
Descriptive Finding Guide for the Roland A. Boucher Personal Papers SDASM.SC.10020

Finding aid prepared by Alan Renga
San Diego Air and Space Museum Library and Archives
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Title: Roland A. Boucher Personal Papers

Identifier/Call Number: SDASM.SC.10020

Contributing Institution: San Diego Air and Space Museum Library and Archives

Language of Material: English

Physical Description: 0.36 Cubic feet1 Box, 12" x 5" x 10.5"

Date (inclusive): 1932-2014

Abstract: Roland A. Boucher, engineer and inventor who founded AstroFlights, which worked with electric-powered radio controlled aircraft and developed the world's first solar-powered aircraft. This is a collection pertaining photographs, slides, measurements, correspondence, articles on AstroFlight, Hughes Aircraft solar aircraft transparencies, two notebooks with technical notes, and a biography pertaining to Roland A. Boucher, inventor of the R/C car, the first air mobile satellite television transmission station, and the first solar-powered airplane.

Related Archival Materials note

Located in the SDASM library are books pertaining to major topics covered in this collection. They include:

Boucher, Robert J. (1979). The quiet revolution : the complete manual of electric propulsion systems. Call number: TT 154 .B58

Images from this collection have been digitized and placed on Flickr.

Conditions Governing Access note

The collection is open to researchers by appointment.

Conditions Governing Use note

Some copyright may be reserved. Consult with the library director for more information.

Preferred Citation note

[Item], [Filing Unit], [Series Title], [Subgroups], [Record Group Title and Number], [Repository "San Diego Air & Space Museum Library & Archives"]

Immediate Source of Acquisition note

The materials in this Collection were donated to the San Diego Air and Space Museum. The collection has been fully processed and is open for research with no restrictions.

Biographical/Historical note

Roland A. Boucher, engineer and inventor who founded AstroFlights, which worked with electric-powered radio controlled aircraft and developed the world's first solar-powered aircraft.

Roland A. Boucher (1932 -) was born July 12, 1932 in Windham County, Connecticut. He attended the University of Connecticut and graduated with a Bachelor's of Science, Electrical Engineering with distinctive honors in 1954, and also attended Yale University, graduating with a Master's of Science in Engineering in 1955.

When he graduated from Yale University, Boucher joined the Hughes Aircraft Corporation of Culver City, CA. He was assigned to coordinate the test and evaluation of the avionics equipment used on the F-106 first line fighter aircraft then in production. At the time, the reliability of the first two squadrons was so poor that deployment to active military bases was in doubt. Boucher was put in charge of a task force of engineers and technicians assigned to triple the in-flight time of the squadrons. Within ten years he rose to the position of Engineering Manager and was involved in the design of satellites for communications and navigation, during which time he developed an improved satellite camera for meteorological photographs. He then conceived, developed, and demonstrated the feasibility of satellite to aircraft communications at VHF frequencies. In 1968 Boucher developed the first air mobile satellite television transmission station, used in Columbia during the 1968 visit of Pope Paul VI and later in China during the 1972 Nixon Presidential visit.

He left employment with Hughes Aircraft Company in 1973 to form a company - Astro Flights, a manufacturer of products for electric-powered radio controlled aircraft, unmanned aerial vehicles, brushless industrial motors, the world's first solar-powered aircraft and the world's first practical electric radio controlled model airplane.. He conceived and designed the vehicle, which demonstrated the basic design feasibility in twenty-eight flights to five figure altitudes. All flights were powered solely by incident sunlight on the flying surfaces.

Astro Flight was awarded an DARPA contract through Lockheed in 1974 in order to build the Sunrise, the world's first solar-powered airplane. The historic flight, powered only by sunlight, took place November 4, 1974 at Fort Irwin, California. Two Astro Flight Astro 40 ferrite motors powered the craft via a 6:1 gearbox swinging a 36x24 wood propeller. More than one thousand solar cells on the wing were the sole source of energy, producing roughly 450 watts of power. The craft, weighing in at 27 pounds with its 32' wingspan, had a service ceiling of 20,000 feet (6,100 m) depending on available sunlight. 1975 saw both the departure of Roland Boucher and damage to Sunrise I in a windstorm. It also saw the

introduction of the improved Sunrise II, built in just three months. Its maiden flight was on September 27, 1975 at Nellis AFB. Improvements included a single Astro Flight Cobalt 40 motor powered by 4480 solar cells with an output of 600 watts. Climb rate was drastically improved at over 300 feet (91 m) per minute as was the estimated service ceiling of 75,000 feet (23,000 m), although actual flights did not exceed 20,000 feet (6,100 m) due to problems with both command and control. In 1975 he conceived and developed a radio controlled electric model car, and along with his wife, Nancy, formed Leisure Electronics to manufacture and market the product. Unsuccessful at first, it soon became a big hit with toy sellers throughout the nation.

In 2000 he was inducted into the Academy of Model Aviation (AMA) Model Aviation Hall of Fame.

 <https://www.flickr.com/photos/sdasmarchives/sets/72157633428343555>

Subjects and Indexing Terms

Boucher, Philip A., 1932-

Hughes Aircraft Company.

United States. National Aeronautics and Space Administration.

Nellis Air Force Base (Nev.)

