NASA Technical Memorandum 78651

LANGLEY'S SPACE SHUTTLE TECHNOLOGY - A BIBLIOGRAPHY

(NASA-TM-78651) LANGLEY'S SPACE SHUTTLE TECHNOLOGY: A BIBLIOGRAPHY (NASA) 67 p HC A04/MF A01 CSCL 22B

N81-30171

Unclas G3/16 27265

Gloria R. Champine

JULY 1981

National Aeronautics and Space Administration

Langley Research Center
Hampton, Virginia 23665

LANGLEY'S SPACE SHUTTLE TECHNOLOGY - A BIBLIOGRAPHY

by

Gloria R. Champine

SUMMARY

Included in this document is a compilation of most of the major research reports, journal articles, presentations, and contractor reports, written and published by the Langley Research Center staff or from work performed under contract, monitored by the Center staff. The research covers a number of discipline areas including, but not limited to, aerothermodynamics, structures, dynamics and aeroelasticity, environment, and materials. This bibliography has been compiled for historical purposes.

In the beginning days of space shuttle documentation reporting, an immense amount of wind-tunnel data was generated in support of the space shuttle by Langley personnel and the volume of publications became too great for the in-house reporting system to handle. As a consequence, a reporting system was utilized with Chrysler Corporation through a NASA contract (NAS9-13247) for data management. The reason for this contract was (a) to provide a uniform data base at one location and (b) to get the data into the information system rapidly. The resulting reports were referred to as SADSAC (System for

Automated Design of Shuttle Aerothermodynamic Characteristics) originally and later called DATAMAN (Data Management) reports. In order to properly present the full story of Langley's involvement in space shuttle development support, it was thought pertinent to include these publications in this report. In some instances the SADSAC/DATAMAN publications were converted to NASA contractor reports or to the NASA technical memorandum report series. This cross reference has been indicated where known.

References are listed chronologically within three major categories: A. NASA Formal Reports, B. Contractor Reports, and C. Articles and Conferences. In addition, an Appendix A has been included to list the SADSAC and DATAMAN publications during the past decade which have not always been credited to Langley though the research was performed by Langley researchers using Langley's and other government facilities for testing.

BACKGROUND

The Langley Space Shuttle Technology Task Group was established by the Langley Research Center Director on July 11, 1969 (LaRC Announcement 45-69) because of strong NASA interest in a large space station or base and an efficient transportation system or shuttle to supply it. The concept of a reusable space shuttle was of particular interest.

The responsibilities of the Task Group included:

1. Develop an integrated Langley research plan in support of the shuttle.

2. Help coordinate the implementation of this plan within the Center.

3. Assist NASA's Office of Advanced Research and Technology (OART) in developing a "Space Shuttle Technology Program."

4. Assist NASA's Office of Manned Space Flight (OMSF) and its Centers in conducting space shuttle studies and configuration selections.

5. Serve as a focal point within Langley for developing solutions to specific shuttle problems.

Further support for the Task Group was announced on August 1, 1969 (LaRC Announcement 54-69) involving personnel assignments, and location of Task Group in Building 1251. This announcement stated the activity of the Task Group would require heavy involvement of many other divisions at the Center and established an

Engineering Design Office and a Technical Program Coordinating Office, reporting to Mr. Eugene S. Love, Head, Space Shuttle Technology Task Group.

To provide a continuing focus for Langley research and technology support of two major system developments then planned for the 1970's, the space station/base and the space shuttle, a Space Systems Research Division was established on January 11, 1970, (LaRC Announcement 1-70) with Mr. Love being named Chief of this new division.

In addition to the specific research and study tasks, the Space Systems Research Division was to assume a Center-wide coordination function for the space shuttle and space station activities. Because of the responsibility for Center-wide coordination of space station/base and space shuttle activities, the structure and charter of the SSRD was different from that of most research divisions. As Langley's focal point, SSRD was to involve other research divisions so that their full available strength could be brought to bear on critical problems.

The references included in this bibliography show the magnitude of studies, both in-house and under contract, across Center division and directorate lines which have provided the intensive support required by this major developmental effort over the last decade.

A. NASA FORMAL REPORTS

SPACE SHUTTLE TECHNOLOGY

A. NASA Formal Reports

Decker, J. P.; and Spencer, B., Jr.: Low-Subsonic Aerodynamic Characteristics of a Model of a Fixed-Wing Space Shuttle Concept at Angles of Attack to 76 Deg. NASA TM X-1996, April 1970.

Anon.: Space Transportation System Technology Symposium, Volume I - Aerothermodynamics and Configurations. NASA TM X-52876, July 1970.

Anon.: Space Transportation System Technology Symposium. Volume II - Dynamics and Aeroelasticity. NASA TM X-52876, July 1970.

Anon.: Space Transportation System Technology Symposium. Volume III - Structures and Materials. NASA TM X-52876, July 1970.

Anon.: Space Transportation Systems Technology Symposium. Volume IV - Propulsion. NASA TM X-52876, July 1970.

Anon.: Space Transportation System Technology Symposium. Volume V - Operations, Maintenance, and Safety (Including Cryogenic Systems). NASA TM X-52876, July 1970.

Anon.: Space Transportation System Technology Symposium. Volume VI - Integrated Electronics (Including Electric Power). NASA TM X-52876, July 1970.

Anon.: Space Transportation System Technology Symposium. Volume VII - Biotechnology. NASA TM X-52876, July 1970.

Stone, D. R.: Aerodynamic Characteristics of a Fixed-Wing Manned Space Shuttle Concept at Mach No. of 6.0. NASA TM X-2049, September 1970.

Anderson, R. A.: Technology - Structures and Thermal Protection Systems. NASA TM X-66715, 1970.

Henderson, A., Jr.: Space Shuttle Technology - Aerodynamics. NASA TM X-66897, 1970.

Anon.: Blue Book. Volume 1, Summary. Design of Flexible, Multidisciplinary Orbiting Space Facility and Logistics System and Definition of Research Projects to be Conducted. January 1971.

A. NASA Formal Reports - Continued

Anon.: Blue Book. Volume 4, Earth Observations. Design, Development, and Operation of Earth Observations Facility Installed on Space Station and Space Shuttle. January 1971.

