

# University of Houston Clear Lake

## Archives and Special Collections

**HSF-61**

**David L. Eichblatt Papers**

[Human Space Flight Collection]

**Collection Number: HSF-61**

**Title:** David L. Eichblatt Papers

**Dates:** 1966-1997 (bulk 1966-1984)

**Creator:** David L. Eichblatt

### **Abstract**

The David L. Eichblatt Papers is composed of memos, correspondence, photographs, booklets, manuals, notes, maps, design plans, articles, scientific test information, scientific data, and miscellaneous materials, documenting the service of David L. Eichblatt at NASA Johnson Space Center from 1964 to 2009. Most of this collection consists of data Eichblatt collected as an engineer while he worked constructing, planning, and testing the aerodynamics on different spacecraft for NASA and the U.S. Air Force—mostly with the Space Shuttle orbiter program. During this period, he was in charge of the simulation programs for the testing of the Space Shuttle orbiters.

Eichblatt's projects included testing flights by comparing tire speeds, rollouts, landing, touchdowns, nose wheel contact, tail cone effects, number of engines, engine weights and fuel, parachutes, wings and parawing models, in different weather conditions, runway conditions, and different gravity effects for spacecraft and aircraft used by NASA. The collection contains study booklets prepared by Eichblatt, such as a take-off and landing performance study for the space shuttle orbiter vehicle in 1970, with data collection and hand-drawn aircraft information in them. There are materials documenting Eichblatt's role in the simulation programs for the Shuttle, including the landing dynamics program, which simulated orbiter separation and derotation of the Shuttle orbiter following touchdown through nose wheel contact. There are research materials on the feasibility for the use of the modified Boeing 747 Shuttle Carrier Aircraft (SCA) to transport the Shuttle orbiter in the 1970s.

The collection includes a set of photographs, a hand drawing, and data collection used by Eichblatt during his role in testing for a lunar motorcycle between 1969 and 1970. The collection also includes a set of rare, square photographic prints documenting his involvement in the Australian landing sites evaluation and survey with the Assured Crew Return Vehicle (ACRV) in 1993. This was part of the U.S. and Russia examining whether Russia's Soyuz spacecraft could serve as stop-gap lifeboat spacecraft as NASA was designing a lifeboat for use for their planned Space Station Freedom. These are very unique images of an international NASA partnership

with Australian space exploration personnel. The collection has an article, landing observations information, meeting agendas, photographs, documents, English-Russian translations, and letters, from Eichblatt's role as leader of NASA team of four Americans and one Australian to Russia and Kazakhstan to observe the landing and recovery of the Soyuz TM-16 crew and capsule.

**Extent** 3.2 linear feet

**Language(s):** English, Russian

### **Repository**

University of Houston-Clear Lake Archives and Special Collections, Alfred R. Neumann Library, 2700 Bay Area Blvd., Houston, TX 77058-1002

**Restrictions on Access:** There are no known restrictions on accessing this collection.

### **Restrictions on Use**

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### **Preferred Citation**

[Item name or title], [Box Numbers], [Folder Numbers], David L. Eichblatt Papers, HSF-61, University of Houston-Clear Lake Archives and Special Collections, Alfred R. Neumann Library, 2700 Bay Area Blvd., Houston, TX 77058-1002

## **Acquisition**

The collection was donated to the University of Houston-Clear Lake Archives and Special Collections by David L. Eichblatt in April 2013.

**Processed by:** Elizabeth Lira and Matthew M. Peek, November 2022-March 2023.

## **Arrangement**

The collection is arranged by purpose and topic of the materials in folders, based on Eichblatt's original structure of folders, with loose chronological order within series where possible. The collection is organized into the following seven series: Series I: Space Shuttles Materials; Series II: Lunar Motorcycle; Series III: MSC Orbiter 040A Materials; Series IV: 747 Shuttle Carrier Materials; Series V: Landing Site Assured Crew Return Vehicle Materials and Photographs; Series VI: Soyuz TM 16 Materials and Photographs; and Series VII: Miscellaneous Materials.

## **Biographical Note**

David Lynn Eichblatt (who goes by "Dave") attended college at Texas A&M University from 1958 to 1962, receiving his BS degree in aeronautical engineering. After college, he served in the U.S. Army as a field artillery officer from September 1962 to September 1964. David Eichblatt became an engineer at the NASA Manned Spacecraft Center (later Lyndon B. Johnson Space Center) starting in November 1964. Eichblatt began in the Flight Crew Support Division, working with training Gemini astronauts. He would later move to the Manned Spacecraft Center's Engineering Directorate, where he worked on multiple aspects and projects including the Apollo and Shuttle Programs.

