

Hughes Aircraft



Hughes logo, adopted after death of its founder



Hughes developed the [AIM-120 AMRAAM](#), one of the world's most advanced air-to-air missiles

Hughes Aircraft Company was a major aerospace and defense company founded by [Howard Hughes](#). The group was based near Ballona Creek, in [Culver City, California, USA](#), on the [Pacific Coast](#).

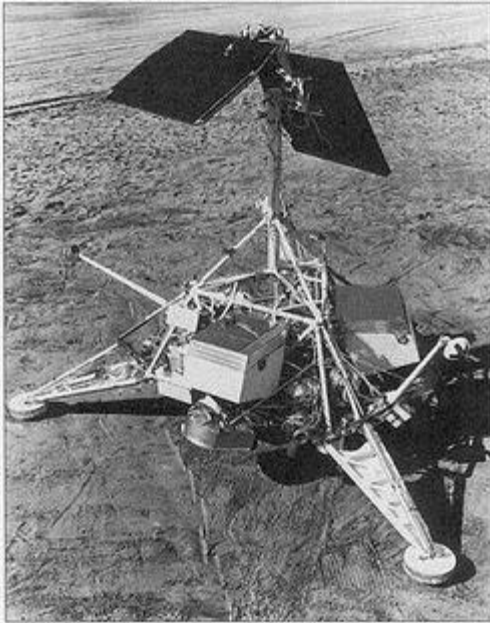
Hughes Aircraft was acquired by [General Motors](#) in 1985. GM sold off the aerospace and defense operations during the late 1990s; Hughes Aircraft was sold to Raytheon in 1997 and the [Hughes Research Laboratories](#) became jointly owned by Boeing, GM, and Raytheon. Hughes Space and Communications Company was purchased by [Boeing](#) in 2000 and renamed [Boeing Satellite Development Center](#). GM sold the remainder of Hughes Electronics to [News Corporation](#) which renamed the company [DirecTV Group](#).

History

Hughes H-4 Hercules "Spruce Goose"



Hughes' Galileo probe being deployed



Hughes-built NASA Surveyor lunar lander

In 1932, [Howard Hughes Jr.](#) formed Hughes Aircraft Company as a division of the [Hughes Tool Company](#)^[1]. In 1935 Hughes, with his trusted friend and aviation engineer [Glenn Odekirk](#), built the [H-1 Racer](#), which included every [streamlining](#) concept then known, including retractable [landing gear](#), a fully enclosed cockpit, and the first use of recessed rivets. The H-1 captured a number of speed records during the next few years, and made Hughes a household name.^[citation needed]

During World War II the company designed and built several prototype aircraft including the famous [Hughes H-4 Hercules](#), better known as the "Spruce Goose". However the plant was used primarily as a [branch plant](#) for the construction of other company's designs. At the start of the war Hughes Aircraft had only four full-time employees — by the end the number was 80,000.^[2]

Post World War II

Hughes Aircraft was one of many aerospace and defense companies which flourished in [Southern California](#) during and after [World War II](#) and was at one time the largest employer in the area.

By the summer of 1947, certain politicians had become concerned about Hughes' mismanagement of the Spruce Goose and the [XF-11](#) photo reconnaissance plane project. They formed a special committee to investigate Hughes, but when he successfully tested both planes and then turned them over to the military, they no longer had a target to attack. Despite a highly critical committee report, Hughes was cleared.

In 1948 Hughes created a new division of the company, the **Aerospace Group**. Two Hughes engineers, [Simon Ramo](#) and [Dean Wooldridge](#), had new ideas on the packaging of electronics to make complete [fire control systems](#). Their [MA-1](#) system combined signals from the aircraft's [radar](#) with an [analog computer](#) to automatically guide the [interceptor aircraft](#) into the proper position for firing missiles. At the same time other teams were working with the newly formed [US Air Force](#) on air-to-air missiles, delivering the [AIM-4 Falcon](#), then known as the F-98. The MA-1/Falcon package, with several upgrades, was the primary interceptor weapon system in the US for many years, lasting into the 1980s. Ramo and Wooldridge, having failed to reach an agreement with Howard Hughes regarding management problems, resigned in September 1953. They founded the [Ramo-Wooldridge Corporation](#), later to join [Thompson Products](#) to form [TRW](#), another aerospace company and a major competitor to Hughes Aircraft.

Howard Hughes donated Hughes Aircraft to the newly formed [Howard Hughes Medical Institute](#) in 1953 allegedly as a way of avoiding taxes on its huge income.^[3] The next year, [L.A. "Pat" Hyland](#) was hired as vice president and general manager of Hughes Aircraft;^[1] he would ultimately become company president and CEO after Howard Hughes' death in 1976.

