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## FINDING AID TO THE LANA MURPHY COUCH PAPERS, 1953-1997

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## Descriptive Summary

<b>Creator Information</b>	Couch, Lana Murphy, 1941-2007
<b>Title</b>	Lana Murphy Couch papers
<b>Collection Identifier</b>	MSA 312
<b>Date Span</b>	1953-1997, predominant 1970-1995
<b>Abstract</b>	Technical reports, writings, research & work reports, correspondence, photographs, VHS tapes, and material related to award recognition, which document the forty-year NASA career of Lana Murphy Couch.
<b>Extent</b>	1.4 cubic feet (4 mss. boxes)
<b>Finding Aid Author</b>	Mary A. Segó, 2015
<b>Languages</b>	English
<b>Repository</b>	Virginia Kelly Karnes Archives and Special Collections Research Center, Purdue University Libraries

## Administrative Information

<b>Location Information:</b>	ASC-R
<b>Access Restrictions:</b>	Collection is open for research
<b>Acquisition Information:</b>	Donated by
<b>Accession Number:</b>	
<b>Preferred Citation:</b>	MSA 312, Lana Murphy Couch papers, Karnes Archives and Special Collections, Purdue University Libraries
<b>Copyright Notice:</b>	Purdue University

## **Subjects and Genres**

### **Persons**

Couch, Lana Murphy, 1941-2007

### **Organizations**

NASA Langley Research Center

NASA Headquarters

Purdue University. School of Aeronautics and Astronautics

### **Topics**

Purdue University--Alumni and alumnae

Wind tunnels

Wind tunnels Design and construction

### **Form and Genre Types**

Correspondence

Newsletters

Papers

Photographs

Programs

Publications

Research & work reports

Technical reports

VHS <sup>TM</sup>

Writings

### **Occupations**

Aeronautical engineering

Wind tunnel test engineer

## Biography of Lana Murphy Couch

Lana Murphy Couch was born in Smiths Grove, Kentucky on Nov. 27, 1941. She was the only child of Floyd W. and Fanny C. Murphy. Couch moved to Martinsville, Indiana in the early 1950s. She was a 1963 graduate of Purdue University with a degree in aeronautical engineering.

Couch was employed by NASA, Langley Research Center in Hampton, Va. and NASA, Headquarters in Washington, DC from 1963 through 2003. She started her career as a wind tunnel test engineer and advanced through a series of increasingly responsible technical and management positions to retire in 2003 as the Associate Director for Business Management at NASA Langley Research Center.

She was a member of the Senior Executive Service and a Purdue University Distinguished Engineering Alumnus. Couch was a Fellow of the American Institute for Aeronautics and Astronautics, and a member of the American Society of Mechanical Engineers. She was the holder of several U. S. and international patents for improvements to wind tunnel design and was the author of many technical papers. She was also the recipient of numerous technical and management awards for her contributions to NASA and to aeronautical sciences including the NASA Exceptional Service Medal, the NASA Exceptional Achievement Medal, and the NASA Equal Employment Opportunity Medal.

Lana Murphy Couch passed away on April 22, 2007.

### *Sources:*

*NASA News*, excerpted from the *Daily Press* on April 24, 2007.

## Collection Description

### Scope

The Lana Murphy Couch papers (1953-1997; 1.4 cubic feet) document Couch's forty year career with NASA, first as a wind tunnel test engineer, and later in management positions. Types of materials include: correspondence, newsletters, papers, photographs, programs, publications, research & work reports, technical reports, VHS™ tapes, writings, and material related to award recognition.

The papers are organized into four series, and are arranged in chronological order within each.