Anon.: Blue Book. Volume 5, Communications/Navigation. Design, Development, and Operation of Communications and Navigation Facility Aboard Space Stations and Space Shuttles. January 1971.

Freeman, D. C., Jr.: Low-Subsonic Aerodynamic Characteristics of a Space Shuttle-Orbiter Concept With a Blended Delta Wing-Body. NASA TM X-2209, January 1971.

Ware, George M.; and Spencer, B., Jr.: Low-Subsonic Aerodynamic Characteristics of a Shuttle-Orbiter Configuration With a Variable-Dihedral Delta Wing. NASA TM X-2206, January 1971.

Harrison, E. F.; and Pritchard, E. B.: Use of Space Tug to Increase Payload Capability of Space Shuttle. NASA TN D-6241, February 1971.

Hefner, J. N.: Boundary-Layer Transition for Space Shuttle-Type Configurations at Angles of Attack. NASA TM X-2254, March 1971.

Spencer, B., Jr.; and Ware, G. M.: Low-Subsonic Longitudinal Aerodynamic Characteristics of a Twin-Body Space Shuttle Booster Configuration. NASA TM X-2161, April 1971.

Anon.: NASA Space Shuttle Technology Conference. Volume I - Aerothermodynamics, Configurations, and Flight Mechanics. NASA TM X-2272, April 1971.

Anon.: NASA Space Shuttle Technology Conference. Volume II - Structures and Materials. NASA TM X-2273, April 1971.

Anon.: NASA Space Shuttle Technology Conference. Volume III - Dynamics and Aeroelasticity. NASA TM X-2274, April 1971.

Bernot, P. T.; and Huffman, J. K.: Aerodynamic Characteristics of a Booster and an Ascent Shuttle Configuration From Mach 0.28 to Mach 10.4. NASA TM X-2265, May 1971.

Fox, C. H., Jr.; and Freeman, D. C., Jr.: Subsonic Stability, Control, and Performance of a Shuttle Concept With a Blended Wing-Body. NASA TM X-2341, July 1971.

A. NASA Formal Reports - Continued

Brooks, D. R.; and Harrison, E. F.: Use of Orbit-to-Orbit Shuttles for Hyperbolic Rendezvous With Returning Planetary Spacecraft. NASA TN D-6342, September 1971.

Anon.: NASTRAN Users' Experiences. NASA TM X-2378, September 1971.

Giles, G. L.; and Dutton, J. H.: Application of NASTRAN to the Analysis of a Space Shuttle Orbiter Structure. NASA TM X-2378, September 1971.

Lisagor, W. B.; and Gardner, J. E.: Hot Salt Stress Corrosion Cracking of Titanium Alloys Overview and Impact on Space Shuttle Application. NASA TM X-68304, January 1972.

Ashby, G. C., Jr.: Experimental Boundary-Layer Edge Mach Numbers for Two Space Shuttle Orbiters at Hypersonic Speeds. NASA TN D-6574, February 1972.

Ashby, G. C., Jr.: Comparison of Hinge Moments for a Simple Delta Wing and a Delta-Wing Orbiter Concept at Mach 6. NASA TN D-6657, February 1972.

Freeman, D. C., Jr.: Effect of Configuration Modifications on the Low-Subsonic Aerodynamic Characteristics of a Space Shuttle Orbiter Concept With a Blended Delta Wing-Body. NASA TM X-2513, February 1972.

Putnam, L. E.: Aerodynamic Characteristics of an Agee-Wing Space Shuttle Orbiter Concept at a Mach Number of 2.01. NASA TM X-2473, February 1972.

Anon.: Space Shuttle Aerothermodynamics Technology Conference, Volume I - Flow Fields. NASA TM X-2506, February 1972.

Anon.: Space Shuttle Aerothermodynamics Technology Conference, Volume II - Heating. NASA TM X-2507, February 1972.

Anon.: Space Shuttle Aerothermodynamics Technology Conference, Volume III - Aerodynamics. NASA TM X-2508, February 1972.

Anon.: Space Shuttle Aerothermodynamics Technology Conference, Volume IV - Operational Flight Mechanics. NASA TM X-2509, February 1972.

A. NASA Formal Reports - Continued

Graves, E. B.: Aerodynamic Characteristics of a 60 Degree Swept Delta-Wing Space Shuttle Orbiter at Mach Numbers of 2.50, 3.90, and 4.60. NASA TM X-2561, May 1972.

Corvelli, N.; and Carri, R.: Evaluation of Boron-Epoxy-Reinforced Titanium Tubular Truss for Application to a Space Shuttle Booster Thrust Structure. NASA TN D-6778, June 1972.

Anon.: NASA Space Shuttle Technology Conference. Dynamics and Aeroelasticity; Structures and Materials. NASA TM X-2570, July 1972.

Stubbs, S. M.: Water Landing Characteristics of a Model of a Winged Reentry Vehicle. NASA TN D-6859, August 1972.

Graves, E. B.: Supersonic Aerodynamic Characteristics of a Two-Staged Space Shuttle-Model Having a Delta-Wing Orbiter Mated Atop a Winged Booster. NASA TM X-2569, September 1972.

Rainey, R. W.; Ware, G. M.; Powell, R. W.; Brown, L. W.; and Stone, D. R.: Grumman H-33 Space Shuttle Orbiter Aerodynamic Characteristics and Handling Qualities Study. NASA TN D-6948, September 1972.

Royster, D. M.; and Lisagor, W. B.: Effect of High Temperature Creek and Oxidation on Residual Room Temperature Properties for Several Thin Sheet Superalloys. NASA TN D-6893, November 1972.

Bernot, P. T.; and Throckmorton, D. A.: Hypersonic Aerothermal Characteristics of a Manned Low Fineness Ratio Shuttle Booster. NASA TM X-2642, November 1972.

Hefner, J. N.: Lee-Surface Heating and Flow Phenomena on Space Shuttle Orbiters at Large Angles of Attack and Hypersonic Speeds. NASA TN D-7088, November 1972.

Graves, E. B.: Wind-Tunnel Tests of a Single-Stage-to-Orbit Space Shuttle at Mach Numbers of 2.60, 3.85, and 4.64. NASA TM X-2667, November 1972.