Under Hyland's guidance, the Aerospace Group continued to diversify and become massively profitable, and became a primary focus of the company. The company developed [radar](#) systems, electro-optical systems, the first working [laser](#), aircraft computer systems, missile systems, [ion-propulsion engines](#) (for space travel), and many other advanced technologies. The [Electronic Properties Information Center](#) (EPIC)^[4] of the United States was hosted at the Hughes Culver City library in the 1970s. EPIC published the multi-volume *Handbook of Electronic Materials* as public documents.

[Nobel Laureates Richard Feynman](#) and [Murray Gell-Mann](#) had Hughes connections: Feynman would hold weekly seminars at **Hughes Research Laboratories**; Gell-Mann shared an office with Malcolm Currie, later a Chairman of the Board and Chief Executive Officer at Hughes Aircraft. [Greg Jarvis](#) and [Ronald McNair](#), two of the astronauts on the [last flight](#) of the [Space Shuttle Challenger](#) were Hughes alumni.

Hughes Space and Communications Company

See also: [Boeing Satellite Development Center](#)

Hughes Space and Communications Company was formed as a subsidiary of Hughes Aircraft in 1961 following the merger of the company's Space and Communications Group and the Hughes Space Systems Division.^[2] This division built the world's first geosynchronous [communications satellite](#), [Syncom](#), in 1963 and followed it closely with the first geosynchronous weather satellite, ATS-1, in 1966. Later that year their [Surveyor 1](#) made the first soft landing on the [Moon](#) as part of the lead-up to the moon landings in [Project Apollo](#). Hughes also built [Pioneer Venus](#) in 1978, which performed the first extensive radar mapping of [Venus](#), and the [Galileo probe](#) that flew to [Jupiter](#) in the 1990s.^[2] The company built nearly 40 percent of the satellites in service worldwide in 2000.^[citation needed]

Hughes Helicopter Business

Main article: [Hughes Helicopters](#)

In 1947, Howard Hughes redirected Hughes Aircraft's efforts from airplanes to helicopters. The effort began in earnest in 1948 when [helicopter](#) manufacturer Kellett Aircraft Co. sold their latest design to Hughes for production. The [H-17 Sky Crane](#) first flew in October 1952, but was commercially unsuccessful. In 1955, Howard Hughes split the helicopter production unit from the Hughes Aircraft Company, and reconstituted it with Hughes Tool Company calling it **Hughes Tool Company's Aircraft Division**. The Aircraft Division had a focus on the production of light helicopters, mainly the [Hughes 300](#) and the [OH-6 Cayuse/Hughes 500](#).

Howard Hughes Medical Institute sells Hughes Aircraft Company

Hughes left no will and following his death in 1976 there were numerous claims to his estate. A Hughes executive and a Hughes lawyer claimed they had the right to set up an "executive committee" to take over the running of the HHMI and its Hughes Aircraft subsidiary. The [Attorney General of Delaware](#) [Richard R. Wier](#) challenged this and filed suit in 1978. [Charles M. Oberly](#) continued the action when he became attorney general in 1983. Oberly stated he wished to see an independent

board of trustees to ensure both that the institute fulfilled its charitable mission and that it did not continue to operate as a tax shelter.^[5]

In January 1984 Judge Grover C. Brown ruled that the Chancery Court should appoint the trustees because Hughes had not left a succession plan. Brown asked for the both the executive committee and the attorney general's office to submit a list of recommendations that he could approve. Brown approved a list in April 1984.^[5] In January 1985 the new board of trustees of the HHMI announced they would sell Hughes Aircraft either by private sale or public stock offering.^[6]

Hughes Electronics Corporation



Hughes logo, adopted after its new owner General Motors



Display of a Hughes satellite inside the [Space Shuttle Explorer](#).

On June 5, 1985 [General Motors](#) was announced as the winner of a secretive five month, sealed-bid auction. Other bidders included [Ford Motor Company](#) and [Boeing](#).^[7] The purchase was completed on December 20, 1985 for an estimated \$5.2 billion, \$2.7 billion in cash and the rest in 50 million shares of GM Class H stock.^[8]

On December 31, 1985 General Motors merged Hughes Aircraft with its [Delco Electronics](#) unit to form Hughes Electronics Corporation, an independent subsidiary. The group then consisted of: Delco Electronics Corporation, Hughes Aircraft Company, Hughes Space and Communications Company, Hughes Network Systems, and DirecTV.

In August of [1992](#) Hughes Aircraft completed its purchase of [General Dynamics](#)' missile businesses for \$450 million.^[9] This brought the [Tomahawk Cruise Missile](#), [Advanced Cruise Missile](#), [Standard missile](#), [Stinger missile](#), the [Phalanx Close-in weapon system](#) and the [Rolling Airframe Missile](#) into Hughes' portfolio.