### Arrangement

- 1. Writings and Publications, 1966-1980 (0.4 cubic feet).** Contained within this series are NASA technical reports, memoranda, and notes, along with conference papers, articles, and working papers that Couch authored or co-authored.
- 2. Printed Material, 1953-1986 (0.6 cubic feet).** The printed material consists of a 1953 National Advisory Committee for Aeronautics document with equations, tables, and charts for compressible flow. Also included is a collection of research related to wind tunnels, Scramjet technology, hypersonic aircraft, and a paper titled, "Flight Research Vehicle to Bridge Shuttle and Hypersonic Aircraft Technology."
- 3. Audio Visual Material, 1985 (0.2 cubic feet).** This series is comprised of two tapes containing footage of the House Subcommittee on Transportation, Aviation and Materials on High Speed Aeronautics with testimony from Dr. Raymond Colladay, Aeronautics and Space technician, NASA, July 24, 1985
- 4. "Personal File," – Photographs, Correspondence, and Newsletter Articles, 1974-1997 (0.4 cubic feet).** The items in this series were found in a file labeled, "Lana Couch – Personal File," so items were left as originally grouped. Much of the material is photographs, correspondence, letters of congratulations, and newsletter articles in regards to awards Couch received; nomination recognition for the Federal Woman's Award in 1974; NASA Exceptional Service Medal, and National Aviation Club, "Women in Aviation," both received in 1986; NASA's Group Achievement Award on behalf of the National Aero-Space Plane Program Team in 1988; and election to Fellow of the AIAA, 1997. Also found in the file is printed material in recognition of her contributions to United States Patent, 4,485,670, "Heat Pipe Cooled Probe," in 1985. Lastly, there is a document titled, "Some Thoughts on Future Directions for the Space Systems Division," by Walter B. Olstad, July 31, 1978.

## **Descriptive Rules**

Describing Archives: A Content Standard

## **Processing Information**

All materials have been housed in polyester sleeves acid-free folders, and acid-free boxes. All series are arranged in chronological order.

## DETAILED DESCRIPTION OF THE COLLECTION

### Series 1. Writings and Publications, 1966-1980

(0.4 cubic feet)

#### Box 1 *Writings and Publications, 1966-1980*

##### Folder

1. Couch, L. C.; Stallings, R. L. Jr.; Collins, I. K. (1966 December). Heat-Transfer Measurements on a Flat Plate With Attached Protuberances in a Turbulent Boundary Layer at MACH Numbers of 2.49, 3.51, and 4.44. NASA TN D-3736. Washington, DC: National Aeronautics and Space Administration.
2. Morris, W. D.; Couch, L. M. (1968 April). Experimental Pressure Distributions on a Blunt Lifting-Entry Body at MACH 3.71. NASA TN D-4494. Washington, DC: National Aeronautics and Space Administration.
3. Couch, L. M. (1969 July). Flow-Field Measurements Downstream of Two Protuberances on a Flat Plate Submerged in a Turbulent Boundary Layer at MACH 2.49 and 4.44. NASA TN D-5287. Washington, DC: National Aeronautics and Space Administration. (2 copies)
4. Couch, L. M. (1972). Transonic Wall Interference Effects on Bodies of Revolution; AIAA 7<sup>th</sup> Aerodynamic Testing Conference, Palo Alto, California, September 13-15, 1972. New York, New York: American Institute of Aeronautics and Astronautics. (3 copies)
5. Couch, L. M.; Brooks, C. W. Jr. (1973 November). Effect of Blockage Ratio on Drag and Pressure Distributions for Bodies of Revolution at Transonic Speeds. NASA TN D-7331. Washington, DC: National Aeronautics and Space Administration.
6. Couch, L. M. (1975 February). Drag and Stability Characteristics of a Variety of Reefed and Unreefed Parachute Configurations at MACH 1.80 with an Empirical Correlation for Supersonic MACH Numbers. NASA TR R-429. Washington, DC: National Aeronautics and Space Administration.
7. Nugent, J.; Couch, L. M.; Webb, L. D. (1975 March). Exploratory Wind Tunnel Tests of a Shock-Swallowing Air Data Sensor at a MACH Number of Approximately 1.83. TM X-56030. Edwards, California: NASA Flight Research Center.
8. Couch, L. M. (1975 May). Effects of Geometric Variables on the Performance of a Probe for Direct Measurement of Free-Stream Stagnation Pressure in Supersonic Flow. NASA TN D-7887. Washington, DC: National Aeronautics and Space Administration. (includes additional graphs)
9. Couch, L. M. (1975). Geometric Optimization of the Supersonic Stagnation-Pressure Probe; Presented at the Instrument Society of America 21<sup>st</sup> International Instrumentation Symposium, Philadelphia, PA, May 19-21, 1975. (2 copies)
10. Meyers, J. F.; Couch, L. M.; Feller, W. V. (1975). Laser Velocimeter Measurements in a Large Transonic Wind Tunnel; Presented at the

