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Guide to the Edward C. Light Schematic Drawings of the Hughes H-4 Hercules "Spruce Goose" Seaplane

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Summary Information

Repository:	University of Nevada, Las Vegas. University Libraries. Special Collections and Archives.
Creator:	Hughes Aircraft Company
Engineer:	Light, Edward C., 1917-1992
Title:	Edward C. Light Schematic Drawings of the Hughes H-4 Hercules "Spruce Goose" Seaplane
ID:	MS-00920
Date [inclusive]:	1941-1950
Physical Description:	0.89 Cubic Feet (2 rolls)
Physical Description:	0.67 Linear Feet
Language of the Material:	English
Abstract:	The Edward C. Light Schematic Drawings of the Hughes H-4 Hercules "Spruce Goose" Seaplane consists of blueline print reproductions of sheets created between 1941 and 1950 containing schematic engineering design drawings pertaining to the aircraft's rudder and flight control system assembly and installation. Types of drawings include full body perspective diagrams, structural sections, elevations, and plans.

Preferred Citation

Edward C. Light Schematic Drawings of the Hughes H-4 Hercules "Spruce Goose" Seaplane, 1941-1950. MS-00920. Special Collections and Archives, University Libraries, University of Nevada, Las Vegas. Las Vegas, Nevada.

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Biographical Note

Edward C. Light was an aeronautical engineer at the Hughes Aircraft Company (HAC) where he was responsible for supervising the design of aircraft control systems between 1942 and 1946. During this period, he worked on the Hughes H-4 Hercules, also known as the "flying boat" or the "Spruce Goose." As of March 2017, the plane has the longest wingspan of any flight-capable

aircraft. Later in his career, he returned to HAC in 1954-1955 as a research physicist working on the Falcon Guidance System.

In addition to working at HAC, Light worked as an engineer at the Glenn L. Martin Company (1938-1942), as an engineer (1946-1953) and as vice president (1955-1958) at the Summers Gyroscope Company, and as a research associate for the General Motors Research Space Group (1958-1960). He held several positions at Nortronics and the Northrop Space Laboratories between 1960 and 1977, including as an associate director of the Apollo tasks and as a director of research and development for tactical avionics. Light's area of expertise included aircraft instruments, stability and control of systems, instrument landing systems, autopilot design, radio and inertial navigation, electro-optical sensing systems, and guidance and control of missiles.

Light was born in 1917 in Liberal, Kansas, and graduated from the University of Minnesota in 1940 with a B.S. in Aeronautical Engineering. He was married four times and had seven children: Joanne, Edward, Susan, Greg, Todd, Michelle, and Brian. Light moved to Las Vegas, Nevada in 1975, and lived there until his death in 1992.

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Scope and Contents Note

The Edward C. Light Schematic Drawings of the Hughes H-4 Hercules "Spruce Goose" Seaplane consists of blueline print reproductions of seventeen sheets created between 1941 and 1950. These schematic engineering design drawings pertain to the Spruce Goose's rudder and flight control system assembly and installation. Types of drawings include full body perspective diagrams, structural sections, elevations, and plans.

The drawings document the Spruce Goose's pioneering "artificial feel system" in the control yoke for the ailerons, flaps, elevators, and rudder. Because of its enormous size, Hughes and his engineers developed an innovative hydraulic system to move the plane's control surfaces. A purely mechanical system would have required the combined strength of over 150 people to physically turn the controls. The artificial feel system enabled a pilot to control the plane and give him the sense that he was flying a smaller aircraft.

Source:

American Society of Mechanical Engineers, "Howard Hughes' Flying Boat 'Spruce Goose'." July 20, 2002. https://www.asme.org/wwwasmeorg/media/ResourceFiles/AboutASME/Who%20We%20Are/Engineering%20History/Landmarks/219-Howard-Hughes-Flying-Boat-HK-1.pdf

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Arrangement

Materials remain as they were received.

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Administrative Information

Access Note

Collection is open for research.

Publication Rights

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Acquisition Note

Materials were donated by Michelle and Brian Light in 2005; accession number 2019-021.

Processing Note

In 2019, as part of an archival backlog elimination project, Michelle Light wrote the finding aid description and Jimmy Chang rehoused and arranged the materials and entered the data into ArchivesSpace.

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Related Materials

Related Collections

The following resources may provide additional information related to the materials in this collection:

Bob McCaffrey Collection on the Save the Hughes Flying Boat Campaign, 1980-1983. MS-00693. Special Collections and Archives, University Libraries, University of Nevada, Las Vegas. Las Vegas, Nevada.

Howard Hughes Professional and Aeronautical Photographs, 1916-1997. PH-00321. Special Collections and Archives, University Libraries, University of Nevada, Las Vegas. Las Vegas, Nevada.

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Names and Subjects

- Aviation
- Hughes Flying-boat (Seaplane)
- Airplanes, Military
- schematic drawings
- assembly drawings

Collection Inventory

Title/Description	Containers
Screw: rudder, elevator aileron tab locking, 1944 July 01	roll 01
Head: control column casting, 1943 June 16	roll 01
Support assembly control system, 1944 January 29	roll 01
Perspective: power controls elevator, 1949 June 21	roll 01
Jack screw assembly: aileron artificial feel system, 1950 August 10	roll 01
Layout: elevator tab hydraulic change-over mechanics, 1943 October 20	roll 01
Sector assembly: flight deck flying tab, 1943 September 30	roll 01
Rudder pedal assembly, 1943 June 30	roll 01
Control column assembly, 1943 June 25	roll 01
Perspective installation - rudder controls complete, 1943 June 25	roll 01
Layout: control column; base and mounting bracket, 1943 November 20	roll 01
Perspective installation - elevator controls complete, 1948 February 25	roll 01
Final assembly, 1946 July 12 Scope and Contents Note: This sheet contains an index of mechanical component locations referencing some of the other sheets.	roll 01
Installation: rudder pedals, 1944 January 17	roll 01
Installation: control columns, 1944 May 17	roll 02

Physical Description: This sheet is 13 feet long.	
Installation: hull cabin flight controls, 1944 April 08 Physical Description: This sheet is 13 feet long.	roll 02
Installation: hull flight deck control over-systems, 1941 April 01 Physical Description: This sheet is approximately 20 feet long.	roll 02