounds.

Figure 4: Ground tests of the XH-17 began in December of 1949 and the first flight occurred in October of 1952.

XH-28 Flying Crane

One of the most unusual aircraft to be developed by Hughes at Culver City was the massive XH-28 flying crane helicopter. The XH-28 was intended to be an enlarged operational follow-on to the XH-17. Development of the XH-28 was begun in January 1951 to meet an Army requirement for a flying crane capable of transporting combat-loaded military vehicles weighting up to 20 tons. Like the XH-17 which was then about to be flown, the XH-28 was to use a pressure-jet system to drive the 4-bladed main rotor, with 2 Allison XT40-A-8 turbines being geared to a compressor unit with compressed air dueled to burners at the tip of each blade.

Weighing 105,000 pounds fully loaded, the XH-28 was to have had enclosed accommodation for 2 pilots. Its 4 tall undercarriage units, each with dual-wheels, would have given it a spider look while providing adequate clearance for outsize loads. These loads were to have been either slung beneath the fuselage or carried on a flat-bed attached between the undercarriage legs and fitted with a ramp for loading & unloading vehicles.

The XH-28 design was subjected to extensive wind tunnel tests with various suspended loads, and a full-scale wooden mock-up was completed inside Hughes' Building 15 (the former Spruce Goose assembly hall) by 1954-55. In spite of the XH-28's promising capability, the program was canceled due to cutbacks in the research & development budget made near the end of the Korean War, and no actual XH-28 helicopter was ever built.

Model 385: XV-9A Hot-Cycle

The Model 385 was designed and built under a United States Army research contract to prove a concept known as hot-cycle propulsion. The helicopter was given the military designation XV-9A with the serial number 64-15107. Two General Electric YT64-GE-6 turbojets were used as gas generators. The jet efflux was ducted to nozzles at the blade tips. The rotor blades also had cooling ducts in both
the leading and trailing edges. To keep costs to a minimum
the cockpit with two side-by-side seats of an OH-6A was
used and the landing gear was from a Sikorsky H-34.

The U.S. Army chose the 269A as its new primary training
helicopter and designated it as the TH-55. After an initial
order for twenty helicopters, the number delivered to the
Army climber to 792 with final delivery in March 1969.

Model 369: Army OH-6A

In 1960, the United States Army issued Technical
Specification 153 for a Light Observation Helicopter
(LOH) capable of fulfilling various roles: personnel
transport, escort and attack missions, casualty evacuation
and observation. Twelve companies took part in the
competition and Hughes Tool Company's Aircraft Division
submitted the Model 369. Two designs, those submitted by
Fairchild-Hiller and Bell, were selected as finalists by the
Army-Navy design competition board, but the U.S. Army
later included the helicopter from Hughes as well.

The first Model 369 prototype flew on 27 February 1963.
Originally designated as the YHO-6A according to the
Army's designation system, the aircraft was re-designated
as the YOH-6A in 1962. Five prototypes were built.

Hughes won the competition, and the Army awarded a
contract for production in May 1965, with an initial order
for 714 that was later increased to 1,300 with an option on
another 114. Controversy of the pricing soon followed.

The aircraft entered service in 1966, arriving in the Viet-
Nam War soon after. The pilots dubbed the new helicopter
Loach, a word created by pronunciation of the acronym of
the program that spawned the aircraft, LOH (Light
Observation Helicopter). The OH-6 and its variants have
become a favorite of Special Operation’s Aviation forces to
this day.

Hughes Production Helicopters

Model 269A: ARMY TH-55A

The first delivery to a civilian customer signaled the start of
a program that eventually produced about 2,900 variants of
the Model 269. By the middle of 1963, the production line
in Building 15 was producing 20 helicopters a month.

The helicopter first flew on November 5, 1964. After test
flights at the Hughes facility in Culver City, California, the
XV-9A was transferred to Edwards Air Force Base for
further tests. The tests were satisfactory and the company
was confident that the hot-cycle system would be used, but
the XV-9A was noisy and had high fuel consumption.

The company was unable to mitigate the problems and the
development by Hughes of pressure-jet systems did not
proceed. The Army tests were completed in August 1965
and the helicopter was returned to Hughes.