11. Symposium on Laser Anemometry, Bloomington, MN, October 22-24, 1975  
Couch, L. M. (1976). Geometric Optimization of the Supersonic Stagnation-Pressure Probe. Reprinted from ISA Transactions, Volume 15, Number 1. (2 copies)
12. Couch, L. M.; Wieting, A. R. (1979). Capability for Aerothermal-Structural Tests of Large-To-Full-Scale Components of Future Space Transportation Systems. Presented at the AIAA Conference on Advanced Technology for Future Space Systems, May 8-11, 1979, Langley Research Center, Hampton, Virginia.
13. Camarda, C. J.; Couch, L. M.; Kelly, H. N. (1980). Heat Pipes Cool Probe and Sandwich Panel. *NASA Tech Briefs*, Winter, 1980.
14. Couch, L. M. "A New Approach to Providing Additional MACH Number Capacity for the 8-FT. HTST," Thermal Structures Branch, undated
15. Stallings, R. L. Jr.; Couch, L. M.; Tudor, D. H. Langley Working Paper, "Experimental Pressure Distributions on a 120° Cone at MACH Numbers from 2.96 to 4.63 and Angles of Attack from 0° to 20°, undated

## Series 2. Printed Material, 1953-1986

(0.6 cubic feet)

### Box 2 Printed Material, 1953-1982

#### Folder

1. National Advisory Committee for Aeronautics, Ames Research Center. (1953). Equations, Tables, and Charts for Compressible Flow. Washington, DC: Government Printing Office. 1953 (2 copies)
2. Schaefer, W. T. Jr. (1965). Characteristics of Major Active Wind Tunnels at the Langley Research Center. NASA TM X-1130. Washington, DC: National Aeronautics and Space Administration.
3. "Historical Aspects of NASA Scramjet Technology Development," by E. A. Mackley, circa early 1970s
4. Hypersonic Research Facilities Study, Volume I, Summary, prepared under Contract No. NAS2-5458 by Advanced Engineering at McDonnell Aircraft Company for OART – Advanced Concepts and Missions Division, NASA, Moffett Field, California, October 1970
5. Hunt, J. L.; Talcott, N. A. Jr.; Cabbage, J. M. (1977). Scramjet Exhaust Simulation Technique for Hypersonic Aircraft Nozzle Design and Aerodynamic Tests. Hampton, Virginia: NASA Langley Research Center.
6. Talcott, N. A. Jr. (1977). Thermodynamic Properties of Gaseous Fluorocarbons and Isentropic Equilibrium Expansions on Two Binary Mixtures of Fluorocarbons and Argon. NASA TN D-8405. Washington, DC: National Aeronautics and Space Administration.
7. Draper, A. C.; Lane, P. Jr.; Zima, W. P. (1977). A Flight Research Vehicle to Bridge Shuttle and Hypersonic Aircraft Technology. Wright-Patterson Air Force Base, OH: Air Force Flight Dynamics Laboratory. (printed in AIAA