Spencer, B., Jr.; and Ware, G. M.: Low Subsonic Aerodynamic Characteristics of a Shuttle Orbiter Having 35 Degree Trapezoidal Wing and 75 Degree Inboard Glove. NASA TM X-2701, January 1973.

A. NASA Formal Reports - Continued

Lordi, J. A.; Vidal, R. J.; and Johnson, C. B.: Chemical Nonequilibrium Effects on the Inviscid Flow in the Windward Plane of Symmetry of Two Simplified Shuttle Configurations. NASA TN D-7189, March 1973.

Campbell, J. W.: The Development of a Stochastic Model of the Atmosphere Between 30 and 90 KM to be Used in Determining the Effect of Atmosphere Variability on Space Shuttle Entry Parameters. NASA TM X-69567, March 1973.

Ware, G. M.; and Spencer, B., Jr.: Low-Subsonic Aerodynamic Characteristics of a Shuttle-Orbiter Configuration Designed for Reduced Length. NASA TM X-2712, April 1973.

Blair, A. B., Jr.; and Grow, J.: Aerodynamic Characteristics of a 55 Degree Clipped-Delta-Wing Orbiter Model at Mach Numbers From 1.60 to 4.63. NASA TM X-2748, May 1973.

Freeman, D. C., Jr.: Low-Subsonic Aerodynamic Characteristics of a 60 Degree Swept Delta Wing Space Shuttle Orbiter. NASA TM X-2762, July 1973.

Ellison, J. C.: Subsonic Aerodynamic Characteristics of a Space Shuttle Orbiter. NASA TM X-2786, July 1973.

Ware, G. M.; Spencer, B., Jr.; and Fournier, R. H.: Supersonic Aerodynamic Characteristics of the North American Rockwell ATP Shuttle Orbiter. NASA TM X-2804, August 1973.

Arrington, J. P.; and Stone, D. R.: Aerodynamic and Flow-Visualization Studies of Two Delta-Wing Entry Vehicles at a Mach Number of 20.3. NASA TN D-7282, August 1973.

Chapman, A. J.: Evaluation of Reusable Surface Insulation for Space Shuttle Over a Range of Heat-Transfer Rate and Surface Temperature. NASA TM X-2823, October 1973.

Hess, R. W.; and Davenport, E. E.: Wind-Tunnel Roll-Damping Measurements of a Winged Space Shuttle Configuration in Launch Attitude. NASA TN D-7394, December 1973.

Keyes, J. W.; and Hains, F. D.: Analytical and Experimental Studies of Shock Interference Heating in Hypersonic Flows. NASA TN D-7139, 1973.

A. NASA Formal Reports - Continued

Staff Shuttle Experiments Office: Study of Shuttle Compatible Advanced Technology Laboratory (ATL). NASA TM X-2813, 1973.

Stone, H. W.: Supersonic and Hypersonic Aerodynamic Characteristics of Two Shuttle-Orbiter Configurations Designed for Reduced Length. NASA TM X-71956, April 1974.

Bernot, Peter T.: Reynolds Number Effects on Hypersonic Characteristics of an 0.010-Scale Model of the 139-B Shuttle Orbiter (LA-35). NASA TM X-71954, April 1974.

Phillips, W. P.; Decker, J. P.; Rau, T. R.; and Glatt, C. R.: Computer-Aided Space Shuttle Orbiter Wing Design Study. NASA TN D-7478, May 1974.

Gilreath, M. C.; and Castellow, S. L., Jr.: High-Temperature Dielectric Properties of Candidate Space Shuttle Thermal Protection System and Antenna Window Materials. NASA TN D-7523, June 1974.

Powell, R. W.; and Eide, D. G.: Investigation of Abort Procedures for Space Shuttle-Type Vehicles. NASA TM X-71952, June 1974.

Rainey, R. W.; Rehder, J. J.; and Klich, P. J.: A Shuttle Development Flight Test Vehicle Study. NASA TM X-71978, June 1974.

Stone, D. R.; and Mulfinger, R.: Hypersonic Stability and Control Characteristics of the Rockwell International 139-B Space Shuttle Orbiter. NASA TM X-71968, July 1974.

Stone, D. R.; and Spencer, B., Jr.: Aerodynamic and Flow Visualization Studies of Variations in the Geometry of Irregular Planform Wings at a Mach Number of 20.3. NASA TN D-7650, August 1974.

Martin, J. A.: A Method for Determining Optimum Phasing of a Multiphase Propulsion System for a Single-Stage Vehicle With Linearized Inert Weight. NASA TN D-7792, November 1974.

A. NASA Formal Reports - Continued

Decker, J. P.: and Phillips, W. P.: Influence of Configuration Details on the Subsonic Characteristics of a Space Shuttle Orbiter Design. NASA TM X-3159, December 1974.

Boyden, R. P.; and Freeman, D. C.: Subsonic and Transonic Dynamic Stability Derivatives of a Modified 089B Shuttle Orbiter. NASA TM X-72631, December 1974.

Jones, J. Earl; and Richmond, J. H.: An Integral Equation Formulation for Predicting Radiation Patterns of a Space Shuttle Annular Slot Antenna. NASA TN D-7594, 1974.

Freeman, Delma C.; Boyden, Richmond P.; and Davenport, E. E.: Supersonic Dynamic Stability Derivatives of a Modified 089B Shuttle Orbiter. NASA TM X-72630, January 1975.

Ellison, J. C.: Influence of Orbital-Maneuvering-System Fairings and Rudder Flare on the Transonic Aerodynamic Characteristics of a Space Shuttle Orbiter. NASA TM X-2862, February 1975.

Bernot, P. T.: Abort Separation Study of a Shuttle Orbiter and External Tank at Hypersonic Speeds. NASA TM X-3212. May 1975.

Bernot, P. T.: Space Shuttle Orbiter Trimmed Center of Gravity Extension Study. Volume I. Effects of Configuration Modifications on the Aerodynamic Characteristics of the 140 A/B Orbiter at Mach 10.3. NASA TM X-72661, June 1975.

Tompkins, S. S.; and Kabana, W. P.: Experimental Evaluation of Joint Designs for a Space-Shuttle Orbiter Ablative Leading Edge. NASA TM X-3230, July 1975.

Paulson, J. W., Jr.: Aerodynamic Characteristics of a Large Aircraft to Transport Space Shuttle Orbiter or Other External Payloads. NASA TN D-7962, August 1975.