Hughes Production Helicopters

Model 269A: ARMY TH-55A

The first delivery to a civilian customer signaled the start of
a program that eventually produced about 2,900 variants of
the Model 269. By the middle of 1963, the production line
in Building 15 was producing 20 helicopters a month.

The first Model 369 prototype flew on 27 February 1963.
Originally designated as the YHO-6A according to the
Army's designation system, the aircraft was re-designated
as the YOH-6A in 1962. Five prototypes were built.

Hughes won the competition, and the Army awarded a
contract for production in May 1965, with an initial order
for 714 that was later increased to 1,300 with an option on
another 114. Controversy of the pricing soon followed.

The aircraft entered service in 1966, arriving in the Viet-
Nam War soon after. The pilots dubbed the new helicopter
Loach, a word created by pronunciation of the acronym of
the program that spawned the aircraft, LOH (Light
Observation Helicopter). The OH-6 and its variants have
become a favorite of Special Operation’s Aviation forces to
this day.

Hughes Production Helicopters

Model 269A: ARMY TH-55A

The first delivery to a civilian customer signaled the start of
a program that eventually produced about 2,900 variants of
the Model 269. By the middle of 1963, the production line
in Building 15 was producing 20 helicopters a month.

The first Model 369 prototype flew on 27 February 1963.
Originally designated as the YHO-6A according to the
Army's designation system, the aircraft was re-designated
as the YOH-6A in 1962. Five prototypes were built.

Hughes won the competition, and the Army awarded a
contract for production in May 1965, with an initial order
for 714 that was later increased to 1,300 with an option on
another 114. Controversy of the pricing soon followed.

The aircraft entered service in 1966, arriving in the Viet-
Nam War soon after. The pilots dubbed the new helicopter
Loach, a word created by pronunciation of the acronym of
the program that spawned the aircraft, LOH (Light
Observation Helicopter). The OH-6 and its variants have
become a favorite of Special Operation’s Aviation forces to
this day.
The Apache began as the Model 77 developed by Hughes Helicopters at Culver City for the United States Army's Advanced Attack Helicopter program to replace the AH-1 Cobra. The prototype YAH-64 was first flown on September 30, 1975. The U.S. Army selected the YAH-64 over the Bell YAH-63 in 1976, and later approved full production in 1982. The first five Apache prototypes (YAH-64 AV02 through AV06) were built at Culver City, but the first Apache prototype was trucked to Palomar Airport for its first flight.

After the Apache was selected as the winner of the Army’s Advanced Attack Helicopter competition in 1981, Hughes Helicopter announced that production of the helicopter would not take place at Culver City, but rather at a newly-built facility in Mesa, Arizona. This move was no doubt motivated by the much lower cost of doing business in Arizona compared to the crowded Los Angeles area.

In 1983, the first production helicopter was rolled out at the new Hughes Helicopter facility at Mesa, Arizona. In the years since, the AH-64 and its variants have been purchased by several foreign nations establishing itself as one of the world’s premiere attack helicopters.

The Apache became the basis for the AH-64 Apache. Note the differences from what would eventually become the Apache - the rounded canopy, the lack of avionics bays on the side of the nose, the TOW missile launchers, etc.

The Culver City production line for the Army's OH-6A in 1968. At peak production, over 100 OH-6A's were built per month. The Hughes Culver City facility eventually became the Hughes Helicopter Company, where thousands of civil & military helicopters were built, including the Hughes 300, 500, and OH-6 models.

Model 77: Army AH-64 Apache

Figure 10: The Culver City production line for the Army's OH-6A in 1968. At peak production, over 100 OH-6A's were built per month. The Hughes Culver City facility eventually became the Hughes Helicopter Company, where thousands of civil & military helicopters were built, including the Hughes 300, 500, and OH-6 models.

Figure 11: An undated photo of a mockup of the Hughes Helicopter Model 77, which was selected to become the basis for the AH-64 Apache. Note the differences from what would eventually become the Apache - the rounded canopy, the lack of avionics bays on the side of the nose, the TOW missile launchers, etc.

Figure 12: The maiden flight of YAH-64 helicopter number AV02 with Bob Ferry and Raleigh Fletcher at the controls.