- 1977 AFM Conference, August 8-10, 1977
8. Talcott, N. A. Jr.; Hunt, J. L. (1977). Streamtube Analysis of a Hydrogen-Burning Scramjet Exhaust and Simulation Technique. Reprinted from *Journal of Aircraft*, Vol. 14, No. 9, September 1977, pp. 918-920.
  9. Talcott, N. A. Jr.; Hunt, J. L. (1977). Calculated Heating on the Afterbody Nozzle of a Hypersonic Aircraft Concept. Reprinted from *Journal of Aircraft*, Vol. 14, No. 12, December 1977, pp. 1247-1248.
  10. Talcott, N. A. Jr. (1978). Flow Field Visualization About External Axial Corners. NASA TM-78682. Hampton, Virginia: NASA Langley Research Center.
  11. Weidner, J. P. (1978). The Application of Dual Fuel (JP-LH2) for Hypersonic Cruise Vehicles. Reprinted from *Journal of Aircraft*, Vol. 15, October 1978, pp. 686-691.
  12. Weidner, J. P. (1979). Conceptual Study of a Turbojet/Ramjet Inlet. NASA TM-80141. NASA Scientific and Technical Branch.
  13. Beach, H. L. Jr. (1979). "Hypersonic Propulsion," NASA Conference Publication 2092, Aeropropulsion 1979, Proceedings of a Conference held at NASA Lewis Research Center, Cleveland, Ohio, May 15-16, 1979
  14. Small, W. J.; Riebe, G. D.; Taylor, A. H. "Aerodynamics of a Turbojet-Boosted Launch Vehicle Concept," Presented at the AIAA 18<sup>th</sup> Aerospace Science Meeting, Pasadena, CA, January 14-16, 1980
  15. Weidner, J. P. "Propulsions/Airframe Integration Considerations for High Altitude Hypersonic Cruise Vehicles," Presented at the AIAA 18<sup>th</sup> Aerospace Sciences Meeting, Pasadena, CA, January 14-16, 1980
  16. Vahl, W. A.; Weidner, J. P. (1980). A Preliminary Assessment of the Impact of 2-D Exhaust-Nozzle Geometry on the Cruise Range of a Hypersonic Aircraft With Top-Mounted Ramjet Propulsion. NASA TM -81841. NASA Scientific and Technical Information Branch.
  17. Pittman, J. L.; Riebe, G. D. (1980 December). Experimental and Theoretical Aerodynamic Characteristics of Two Hypersonic Cruise Aircraft Concepts at Mach Numbers of 2.96, 3.96, and 4.63. NASA TP-1767, NASA Scientific and Technical Information Branch.
  18. Talcott, N. A. Jr. (1981, May). The Use of Interactive Graphic Displays for Interpretation of Surface Design Parameters. NASA Technical Memorandum 81963. NASA Scientific and Technical Information Branch.
  19. Rieble, G. D.; Small, W. J.; Morris, O. A. (1981 July). Aerodynamic Tests and Analysis of a Turbojet-Boosted Launch Vehicle Concept (Spacejet) Over a Mach Number Range of 1.50 to 2.86. NASA Technical Paper 1888. NASA Technical Memorandum 81963. NASA Scientific and Technical Information Branch.
  20. Heldenfels, R. R. "Some Historical Perspectives on Thermostructural Research at the NACA Langley Aeronautical Laboratory, 1948-1958," presented at Symposium on Computational Aspects of Heat Transfer in Structures, Langley Research Center, Hampton, Virginia, November 3-5, 1981
  21. Talcott, N. A. Jr. (1982). Computer Graphics Display Technique for the

- Examination of Aircraft Design Data. Reprinted from *Journal of Aircraft*, Volume 19, Number 1, January 1982, pp. 76-80.
22. Hunt, J. L.; Johnston, P. J.; Cabbage, J. M., et. al. (1982). Hypersonic Airbreathing Missile Concepts Under Study at NASA Langley Research Center. AIAA 20<sup>th</sup> Aerospace Sciences Meeting, January 11-14, 1982, Orlando, Florida.
  23. Wieting, A. R. "Modification of 8 Foot High Temperature Tunnel to Provide a Unique National Research Facility for Hypersonic Air-Breathing Propulsion Systems," "Proposed LaRC FY 85 CoF," prepared September 1982
  24. "Material and Structural Aspects of Lifting Re-Entry Aerospace Flight Systems," PowerPoint presentation sheets, no author, circa 1982
  25. "Supersonic Aerothermal Testing," Air Force Systems Command, Arnold Engineering Development Center, circa 1982