Some notable aspects of Eichblatt's time at NASA includes his work with wind tunnel testing, designing for various space flight vehicles, and analysis work you conducted specifically for the Space Shuttle Program. As an example of his work, Eichblatt redesigned the inlets on the Northrop T-38 Talon aircraft for the U.S. Air Force to improve its take-off performance. He also worked on the Space Shuttle missions STS-1, STS-2, and STS-3. He would continue working in Shuttle Program through the 1980s, preparing documentation, assessments, and presentations to support simulation projects with the STS-9. He was in charge of the simulation programs for the testing of the Space Shuttles. Eichblatt was assigned for overseas projects such as the Australian Landing Sites Evaluation and Survey with the Assured Crew Return Vehicle.

In July 1993, Eichblatt led a NASA team of four Americans and one Australian to Moscow, Russia, and onto Dzhezkazgan, Kazakhstan to observe the landing and recovery of the Soyuz TM-16 crew and capsule. His team were the first Americans and Australian to witness a Soyuz landing and recovery. Soyuz TM-16 was the 16th expedition to the Russian Space Station Mir. David Eichblatt retired from NASA Johnson Space Center between May and June 2009. At the time of this writing, Eichblatt lives in the Clear Lake City area of coastal Houston, Texas.

## Scope and Content

The collection is composed of memos, correspondence, photographs, booklets, manuals, notes, maps, design plans, articles, scientific test information, scientific data, and miscellaneous materials, documenting the service of David L. Eichblatt at NASA Johnson Space Center from 1964 to 2009. Most of this collection consists of data Eichblatt collected as an engineer while he worked constructing, planning, and testing the aerodynamics on different spacecraft for NASA and the U.S. Air Force—mostly with the Space Shuttle orbiter program. Eichblatt was involved in the planning and testing for Space Shuttle orbiter vehicles used for STS-1, STS-2, STS-3, MSC 040A, in the 1970s and 1980s. He also worked on a mini-Shuttle concept in 1970, and the Shuttle Carrier Aircraft/Orbital Vehicle (SCA/OV) modified Boeing 747 piggyback carrier aircraft. He was in charge of the simulation programs for the testing of the Space Shuttle orbiters.

Eichblatt's projects included testing flights by comparing tire speeds, rollouts, landing, touchdowns, nose wheel contact, tail cone effects, number of engines, engine weights and fuel, parachutes, wings and parawing models, in different weather conditions, runway conditions, and different gravity effects for spacecraft and aircraft used by NASA. The collection contains study booklets prepared by Eichblatt, such as a take-off and landing performance study for the space shuttle orbiter vehicle in 1970, with data collection and hand-drawn aircraft information in them. There are materials documenting Eichblatt's role in the simulation programs for the Shuttle, including the landing dynamics program which simulated orbiter separation, and derotation of the Shuttle orbiter following touchdown through nose wheel contact. There are research materials on the feasibility for the use of the modified Boeing 747 Shuttle Carrier Aircraft (SCA) to transport the Shuttle orbiter in the 1970s.

The collection includes a set of photographs, a handmade drawing, and data collection used by Eichblatt during his role in testing for a lunar motorcycle between 1969 and 1970. involvement in the Australian landing sites evaluation and survey with the Assured Crew Return Vehicle (ACRV) in 1993. This was part of the U.S. and Russia examining whether Russia's Soyuz spacecraft could serve as stop-gap lifeboat spacecraft as NASA was designing a lifeboat for use for their planned Space Station Freedom. These are very unique images of an international NASA partnership with Australian space exploration personnel. The collection has an article, landing observations information, meeting agendas, photographs, documents, English-Russian translations, and letters, from Eichblatt's role as leader of NASA team of four Americans and one Australian to Russia and Kazakhstan to observe the landing and recovery of the Soyuz TM-16 crew and capsule.

The collection is arranged into the following series based on subject and purpose of the materials: Series I: Space Shuttles Materials; Series II: Lunar Motorcycle; Series III: MSC Orbiter 040A Materials; Series IV: 747 Shuttle Carrier Materials; Series V: Landing Site Assured Crew Return Vehicle Materials and Photographs; Series VI: Soyuz TM 16 Materials and Photographs; and Series VII: Miscellaneous Materials.