Throckmorton, D. A.: Pressure Gradient Effects on Heat Transfer to Reusable Surface Insulation Tile-Array Gaps. NASA TN D-7939, August 1975.

Ransone, P. O.; and Morrison, J. D.: The Effects of Environmental Exposure on Reusable Surface Insulation for Space Shuttle. NASA TM X-3252, October 1975.

A. NASA Formal Reports - Continued

Campbell, J. W.: A Cost Assessment of Reliability Requirements for Shuttle-Recoverable Experiments. NASA TN D-8016, November 1975.

Weinstein, I.; Avery, D. E.; and Chapman, A. J.: Aerodynamic Heating to the Gaps and Surfaces of Simulated Reusable-Surface-Insulation Tile Arrays in Turbulent Flow at Mach 6.6. NASA TM X-3225, November 1975.

Pittman, C. M.; and Brown, R. D.: Surface Recession Characteristics of a Cryogenic Insulation Subjected to Arc-Tunnel Heating. NASA TM X-3291, November 1975.

Boyden, R. P.; and Freeman, D. C., Jr.: Subsonic and Transonic Dynamic Stability Characteristics of a Space Shuttle Orbiter. NASA TN D-8042, November 1975.

Anderson, W. W.; and Joshi, S. M.: The Annular Suspension and Pointing (ASP) System for Space Experiments and Predicted Pointing Accuracies. NASA TR R-448, December 1975.

Pinson, L. D.: Analytical and Experimental Vibration Studies of a 1/8-Scale Shuttle Orbiter. NASA TN D-7964, December 1975.

Ware, George M.; and Spencer, Bernard, Jr.: The Effects of Surface Roughness and Angle of Attack Transition on the Aerodynamics of a Space Shuttle Orbiter at Mach Numbers From 0.25 to 4.63. NASA TM X-71940, 1975.

Freeman, D. C., Jr.; Boyden, R. P.; and Davenport, E. E.: Supersonic Dynamic Stability Characteristics of a Space Shuttle Orbiter. NASA TN D-8043, January 1976.

Boyden, R. P.; Freeman, D. C., Jr.; and Davenport, E. E.: Supersonic Dynamic-Stability Derivatives of the Space Shuttle Launch Vehicle. NASA TM X-3315, February 1976.

Freeman, D. C., Jr.; Boyden, R. P.; and Davenport, E. E.: Subsonic and Transonic Dynamic Stability Characteristics of the Space Shuttle Launch Vehicle. NASA TM X-3336, March 1976.

Hunt, L. R.; Shideler, J. L.; and Weinstein, I.: Performance of LI-1542 Reusable Surface Insulation System in a Hypersonic Stream. NASA TN D-8150, March 1976.

A. NASA Formal Reports - Continued

Crawford, D. H.: Shock Interference Heat Transfer to Tank Configurations Mated to a Straight-Wing Space Shuttle Orbiter at Mach Number 10.3. NASA TN D-8203, April 1976.

Blair, A. B., Jr.: Effect of Reynolds Number on the Aerodynamic Stability and Control Characteristics of a 55 Degree Clipped-Delta-Wing Orbiter Configuration at Supersonic Mach Numbers. NASA TM X-3376, May 1976.

Leadbetter, S. A.; Stephens, W.; Sewall, J. L.; Majka, J.; and Barret, J. R.: Vibration Characteristics of 1/8-Scale Dynamic Models of the Space Shuttle Solid-Rocket Boosters. NASA TN D-8158, May 1976.

Throckmorton, D. A.: Effect of a Surface-to-Gap Temperature Discontinuity on the Heat Transfer to Reusable Surface Insulation Tile Gaps. NASA TN D-8233, June 1976.

Eide, D. G.; and Rau, T. R.: A Demonstration of an Economic Figure of Merit and Techno-Economic Sensitivities of an Advanced Single-Stage-to-Orbit Vehicle. NASA TM X-72808, July 1976.

Hunt, L. R.: Performance of a Mullite Reusable Surface Insulation System in a Hypersonic Stream. NASA TM X-3397, August 1976.

Bonner, T. F., Jr.; and Pride, J. D., Jr.: A Tow Concept for the Space Shuttle Orbiter Approach and Landing Test. NASA TM X-73972, August 1976.

Preisser, J. S.; and Lowder, H. E., Jr.: Comparison of Theoretical and Experimental Steady Wing Loads on a Space Shuttle Configuration at Mach Numbers of 0.6 and 1.4. NASA TM X-3404, September 1976.

Phillips, W. Pelham: Space Shuttle Orbiter Trimmed Center-of-Gravity Extension Study: Volume II - Effects of Configuration Modifications on the Aerodynamic Characteristics of the 140A/B Orbiter at Transonic Speeds. NASA TM X-72661, September 1976.

Powell, R. W.; Stone, H. W.; and Rowell, L. R.: Effects of Modifications to the Space Shuttle Entry Guidance and Control Systems. NASA TN D-8273, October 1976.

A. NASA Formal Reports - Continued

Lamb, M.; and Stallings, R. L., Jr.: Heat-Transfer Distributions on a 0.013-Scale Shuttle Solid Rocket Booster at Mach 3.70 and Angles of Attack From 0 Degrees to 180 Degrees. NASA TM X-3417, November 1976.

Klich, G. F.: The Langley Thermal Protection System Test Facility: A Description Including Design Operating Boundaries. NASA TM X-73973, November 1976.

Anon.: Executive Summary, OAST Summer Workshop. NASA TM X-73960, 1976.

Anon.: Volume I, Data Processing and Transfer, OAST Summer Workshop, NASA TM X-73961, 1976.

Anon.: Volume II, Sensing and Data Acquisition, OAST Summer Workshop, NASA TM X-73962.

Anon.: Volume III, Navigation, Guidance and Control, OAST Summer Workshop, NASA TM X-73963, 1976.

Anon.: Volume IV, Power Technology, OAST Summer Workshop, NASA TM X-73964, 1976.

Anon.: Volume V, Propulsion Technology, OAST Summer Workshop, NASA TM X-73965, 1976.

Anon.: Volume VI, Structures and Dynamics, OAST Summer Workshop, NASA TM X-73966, 1976.