Project Sunrise

Solar Aircraft

Box 01

Flight Books

Physical Description: 1. Record book of Astro Flight, book 2 2. Record book of Astro Flight, book 1

Folder 01 - Correspondence

Physical Description: 3. Correspondence to Roland Boucher from Starr J. Colby, February 26, 1979 4. Envelope addressed to Roland Boucher from Senate California Legislature Ross Johnson 5. Correspondence to Roland Boucher from Dave Brown, President AMA, August 1, 2000 6. Correspondence to Don Lowe, President AMA from Roland Boucher, July 9, 1990 7. Correspondence to Roland Boucher from John Worth, Executive Director Academy of Model Aeronautics, February 24, 1972

Folder 02 - Articles

Physical Description: 8. Article: "SSA in Action: How About A Solar-Powered Launch" 9. Biography of Roland Boucher 10. Biography AMA of Roland Boucher 11. Article: "Electric-Motor-Powered RPVs Studied for Battlefield Recon" 12. Article: "Boucher builds first solar powered model airplane", January 27, 1978 13. Article: "Electrical Propulsion for Control of Stationary Satellites" by Roland A. Boucher 14. Article: "Preliminary Design of a Solar-Electric Test Satellite" by Robert N. Olson and Roland A. Boucher 15. Article: "An Electric Record?" by Roland Boucher 16. Article: "Electric-powered R/C flying!"

Folder 03 - Packets and Information

Physical Description: 17. Packet: "Roland Boucher's Quiet Revolution (with table of contents) 18. Packet: "Roland Boucher's Quiet Revolution 19. Page: Astro Flight Inc. Pioneers in Silent Flight 20. Packet: "The MA-1 Reliability Task Force-A brief history of an attempt to triple the Reliability of the MA-1/F106 Aircraft" by Roland A. Boucher 21. Packet: Astro Flight Inc., Pioneers in Silent Flight "Project Sunrise" 22. Packet of SPRPV-3 Baseline Configuration

Folder 04 - Photographs and Images

Physical Description: 23. Photograph: First solar powered plane, spring 1974 three years after first flight 24. Photograph: Launch of solar powered plane 25. Photograph: Roland Boucher, 1976 26. Photograph: Roland Boucher with unidentified man 27. Photocopy of picture 28. Photograph of exhibit: 6' man looks at new intelsat IV (3 copies) 29. Photograph of Roland in front of exhibit 30. Photograph of two unidentified men in front of ATS Y-1 Spacecraft (2 copies) 31. Photograph of two unidentified men in front of ATS Y-1 Spacecraft (legs on cart) 32. Photograph of two unidentified men in front of ATS Y-1 Spacecraft (one man pointing) 33. Drawing and caption of Papal 'Courier' mobile satellite ground station 34. Photograph of two unidentified men in front of ATS Y-1 Spacecraft (one man pointing) 35. Photograph of Roland Boucher with two unidentified men 36. Photograph of Project Sunrise workers 37. Photograph of X-GDS-2 part 38. Photograph of Roland Boucher 39. Photograph of work station 40. Photograph of Roland Boucher and two unidentified men holding model plane 41. Photocopies of original contained photographs (15 copies) 42. Photocopies of original contained photographs (3 pages) 43. Photograph of Astro Flight workers around solar plane 44. Photograph of Roland Boucher and Astro Flight workers behind solar plane 45. Photograph of man behind solar plane 46. Photograph of four Astro Flight workers and solar plane 47. Photograph of two men working on solar plane 48. Photocopies of original contained photographs (2 pages) 49. Photograph of Solar Plane "Climb Out" 50. Photograph of two model airplanes with banner reading "Leisure Electric Power" 51. Photograph of four model airplanes 52. Photograph of model airplane 53. Photograph of "Solar Array"

Folder 05 - Envelope Negatives

Physical Description: 54. Contents of an envelope containing photograph negatives, prints, and receipts

Folder 06 - Slide Copies and Originals

Physical Description: 55. Original pages of contained slides (19 pages) 56. Photocopy of slide "Flight Trials with SPRPV- I°/IIΔ" 57. Photocopy of slide "Solar Energy Available" 58. Photocopy of graph: "Performance Estimates"

Folder 07 - Slides I

Physical Description: 59. Slide: "Project Sunrise: The World's First Solar Airplane" VG. No. 1 60. Slide: "Minimum Power Required for Level Flight" VG. No. 2 61. Slide: "Power as a Function of Relative Speed" VG. No. 3 62. Slide: "Power Required for Level Flight" VG. No. 3A 63. Slide: "Power Required for Level Flight vs Climb Rate" VG. No. 4 64. Slide: "Relative Power Required vs Altitude" VG. No. 5 65. Slide: "Propeller Selection" VG. No. 5A 66. Slide: "Solar Energy Available" VG. No. 6 67. Slide: "Baseline Design" VG. No. 8 68. Slide: "Weight Breakdown" VG. No. 9

Folder 08 - Slides II

Physical Description: 69. Slide: "Climb Power Margin vs Altitude" 70. Slide: "Climb Profile Launch Nellis AFB June 21 8am" 71. Slide: "Performance Estimates" 72. Slide: "Daily Flight Profile Demonstration Vehicle" VG. No. 12 73. Slide: "Flight Trials with SPRPV-I°/IIΔ" VG. No. 17 74. Slide: "First Solar-Powered RPV-SPRPV I" VG. No. 13 75. Slide: "Solar Array" VG. No. 15A 76. Slide: "Second Model" VG. No. 20 77. Slide: "17,000 ft and Climbing" VG. No. 21 78. Slide: "SPRPV-3 Baseline Configuration" VG. No. 22 79. Slide: "What Can Be Done to Improve Performance" VG. No. 23