## **Subject Terms**

### **Personal/Family Name**

Eichblatt, David L. (David Lynn)

### **Corporate Names**

Lyndon B. Johnson Space Center  
Rockwell International. Space Division  
Rockwell Space Operations Company  
United States. National Aeronautics and Space Administration

### **Geographic Name**

Houston (Tex.)  
Kazakhstan  
Russia (Federation)

### **Topical Term**

Apollo Soyuz Test Project  
Boeing 747 (Jet transports)  
Manned Spacecraft Center (U.S.)  
Soyuz spacecraft  
Space Shuttle Program (U.S.)

### **Genre/Physical Characteristic**

Booklets  
Correspondence  
Handbooks  
Memorandums  
Operating manuals  
Photographs  
Publications  
Technical reports

## **Collection Inventory**

### **Series 1: Space Shuttles Materials**

Series I consists of reports, notes, correspondence, documents, scientific data, technical manuals, and booklets used by David Eichblatt while working as an engineer with the National Aeronautics and Space Administration at Johnson Space Center. The materials document the

data for the Space Shuttle program. The materials are in chronological order with the bulk of the series focusing on STS-1 and at the end of the series with STS-2, STS-3, and STS-9.

<b>Box/Folder</b>	<b>Description</b>	<b>Date</b>
1/1	Limp Parawing Tests and Drop Tests	November 1966, March-April 1967
1/2	Spoilers	1966, January 1967, September 1969, January 1970
1/3	Nylon Webbing Material Tests	January 1968, March 1968
1/4	Parawing Scale Factors	August 1968, December 1968, August 1969
1/5	Parachute Data	May 1969, September 1971
1/6	Configuration and Stability	July-August 1969
1/7	Weight Tradeoffs Fans, Preliminary Data Reports	September 1969
1/8	Landing and Takeoff Performance, Weight on Field, Engine Cant Angle on Runway Length	October-December 1969, February-April 1970
1/9	Reentry Guidance, Longitudinal Stability	December 1969, February 1970, February 1971, June-July 1971
1/9	Takeoff and Landing Studies and Data	1969-1970
1/10	Mini Shuttle	March 1970
1/11	Takeoff and Landing Performance Study	March 1970
2/1	Engine and Fuel Data and Performance	March-April 1970

2/2	Aircraft Comparison for Simulation	April 1970
2/3	Gliding Flight Equations	April 1970
2/4	Wing Comparison Study, Aspect Ratio Study, No Flap Aerodynamics	April-June 1970
2/5	Elevator Deflections	May 1970
2/6	Wet Runway Landing Performance	May 1970
2/7	Jet Engine	June 1970
2/8	Landing for Runway Length	March 1971
2/9	Horizontal and Vertical Flight Tests	May 1971, July 1971
2/10	Wing Design	May 1971, August 1971, October 1971
2/11	Rocket Extraction Escape System	June 1971
2/12	Linearized Lateral-Directional Equations of Motion	July 1971
2/13	Flyback Range Capability Space Shuttle Booster	July 1971, March 1973
2/14	Flight Envelope, Subsonic and Trimmed Aerodynamics	March 1972
2/15	Air Breathing Engine	October-November 1972
2/16	Shuttle Window Field of View	January 1973, undated
3/1	Takeoff Distance Study, 6 Engine Performance	August-September 1973
3/2	Internal Letters Rockwell International on Landing	October 1973, April 1974, July 1974, August 1974
3/3	Landing Simulation Studies, Mechanical Systems Management Panel	January, July, September-December 1974, January-February 1975

3/4	Lead/Lag Filter, Corridors	April, August 1974
3/5	Sequence Mass Properties Statements, RTLS Abort Study, SSFS Model Documentation	April 1974, June 1974, September 1974, undated
3/6	Landing Rollout and Slapdown Program	July 1974
3/7	Flight Control System Software and Hardware	September 1974
3/8	Block Diagram, Rudder and Nosewheel Channels	September 1974
3/9	Aircraft Tires, Tire Loads, Landing Rollout and Slapdown, Tire Capability	September 1974, November-December 1974, March 1975, August 1975
3/10	Nosewheel Touchdown-Rollout Simulation, Delayed Nosewheel Landing Rollout	February-March 1975
3/11	Presimulation Report, Approach and Landing Software and Display 1	March 1975
3/12	Engineering Simulator, Landing and Rollout Phase	April 1975
3/13	Nose Gear Strut, Brakes, Runway Flooding, Deceleration Performance	May 1975, September 1975, January 1976
3/14	Pilot Report Orbiter Handling Qualities	June 1975
3/15	Landing Gear Deployment Design, Door Opening	July 1975
3/16	Tailcone on Landing Studies, Drag Parachute with Tailcone	September-November 1975, November 1976
4/1	Winds in Gliding Flight, Parachute in Wind, Autoland Support Program	January-March 1976
4/2	Autoland Design, Landing Dynamics Program, Rollouts and Slapdowns Nosewheel Gear	March 1976-October 1977
4/3	Approach and Landing Test	July 1976, November-December 1977
4/4	Revision to the Data Tapes	September 1976