Anon.: Volume VII, Materials, OAST Summer Workshop, NASA TM X-73967, 1976.

Anon.: Volume VIII, Thermal Control, OAST Summer Workshop, NASA TM X-73968, 1976.

Anon.: Volume IX, Entry Technology, OAST Summer Workshop, NASA TM X-73969, 1976.

Anon.: Volume X, Basic Research, OAST Summer Workshop, NASA TM X-73970, 1976.

Anon.: Volume XI, Life Support, OAST Summer Workshop, NASA TM X-73961, 1976.

A. NASA Formal Reports - Continued

Dicus, Dennis L.; Hopko, Russell N.; and Brown, Ronald D.: Ablative Performance of Uncoated Silicone-Modified and Shuttle Baseline Reinforced Carbon Composites. NASA TN D-8358, 1976.

Freeman, Delma C., Jr.; and Boyden, Richmond P.: Dynamic Stability Characteristics of the Combination Space Shuttle Orbiter and Ferry Vehicle. NASA TM X-3497, May 1977.

Wilhite, Alan W.: Separation Analysis of the Space Shuttle Orbiter From a Larger Carrier Aircraft. NASA TM X-3492, June 1977.

Humes, Donald H.: Hypervelocity Impact Tests on Space Shuttle Orbiter Thermal Protection Material. NASA TM X-74039, June 1977.

Powell, Richard W.: Aileron Roll Hysteresis Effects on Entry of Space Shuttle Orbiter. NASA TN D-8425, July 1977.

Blanchard, Ulysse J.; Miserentino, Robert; and Leadbetter, Sumner A.: Experimental Investigation of the Vibration Characteristics of a Model of an Asymmetrical Multielement Space Shuttle. NASA TN D-8448, September 1977.

Ashby, George C., Jr.; and Helms, Vernon T., III: Flow-Field Surveys on the Windward Side of the NASA 040A Space Shuttle Orbiter at 31° Angle of Attack and Mach 20 in Helium. NASA TM X-3560, October 1977.

Stone, Howard W.; and Powell, Richard W.: Entry Dynamics of Space Shuttle Orbiter With Longitudinal Stability and Control Uncertainties at Supersonic and Hypersonic Speeds. NASA TP-1084, October 1977.

Ellison, James C.: Supersonic Longitudinal Aerodynamic Characteristics of Two Space Shuttle Orbiter Configurations. NASA TM-74074, November 1977.

Stone, Howard W.; and Powell, Richard W.: Entry Dynamics of Space Shuttle Orbiter With Stability and Control Uncertainties at Supersonic and Hypersonic Speeds. NASA TP-1011, December 1977.

SPACE SHUTTLE TECHNOLOGY

A. NASA Formal Reports - Continued

Carlson, Harry W.; and Mack, Robert J.: A Wind-Tunnel Study of the Applicability of Far-Field Sonic-Boom Theory to the Space Shuttle Orbiter. NASA TP-1186, 1978.

Hall, William M.: An Introduction to Shuttle/LDEF Retrieval Operations: The R-Bar Approach Options. NASA TM-78668, 1978.

Scallion, William I.; and Stone, David R.: Space Shuttle Orbiter Trimmed Center-of-Gravity Extension Study: Volume IV - Effects of Configuration Modifications of the 139B Orbiter at Mach 20.3. NASA TM X-72661, March 1978.

MacConochie, Ian O.: Space Shuttle Orbiter Trimmed Center of Gravity Extension Study: Volume VI - System Design Studies. NASA TM X-72661, August 1978.

Dunavant, James C.: Space Shuttle Orbiter Trimmed Center-of-Gravity Extension Study: Volume III - Impact of Retrofits for Center-of-Gravity Extension on Orbiter Thermal Protection System. NASA TM-X 72661, February 1979.

Ashby, George C., Jr.: Near Field Sonic Boom Pressures for the Space Shuttle Launch and Orbiter Vehicles at Mach 6. NASA TP-1405, April 1979.

Bernot, Peter T.: Aerodynamic Characteristics of the 140A/B Space Shuttle Orbiter at Mach 10.3. NASA TM-80086, May 1979.

Phillips, W. Pelham; and Fournier, Roger H.: Space Shuttle Orbiter Trimmed Center-of-Gravity Extension Study: Volume V - Effects of Configuration Modifications on the Aerodynamic Characteristics of the 140A/B Orbiter at Mach Numbers of 2.5, 3.95, and 4.6. NASA TM-72661, June 1979.

Bradley, Pamela F.: An Experimental Investigation to Determine the Effect of Window Cooling by Mass Injection for the Shuttle Infrared Leeside Temperature Sensing (SILTS) Experiment. NASA TM-80170, September 1979.

Keckler, Claude R.; Kibler, Kemper S.; and Rowell, Lawrence F.: Determination of ASPS Performance for Large Payloads in the Shuttle Orbiter Disturbance Environment. NASA TM-80189, 1979.

Ransome, Philip O.; Morrison, J. D.; and Minster, John E.: Environmental Effects on Space Shuttle Reusable Surface Insulation Coated With Reaction Cured Glass. NASA TM-80071, 1979.

SPACE SHUTTLE TECHNOLOGY

A. NASA Formal Reports - Continued

Ransone, Philip O.; Morrison, J. D.; and Minster, John E.: Effect of 25 Cycles of Launch Pad Exposure and Simulated Mission Heatin on Space Shuttle Reusable Surface Insulation Coated With Cured Glass. NASA TM-80160, 1979.

Atmospheric Lidar Working Group: Shuttle Atmospheric Lidar Research Program - Final Report of Atmospheric Lidar Workinq Group. NASA SP-433, 1979.

Williams, Jerry G.: Structural Tests on a Tile/Strain Isolation Pad Thermal Protection System. NASA TM-80226, March 1980.

Sawyer, James Wayne; and Rummler, Donald R.: Room Temperature Mechanical Properties of Shuttle Thermal Protection System Materials. NASA TM-81736, April 1980.

Riley, Donald R.: and Miller, G. Kimball, Jr.: Simulator Study of the Effect of Control-System Time Delays on the Occurrence of Pilot-Induced Oscillations and on Pilot Tracking Performance with a Space Shuttle Orbiter Configuration. NASA TP-1588, April 1980.