**Box 3** *Printed Material, 1983-1986*

Folder

1. Jones, K. M. "Application of a Full Potential Method for Predicting Supersonic Flow Fields and Aerodynamic Characteristics," Presented at the AIAA Applied Aerodynamics Conference, Danvers, MA, July 13-15, 1983
2. Beach, H. L. Jr., "Hypersonic Technology," Langley Research Center, August 3, 1983 (possible PowerPoint presentation)
3. "A Focused Hypersonic Research Program," a report prepared at the request of the Committee on Science and Technology, House of Representatives, Office of Aeronautics and Space Technology, November 1984
4. Czysz, P. A. "Hypersonic Aeronautical Research Road Map for 2000+ Potential," 1984
5. "Cooper: Scramjets next space booster," *Military Space*, p. 1, December 24, 1984
6. *Air & Space*, cover story, "Fly an airliner into space – it's the "Orient Express," August/September 1986 (includes a note, to Lana, from Jack Van Ness, "I thought that you would be interested in the cover story.")
7. Mann, P. (1986, March 24). Commission Sets Goals for Moon, Mars Settlements in 21<sup>st</sup> Century. *Aviation Week & Space Technology*, pp. 18-21.
8. Forte, J. (1986 October). Aerospace plane lures X-29 pilot. *Newsreview: Serving Air Force Systems Command*, Vol. XXX, No. 18, pp. 1, 8.
9. *Aerospace America*, "Aerospace Spotlight: Aerospaceplane wedded to supercomputer," and "Air Force actions could revive flagging ELV industry," p. 1, September 1986 (2 copies)
10. "Aero-Space Plane, or What is Required to Achieve Orbit with Airbreathing Propulsion?" by R. A. Jones, September 15, 1986
11. Bylinsky, G. (1986, December 8). The 10,000-MPH Airliner. *Fortune*, pp. 50-52, 56, 60.

### **Series 3. Audio Visual Material, 1985**

(0.2 cubic feet)

#### **Box 4**    *VHS™ Tapes, July 24, 1985*

##### Folder

1. House Subcommittee on Transportation, Aviation and Materials on High Speed Aeronautics with testimony from Dr. Raymond Colladay, Aeronautics and Space technician, NASA, July 24, 1985 (tape 1 of 2)
2. House Subcommittee on Transportation, Aviation and Materials on High Speed Aeronautics with testimony from Dr. Raymond Colladay, Aeronautics and Space technician, NASA, July 24, 1985 (tape 2 of 2)

### **Series 4. “Personal File,” – Photographs, Correspondence, and Newsletter Articles, circa 1974-1997**

(0.2 cubic feet)

#### **Box 4**    *Continuation of Box 4 – “Personal File,” circa 1974-1997*

##### Folder

3. *NASA Langley Researcher* newsletter, news photo – “Federal Woman’s Award. Lana M. Couch, High Speed Aircraft Division, and Barbara J. Durling, Structures and Dynamics Division, receive certificates of recognition from Deputy Director Oran W. Nicks...,” September 13, 1974
4. Correspondence, in regards to “clearance of technical reports,” October 16, 1974, and February 5, 1975
- 5.. Photograph of Couch, color, 8x10, “NASA L-76-3121” circa 1976
6. Photographs of “Thermal Structures Complex,” color, 8x10, undated (2 copies)
7. “Some Thoughts on Future Directions for the Space Systems Division,” by Walter B. Olstad, July 31, 1978
8. Photographs, 8, color, various sizes, from 1986 NASA Honor Awards Ceremony, Couch received the “Exceptional Service Medal,” and National Aviation Club, “Women in Aviation” 1986
9. Programs, National Aeronautics and Space Administration Honor Awards Ceremony, 1986, 1987/88
10. Correspondence – congratulations in regards to Couch’s part in United States Patent, 4,485,670, 1985
11. National Aviation Club, *aerolog*, “National Aviation Club Honors Women in Aviation,” November-December, 1986 (Couch in front page photo)
12. Correspondence in regards to Couch being selected to receive and accept NASA’s Group Achievement Award on behalf of the National Aero-Space Plane Program Team, February 1988
13. *NASA HQ Bulletin*, “Lana Couch Receives WIA (Women in Aerospace) Award, p. 1, July 10, 1989

14. Correspondence in regards to National Aero-Space Plane (NASP) program, August-September 1993
15. Program, correspondence, and letters of congratulations, upon Lana Couch's election to Fellow of the AIAA, 1997
16. Comics (2 original, featuring Couch and co-workers), and humorous sheet, undated