4/5	Landing Gear Loads, Orbiter Performance, Air Data Calibrations, Force Coefficient Extraction, Lift to Drag Uncertainties	May 1977, December 1977, January 1978, April 1978
4/6	DAP Data Extraction Program	August 1977
4/7	Landing Studies, Data Collection, and Materials	1978-1981
5/1	Entry Program Notes	January-February 1979
5/2	Aimpoints and Threshold Approach and Landing	March 1979
5/3	Correlation of Flight and Predicted Performance Data	April 1979
5/4	Performance Calculations from Flight	May 1979
5/5	Wind Studies for Shuttle Mission Simulator	July 1979, November 1981, February 1982, May 1982, May 1983, August 1983
5/6	Static Check	March 1981
5/7	Center of Gravity Data	March 1981
5/8	Operational Flight Profile, Preliminary Flight Results, Tabulated Entry Trajectory Parameters	April-September 1981
5/9	H/b Study Touchdown and Landing	May 1981
5/10	Aerodynamic Data for STS-2 Verification	June 1981
5/11	STS-2 Flight Data	November-December 1981
6/1	STS-3 Mission Chart and Flight Dates	January 1982, April 1982
6/2	Uncertainties and Flight Test Verification	August 1982
6/3	Operations Manual	March 1984
6/4	Last Ditch Options for Crew	May 1984
6/5	STS-9 Flight Assessment	July 1984

6/6	Nose Wheel Steering Diagram	December 1985
6/7	STS-9 Materials, Presentation Slides Entry Flight Control System Briefing	1981-1985
6/8	STS-27 Solar Position at Orbiter Landing Sites	January 1989
6/9	Angle of Attack from Normal Acceleration Flight Measurements	Undated
6/10	Landing Pitch-Over and Rollout Status	Undated
6/11	Mathematical Model for Parachute Payload System	Undated
6/12	Performance Digital Computer Program	Undated
6/13	Wing Design Study	Undated
6/14	Miscellaneous, Space Shuttle Study and Data Materials	Undated

## **Series 2: Lunar Motorcycle**

Series II consists of memorandums and photographs documenting test and study information for Harold Johnson's 1/6 RIG of the lunar motorcycle, on which David Eichblatt was involved in the testing for the motorcycle between 1969 and 1970.

<b>Box/Folder</b>	<b>Description</b>	<b>Date</b>
6/15	Lunar Motorcycle Studies, Tests, and Diagrams	May 1969, September 1969, April 1970
6/16	Harold Johnson's 1/6 RIG Photographs	Undated

## **Series 3: MSC Orbiter 040A Materials**

Series III consists of memorandums with test information, scientific data, and study material on the NASA Manned Spacecraft Center Orbiter 040A, dealing with its functions and performance.

<b>Box/Folder</b>	<b>Description</b>	<b>Date</b>
6/17	Vertical Tail Optimization	March 1971
6/18	Shuttle Configuration, Orbiter Subsonic Performance, Linearized Lateral-Directional Equations of Motion	June-September 1971
6/19	Ferry Design, Engine and Fuel	September, November

		-December 1971
7/1	Hypersonic, Wing Dihedral Effect	December 1971, January 1972
7/2	Results of Preliminary Flying Qualities, Lateral Directional Derivation Requirements, Vertical Tail	January, March, July 1972
7/3	Data Tape	April 1972
7/4	Transmittal of MSC 049 Shuttle	June 1972
7/5	Sensitivity to Static Margin	August 1972

#### **Series 4: 747 Shuttle Carrier Materials**

Series IV consists of correspondence, scientific data, study material, and Boeing handbooks, on the Boeing 747 Shuttle Carrier Aircraft (SCA), which was the modified Boeing 747 airliner that NASA used to transport Space Shuttle orbiters. The materials are dealing with the carrier's functions, performance, and flying capabilities as NASA Johnson Space Center worked on testing the feasibility of ferrying full-sized Shuttle orbiters on the back of a modified aircraft to Shuttle launch location. All of the materials date between 1973 and 1975.