Jackson, L. Robert; and Dixon, Sidney C.: A Design Assessment of Multiwall, Metallic Stand-Off and RSI Reusable Thermal Protection Systems Including Space Shuttle Application. NASA TM-81730, April 1980.

Freeman, Delma C., Jr.: Dynamic Stability Derivatives of Space Shuttle Orbiter Obtained From Wind-Tunnel and Approach and Landing Flight Tests. NASA TP-1634, April 1980.

Shinn, Judy L.: Comparison of Predicted and Experimental Real-Gas Pressure Distributions on Space Shuttle Orbiter Nose for Shuttle Entry Air Data System. NASA TP-1627, April 1980.

Ransone, Philip O.; and Rummler, Donald R.: Microstructural Characterization of the HRSI Thermal Protection System for Space Shuttle. NASA TM-81821, May 1980.

Tompkins, Stephen S.; Pittman, Claud M.: and Stacey, Albert B., Jr.: Thermal Performance of a Mechanically Attached Ablator Tile for On-Orbit Repair of Shuttle TPS. NASA TM-81822, May 1980.

O'Bryan, Thomas C.; Goode, Maxwell W.; Gregory, Frederick D.; and Mayo, Marna H.: Description of an Experimental (Hydrogen Peroxide) Rocket System and Its Use in Measuring Aileron and Rudder Effectiveness of a Light Airplane, NASA TP-1647, May 1980.

A. NASA Formal Reports - Continued

Yager, Thomas J.; and Horne, Walter B.: Friction Evaluation of Unpaved, Gypsum-Surface Runways at Northrop Strip, White Sands Missile Range, in Support of Space Shuttle Orbiter Landing and Retrieval Operations. NASA TM-81811, June 1980.

Miserentino, Robert R.; Pinson, Larry D.; and Leadbetter, Sumner A.: Some Space Shuttle Tile/Strain-Isolator-Pad Sinusoidal Vibration Tests. NASA TM-81853, July 1980.

Newman, J. C., Jr.: Notch Sensitivity of Space Shuttle Tile Materials. NASA TM-81854, July 1980.

Tompkins, S. S.; Brewer, W. D.; Clark, R. K.; Pittman, C. M.; and Brinkley, K. L.: An Assessment of the Readiness of Ablative Materials for Preflight Application to the Shuttle Orbiter. NASA TM-81823, July 1980.

Shore, Charles P.; and Garcia, Ramon: Effects of Substrate Deformation and SIP Thickness on Tile/SIP Interface Stresses for Shuttle Thermal Protection System. NASA TM-81855, July 1980.

Powell, Richard W.; and Stone, Howard W.: Analysis of the Space Shuttle Orbiter Entry Dynamics From Mach 10 to Mach 2.5 With the November 1976 Flight Control System. NASA TP-1667, August 1980.

Giles, Gary L.: Substructure Procedure for Including Tile Flexibility in Stress Analysis of Shuttle Thermal Protection System. NASA TM-81864, August 1980.

Prabhakaran, R.; and Cooper, Paul A.: Photoelastic Tests on Models of Thermal Protection System for Space Shuttle Orbiter. NASA TM-81866, August 1980.

Lawing, Pierce L.; and Nystrom, Donna M.: Pressure Drop Characteristics for Shuttle Orbiter Thermal Protection System Components: High Density Tile, Low Density Tile, Densified Low Density Tile, and Strain Isolation Pad. NASA TM-81891, October 1980.

Brewer, W. D.; Pittman, C. M.; and Tompkins, S. S.: Preliminary Arc-Jet Tests of Ablator/RSI Joints in Simulated Space Shuttle Ascent and Entry Heating. NASA TM-81907, October 1980.

Rowell, Lawrence F.; Powell, Richard W.; and Stone, Howard W., Jr.: Development of the Reentry Flight Dynamics Simulator for Evaluation of the Space Shuttle Orbiter Entry Systems. NASA TP-1700, October 1980.

A. Formal Reports - Continued

Housner, Jerrold M.; Edighoffer, Harold H.; and Park, K. C.: Nonlinear Dynamic Response of a Uni-Directional Model for the Tile/Pad Space Shuttle Thermal Protection System. NASA TM-81901, November 1980.

Freeman, Delma C., Jr.: and Spencer, Bernard, Jr.: Comparison of Space Shuttle Orbiter Low-Speed Static Stability and Control Derivatives Obtained From Wind-Tunnel and Approach and Landing Flight Tests. NASA TP-1779, December 1980.

Phillips, W. Pelham: Space Shuttle Orbiter Trimmed Center-of-Gravity Extension Study: Volume VII - Effects of Configuration Modifications on the Subsonic Aerodynamic Characteristics of the 140 A/B Orbiter at High Reynolds Numbers. NASA TM-72661, March 1981.

Champine, Gloria R.: Langley's Space Shuttle Technology - A Bibliography. NASA TM-78651, April 1981.

B. CONTRACTOR REPORTS

B. Contractor Reports

Ware, George M.; and Spencer, Bernard, Jr.: Surface Roughness Effects on the Supersonic Aerodynamics of the Rockwell International 089B-139 Orbiter. NASA CR-128796, (NAS9-13247 Chrysler Corporation), 1973.

Woods, William C.; Stone, David R.; and Arrington, James P.: Aerodynamic and Flow-Visualization Studies on a Space Shuttle Concept With a Double-Delta-Wing Orbiter at a Mach Number of 20.3. NASA CR-128764, (NAS9-13247 Chrysler Corporation), 1973.

Lake, E. R.; Thompson, S. J.; and Drexelius, V. W.: A Study of the Role of Pyrotechnic Systems on the Space Shuttle Program. NASA CR-2292, (NAS1-10892 McDonnell Douglas Corporation), 1973.

Johnson, R., Jr.; and Killpatrick, D. H.: Evaluation of Dispersion Strengthened Nickel-Base Alloy Heat Shields for Space Shuttle Application - Phase I - Summary Report. NASA CR-132360, (NAS1-11654 McDonnell Douglas Astronautics Company), 1973.

Ormiston, R.; and Tanzilli, R. A.: Development of an External Ceramic Insulation for the Space Shuttle Orbiter - Part III - Development of Stabilized Aluminum Phosphate Fibers. NASA CR-132331, (NAS1-10533 General Electric Company), 1973.