Figure 13: A 1977 Hughes public relations photo looking west at the Hughes Airfield. (courtesy of former Hughes employee Jerry Dutcher)
The Closing of Hughes Helicopters

In 1984 the trustees of the Howard Hughes estate announced the sale of the Hughes Helicopter Company to McDonnell Douglas. Not long after the acquisition, McDonnell Douglas decided to end manufacturing of complete aircraft at Culver City, and moved the Light Helicopter production line (the Hughes 500 and its derivatives) to a newly constructed facility in Mesa as well, adjacent to the new Apache plant. That left the Culver City facility with the production of components for the Apache and MD-500.

The last aircraft taxied down Culver City's Runway 23 in 1985. Playa Capital Corporation had shortened the runway to 4,000 feet to make room for their Playa Vista development. The runway pavement has since been reduced to aggregate, to be used to pave the streets of planned new developments at the site.

The closure of this airfield was just a matter of time, as it was located in what became an extremely densely populated area. Los Angeles International Airport is a mere one mile to the south, making continued flight operations at the site nearly impossible.

The Culver City facility continued to produce components for the Apache, until it was shut down in the 1990s by new corporate owner McDonnell Douglas.

The campus still remains, however, as a historical and architectural legacy. The Hughes Airfield site today, now known as "Hercules Campus at Playa Vista - Spruce Goose Hangar," is located in what became an extremely densely populated area. Los Angeles International Airport is a mere one mile to the south, making continued flight operations at the site nearly impossible.

The last aircraft taxied down Culver City's Runway 23 in 1985. Playa Capital Corporation had shortened the runway to 4,000 feet to make room for their Playa Vista development. The runway pavement has since been reduced to aggregate, to be used to pave the streets of planned new developments at the site.

The closure of this airfield was just a matter of time, as it was located in what became an extremely densely populated area. Los Angeles International Airport is a mere one mile to the south, making continued flight operations at the site nearly impossible.

The Culver City facility continued to produce components for the Apache, until it was shut down in the 1990s by new corporate owner McDonnell Douglas.

Culver City/Playa Vista Today
Google, Spruce Goose, Playa Vista, CA

Figure 14: A 2015 aerial view looking west at the Hughes Airfield site showing the former Hughes Building 15 surrounded by a massive amount of new buildings and development. The runway is long gone. (photo courtesy of Dan Allen)

In 1991, the Army Corps of Engineers determined that the original Hughes buildings qualified for inclusion on the National Register of Historic Places as the Hughes Industrial Historic District. By then, several of the 22 Hughes structures had been demolished as activity at the facility slowed.

Fortunately, the most notable of the 11 remaining buildings are the administration buildings (1, 2 and 3) and cargo buildings (Building 15). As historical sites, they were protected from demolition.

The cargo building, where the Spruce Goose was built, has been used as a movie studio sound stage in recent years. Howard Hughes personal hardwood paneled office is still inside the administration buildings.

Figure 15: Now known as “Hercules Campus at Playa Vista - Spruce Goose Hangar.” ZGF partnered with Google and sought to transform the landmark Spruce Goose Hangar in their modern Playa Vista, California Campus to bring a fresh perspective to workplace design through the venue’s adaptive reuse.

ZGF is an award-winning architecture and interior design firm with offices in Los Angeles, New York, Portland, Seattle, Vancouver, Canada, and Washington, D.C. ZGF partnered with Google to transform the landmark Spruce Goose Hangar in Playa Vista, California.

At 450,000+ square feet, a four-level “building-within-a-building” was developed inside the seven-story, 750-foot-long historic wooden structure. Built by Howard Hughes in 1943 for the construction of the Hercules IV airplane (aka the “Spruce Goose”), the hangar now comprises office, meeting, food service and event spaces, as well as employee amenity spaces.

Located between two existing Google sites, Google sought to unify their Playa Vista campus and bring a fresh perspective to workplace design through the venue’s adaptive reuse.

In renovating the space by adding over 100,000 square feet, Google had a chance “to honor the history of the building and work for what they believed the future of work was going to be—spaces that are moldable and flexible, not tied to your desk,” says Google spokesperson Katherine Will.
REFERENCES


Figure 16: Google built a long, ship-like four-story structure within the hangar where Howard Hughes built the Spruce Goose. (Photo by Connie Zhou, courtesy of Google)

Figure 17: A 2013 photo of a classic Hughes 300 helicopter which has been restored and on display outside the entrance of its birthplace, Building 15. (photo courtesy of Pierce Cook)