<b>Box/Folder</b>	<b>Description</b>	<b>Date</b>
7/6	Ferry Flying Mission Studies	June-December 1973, April 1974
7/7	Performance Estimates and Reports	November-December 1973
7/8	Feasibility Study	March 1974
7/9	Feasibility Study	May 1974
7/10	Wind Tunnel Summary Report	June 1974
7/11	Tail Cone On vs Off	September 1974
8/1	Ferry Performance	December 1974
8/2	Program Review, Separation	December 1974
8/3	Landing Performance	January 1975
8/4	Modification Preliminary Flying Qualities	January 1975

### **Series 5: Landing Site Assured Crew Return Vehicle Materials and Photographs**

Series V consists of a booklet, photographs, and 35mm negatives, documenting David Eichblatt's role in the trip to Australia related to the United States and Russia's development of the Assured Crew Return Vehicle (ACRV). After the 1986 *Challenger* disaster, NASA formed plans for a Space Station Freedom, a NASA project to construct a permanently crewed Earth-orbiting space station, to have a lifeboat to allow for astronauts to escape safely from the future planned space station. In 1992, the U.S. and Russia examined whether Russia's Soyuz spacecraft could serve as stop-gap until the NASA lifeboat could be completed. In 1992, NASA and Russian engineers traveled to Australia to find a place for the Soyuz lifeboat to land.

<b>Box/Folder</b>	<b>Description</b>	<b>Date</b>
8/6	ACRV Evaluation and Survey	June 1993
8/7	ACRV Australian Landing Sites Photographs	November 1992

### **Series 6: Soyuz TM-16 Materials and Photographs**

Series VI consists of a booklet, handwritten notes, maps, scientific data, and photographs, as part of the observations related to landing site for the Soyuz TM-16, the sixteenth expedition to the Russian Space Station Mir. The materials were kept by Eichblatt due to his role as the leader of the NASA team of four Americans and one Australian to Russia and Kazakhstan, who observed the landing and recovery of the Soyuz TM-16 crew and capsule. Some material is in Russia with an English translation in separate documents. The photographs in this series are extremely unique, fully-square photographic prints that show the two countries' engineers during the site surveying process for landing sites.

<b>Box/Folder</b>	<b>Description</b>	<b>Date</b>
9/1	Soyuz TM-16 Landing Observation and Crew Activities	July-November 1993
9/2	Soyuz TM-16 Landing Observation Report Draft	November 1993
9/3	Soyuz TM-16 Landing Observation Report Unbound and Photograph Description	November 1993
9/4	Soyuz TM-16 Landing Observation Photographs	Undated

### **Series 7: Miscellaneous Materials**

Series VII consists of different aerodynamic studies and scientific data created, used, or kept by David Eichblatt for a variety of projects and purposes. Most of the materials were kept in folders

with basic titles, but no explanation for the work or the projects featured in the materials. One folder contains research information from 1972 on the Martin Marietta X-24, which was an experimental aircraft developed from a joint U.S. Air Force and NASA program named PILOT. The aircraft was designed and built to test lifting body concepts, experimenting with the concept of unpowered reentry and landing that would later be used by the Space Shuttle orbiter.

One folder has material related to the redesign project for the U.S. Air Force's Northrop T-38 two-seat, supersonic trainer. This aircraft was used by NASA Dryden Flight Research Center's research pilots for proficiency and mission support flights. The "Landing Studies" folder was originally organized in its own folder and consisting of different projects. As a result, the folder's materials was kept together as it was. This series is organized in chronological order with the exception of the last folder.

<b>Box/Folder</b>	<b>Description</b>	<b>Date</b>
9/5	Take Off Distance Studies	October 1961
9/6	Unwritten Laws of Engineering	April 1968
9/7	Parawing Structural Integrity Studies	February 1969
9/8	Flare and Landing X-24 Lifting Body	July 1972
9/9	Intern Annual Training Report	September 1973, August 1974
9/10	Flight Tests T-38N Redesign Project	July 1997
9/11	Landing Studies	Various dates