Seiferth, Rolf W.: Ablative Heat Shield Design for Space Shuttle. NASA CR-132282, (NAS1-11592 Martin Marietta Corporation), 1973.

Tanzilli, Richard A.: Development of an External Ceramic Insulation for the Space Shuttle - Part II - Optimization. NASA CR-112257, (NAS1-10533 General Electric Reentry and Environmental Systems Division), 1973.

Ashby, George C., Jr.: Hypersonic Aerodynamic Characteristics of NR-ATP Orbiter, Orbiter With External Tank, and Ascent Configuration. NASA CR-128754, (NAS9-13247 Chrysler Corporation), 1973.

Bernot, Peter T.: Hypersonic Performance, Stability, and Control Characteristics of a 0.010-Scale Model of a Langley Concept Space Shuttle Orbiter. NASA CR-128769, (NAS9-13247 Chrysler Corporation), 1973.

B. Contractor Reports - Continued

Blackstock, Thomas A.: Hypersonic Performance, Stability, and Control Characteristics of 0.0075-Scale Model North American Rockwell ATP Orbiter Configuration. NASA CR-128751, (NAS9-13247 Chrysler Corporation), 1973.

Huyett, R. C.; and Ring, R. C.: Modification and Updating of the Manned Activity Scheduling System (MASS) for Shuttle and Shuttle Payloads Analysis, Vol. I - Model Modifications. NASA CR-112286, (NAS1-11674 General Dynamics/Convair Aerospace), 1973.

Powell, R. W.; and Blackstock, T. A.: Hypersonic Performance, Stability, and Control Characteristics of a 0.0075-Scale Model Rockwell International 089B-139B Orbiter Configuration. NASA CR-128783, (NAS9-13247 Chrysler Corporation), 1973.

Spencer, Bernard, Jr.: Stability and Control Characteristics of a Langley Concept Space Shuttle Orbiter (LO-100) at Low Subsonic Speeds. NASA CR-128787, (NAS9-13247 Chrysler Corporation), 1973.

Fournier, Roger H.; and Spencer, Bernard, Jr.: Aerodynamic Stability and Control Characteristics of an 0.01925-Scale Model NR ATP Orbiter at Mach Numbers from 1.90 to 4.63. NASA CR-128750 (NAS9-13247 Chrysler Corporation), 1973.

Bassett, Harold L.; and Bomar, Steve H., Jr.: Complex Permittivity Measurements During High Temperature Recycling of Space Shuttle Antenna Window and Dielectric Heat Shield Materials. NASA CR-2302, (NAS1-11267 Georgia Institute of Technology), 1973.

Kuhlman, E. A.: Investigation of High Temperature Antennas for Space Shuttle. NASA CR-2294. (NGR 23-005-477 University of Michigan), 1973.

Hasselman, T. K.: Study of Modal Coupling Procedures for the Shuttle: A Matrix Method for Damping Synthesis. NASA CR-112253, (NAS1-10635-8 Grumman Aerospace Corporation), 1973.

Hopkins, A. Stewart; and Davis, William F.: Interaction of the Space Shuttle Pogo and Control Systems. NASA CR-2154. (NAS1-11055 McDonnell Douglas Astronautics Company), 1973.

Laakso, J. H.; and Zimmerman, D. K.: Evaluation of a Metal Shear Web Selectively Reinforced With Filamentary Composites for Space Shuttle Application - Phase I Report. NASA CR-132320, (NAS1-10860 The Boeing Company), 1973.

B. Contractor Reports - Continued

Laakso, J. H.; Smith, D. D.; and Zimmerman, D. K.: Evaluation of a Metal Shear Web Selectively Reinforced With Filamentary Composites for Space Shuttle Application - Phase II Report. NASA CR-132321, (NAS1-10860 The Boeing Company), 1973.

Laakso, J. H.; and Straayer, J. W.: Evaluation of a Metal Shear Web Selectively Reinforced With Filamentary Composites for Space Shuttle Application - Phase III Summary Report - Shear Web Component Testing and Analysis. NASA CR-132322, (NAS1-10860 The Boeing Company), 1973.

Rubin, S.; Wagner, R. G.; and Payne, J. G.: Pogo Suppression on Space Shuttle - Early Studies. NASA CR-2210, (NAS1-10631 The Aerospace Corporation), 1973.

Anon.: Sensitivity of Space Shuttle Weight and Cost to Structure Subsystem Weights. NASA CR-2164, (NAS1-11438, Lockheed Aircraft Corporation), 1973.

Zakkay, Victor: Reynolds Number and Mach Number Effects on Space Shuttle Configurations. NASA CR-132364, (NGR 33-016-179 New York University), 1973.

Spencer, Bernard, Jr.: Aerodynamic Stability and Control Characteristics of a Langley Concept Space Shuttle Orbiter (LO-100) at Mach Numbers of 0.35 to 1.2. NASA CR-128776, (NAS9-13247 Chrysler Corporation), 1973.

Spencer, Bernard, Jr.; and Fournier, Roger H.: Supersonic Stability and Control Characteristics of a Langley Concept Space Shuttle Orbiter (LO-100) at Mach Numbers of 1.5 to 4.63. NASA CR-128772, (NAS9-13247 Chrysler Corporation), 1973.

Spencer, B.; and Mennell, R.: Results of Transonic Tests in the NASA/LaRC 8-Foot Pressure Tunnel on a 0.015-Scale Model NR-PRR Space Shuttle Orbiter. NASA CR-128752, (NAS9-13247 Chrysler Corporation), 1973.

Spencer, B.; and Mennell, R.: Results of Supersonic Tests in the LaRC Unitary Plan Wind Tunnel on a 0.015-Scale Model NR-PRR Space Shuttle Orbiter. NASA CR-128753, (NAS9-13247 Chrysler Corporation), 1973.

B. Contractor Reports - Continued

Spencer, Bernard, J.; and Stone, David R.: Transonic Aerodynamic Characteristics Associated With Variations in the Geometry of the Forward Portion of Irregular Planform Wings. NASA CR-128781, (NAS9-13247 Chrysler Corporation), 1973.

Spencer, Bernard, Jr.; and Stone, David R.: Supersonic Aerodynamic Characteristics Associated With Variations in the Geometry of the Forward Portion of Irregular Planform Wings. NASA CR-128791, (NAS9-13247 Chrysler Corporation), 1973.