In [1994](#) Hughes Electronics introduced [DirecTV](#), the world's first high-powered DBS service. In [1995](#) Hughes Electronic's [Hughes Space and Communications](#) division became the largest supplier of commercial satellites. Also in 1995 the group purchased [Magnavox Electronic Systems](#) from the [Carlyle Group](#). In [1996](#) Hughes Electronics and [PanAmSat](#) agree to merge their fixed satellite services into a new publicly held company, also called PanAmSat with Hughes Electronics as majority shareholder.

In [1997](#) GM transferred Delco Electronics to its [Delphi Automotive Systems](#) business. Late in the year Hughes Aircraft was demerged and sold to [Raytheon](#) for \$9.5 billion.^[10] The remaining companies remained under the Hughes Electronics name and within GM.

Hughes Space and Communications Company was purchased by [Boeing](#) in 2000 and became [Boeing Satellite Development Center](#). In [2003](#) the remaining parts of Hughes Electronics: DirecTV, DirecTV Latin America, PanAmSat and Hughes Network Systems were purchased by [NewsCorp](#) from GM and renamed **The DirecTV Group**.

Hughes' Legacy

The amazing range of science and technology spawned by the workers at Hughes Aircraft never included medical applications, because the company was a property of the Howard Hughes Medical Institute, which exists to this day. This restriction was imposed to avoid even the appearance of a conflict of interest. Ironically, medical applications may well become Hughes' greatest legacy.

Timeline

- [1932](#): Howard Hughes formed Hughes Aircraft Company as a division of Hughes Tool Company.
- [1948](#): Hughes formed the **Aerospace Group** within the company, divided into:
 - Hughes Space and Communications Group
 - Hughes Space Systems Division
- [1953](#): The **Howard Hughes Medical Institute** (HHMI) was formed, and Hughes Aircraft reformed as a subsidiary of the foundation. The [Internal Revenue Service](#) unsuccessfully challenged its "charitable" status which made it tax-exempt.
- [1955](#): Hughes formed its helicopter division, **Aircraft Division**
- 1960: The first [laser](#) is produced at Hughes Research Laboratories, by [Theodore Maiman](#)
- [1961](#): **Hughes Space and Communications Company** was formed, bringing together Hughes Space and Communications Group and the Hughes Space Systems Division and **Hughes Research Laboratories** completed its move to Malibu.
- 1972: Hughes sold the tool division of Hughes Tool Company. His remaining interests were transferred to the newly formed holding company, the [Summa Corporation](#). This included Toolco Aircraft and Hughes' property and other businesses.
- [1976](#): Toolco Aircraft became **Hughes Helicopters**
- 1976: Howard Hughes dies at the age of 70, leaving no will
- [1984](#): The Summa Corporation sold Hughes Helicopters to [McDonnell Douglas](#) for \$500 million; it was soon renamed **McDonnell Douglas Helicopters**.
- 1984: The [Delaware Court of Chancery](#) appointed eight trustees to the Howard Hughes Medical Institute; they decide to sell Hughes Aircraft.
- [1985](#): The HHMI sold Hughes Aircraft to [General Motors](#) for \$5.2 billion. This was merged with GM's [Delco Electronics](#) to form **Hughes Electronics**. This group then consisted of:
 - Delco Electronics Corporation
 - Hughes Aircraft Company
 - Hughes Space and Communications Company
 - Hughes Network Systems
 - DirecTV
- [1987](#): Hughes Aircraft Company acquires M/A-COM Telecommunications, to form [Hughes Network Systems](#)
- [1994](#): Hughes Electronics introduces [DirecTV](#)
- [1995](#): Hughes Space and Communications Company became the world's biggest supplier of commercial satellites

- 1995: Hughes Electronics acquires [Magnavox Electronic Systems](#) from the [Carlyle Group](#)
- 1996: Hughes Electronics and [PanAmSat](#) agree to merge their fixed satellite services into a new publicly held company, also called PanAmSat with Hughes Electronics as majority shareholder.
- [1997](#): GM transferred Delco Electronics from Hughes Electronics to its [Delphi Automotive Systems](#). Delphi became independent in 1999.
- 1997: The aerospace and defense operations of Hughes Electronics (Hughes Aircraft) are merged with [Raytheon](#); Raytheon also acquired one half of the Hughes Research Laboratories
- [2000](#): Hughes Space and Communications Company remained independent until 2000, when it was purchased by [Boeing](#) and became [Boeing Satellite Development Center](#). Boeing purchased one third of the Hughes Research Laboratories LLC which is now co-owned by Boeing, GM and Raytheon.
- 2003: The remaining parts of Hughes Electronics: DirecTV, DirecTV Latin America, PanAmSat and [Hughes Network Systems](#) were purchased by [NewsCorp](#) and renamed [The DirecTV Group](#).
 - Newscorp sold PanAmSat to [Kohlberg Kravis Roberts & Co.](#) (KKR) in August 2004.
 - [SkyTerra](#) Communications, Inc. completed its purchase of 100% controlling interest in Hughes Network Systems from the DirecTV Group in January 2006.

References

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