Stone, David R.: Static Aerodynamic Characteristics and Oil Flow and Electron Beam Illumination Results of a 0.005-Scale Model Langley Concept Space Shuttle Orbiter (LO-100) at a Mach Number of 20.3. NASA CR-128763, (NAS9-13247 Chrysler Corporation), 1973.

Stone, David R.; and Spencer, Bernard, Jr.: Aerodynamic and Flow-Visualization Studies Associated With Variations in the Geometry of the Forward Portion of Irregular Planform Wings at a Mach Number of 20.3. NASA CR-128775 (NAS9-13247 Chrysler Corporation), 1973.

Ware, George M.; and Spencer, Bernard, Jr.: Surface Roughness Effects on the Transonic Aerodynamics of the Rockwell International 089B-139 Orbiter. NASA CR-128773, (NAS9-13247 Chrysler Corporation), 1973.

Ware, George M.; and Spencer, Bernard, Jr.: Surface Roughness Effects on the Subsonic Aerodynamics of the Rockwell International 089B-139B Orbiter. NASA CR-128782, (NAS9-13247 Chrysler Corporation), 1973.

Ojalvo, I. U.; Auston, F.; and Levy, A.: Vibration and Stress Analysis of Soft-Bonded Shuttle Insulation Tiles: Modal Analysis With Compact Widely-Spaced Stringers. NASA CR-132553, (NAS1-10635-17 Grumman Aerospace Corporation), 1974.

Bernstein, M.; Coppolino, R.; Zalesak, J.; and Mason, P. W.: Development of Technology for Fluid-Structure Interaction Modeling of a 1/8-Scale Dynamic Model of the Shuttle External Tank (ET). NASA CR-132549, (NAS1-10635-13 Grumman Aerospace Corporation), 1974.

Burns, A. Bruce: Final Report for Structural Evaluation of Candidate Space Shuttle Thermal Protection Systems. NASA CR-132428, (NAS1-11153 Lockheed Missile and Space Company), 1974.

B. Contractor Reports - Continued

Chang, C. S.: Study of Providing Omnidirectional Vibration Isolation to Entire Space Shuttle Payload Packages. NASA CR-132550, (NAS1-12290 New Technology, Inc.), 1974.

Chipman, Richard R.; and Shyprykevich, Peter: Analysis of Wing-Body Interference Flutter for a Preliminary Space Shuttle Design. NASA CR-2329, (NAS1-10635-10 Grumman Aerospace Corporation), 1974.

Laakso, J. H.; and Straayer, J. W.: Evaluation of a Metal Shear Web Selectively Reinforced With Filamentary Composites for Space Shuttle Application. NASA CR-2409, (NAS1-10860 The Boeing Company), 1974.

Levy, A.; Zalesak, J.; Bernstein, M.; and Mason, P. W.: Development of Technology for Modeling of a 1/8-Scale Dynamic Model of the Shuttle Solid Rocket Booster (SRB). NASA CR-132492, (NAS1-10635-14 Grumman Aerospace Corporation), 1974.

Lock, M. H.; and Rubin, S.: Passive Suppression of Pogo on the Space Shuttle. NASA CR-132452, (NAS1-12215 The Aerospace Corporation), 1974.

Mason, P. W.; Harris, H. G.; Zalesak, J.; and Bernstein, M.: Analytical and Experimental Investigation of a 1/8-Scale Dynamic Model of the Shuttle Orbiter - Volume I - Summary Report. NASA CR-132488 (NAS1-10635-12 Grumman Aerospace Corporation), 1974.

Mason, P. W.: Harris, H. G.; Zalesak, J.; and Bernstein, M.: Analytical and Experimental Investigation of a 1/8-Scale Dynamic Model of the Shuttle Orbiter - Volume II - Technical Report. NASA CR-132489 (NAS1-10635-12 Grumman Aerospace Corporation), 1974.

Mason, P. W.; Harris, H. G.; Zalesak, J.; and Bernstein, J.: Analytical and Experimental Investigation of a 1/8-Scale Dynamic Model of the Shuttle Orbiter - Volume IIIA - Supporting Data. NASA CR-132490, (NAS1-10635-12 Grumman Aerospace Corporation), 1974.

Mason, P. W.; Harris, H. G.; Zalesak, J.; and Bernstein, M.; Analytical and Experimental Investigation of a 1/8-Scale Dynamic Model of the Shuttle Orbiter - Volume IIIB - Supporting Data. NASA CR-132491, (NAS1-10635-12 Grumman Aerospace Corporation), 1974.

B. Contractor Reports - Continued

Ojalvo, I. E.; Levy, A.; and Austin, F.: Thermal Stress Analysis of Reusable Surface Insulation for Shuttle. NASA CR-132502, (NAS1-10635-19 Grumman Aerospace Corporation), 1974.

Wennhold, W. F.: Evaluation of a Metal Fuselage Panel Selectively Reinforced With Filamentary Composites for Space Shuttle Application - Final Report. NASA CR-132380, (NAS1-10766 General Dynamics Corporation), 1974.

Baer, J. W.; and Black, W. E.: Evaluation of Coated Columbium Alloy Heat Shields for Space Shuttle Thermal Protection System Application - Volume III, Phase III - Full Size TPS Evaluation. NASA CR-112119-3, (NAS1-9793 General Dynamics Corporation), 1974.

DaForno, G.; Graham, J.; Roy, P.; and Rose, L.: Initial Development of an Ablative Leading Edge for the Space Shuttle Orbiter. NASA CR-132379, (NAS1-11416 Grumman Aerospace Corporation) 1974.

Miller, Christopher; and Rummel, Ward D.: Investigation of Critical Defects in Ablative Heat Shield Systems for Space Shuttle Applications. NASA CR-2336, (NAS1-10289 Martin Marietta Corporation), 1974.

Miller, Robert C.; and Clure, John L.: Metal-Wood Heat Shields for Space Shuttle. NASA CR-132389, (NAS1-12427 Summa Corporation), 1974.

Oken, S.; Skoumal, D. E.; and Straayer, J. W.: Evaluation of a Metal Fuselage Frame Selectively Reinforced With Filamentary Composites for Space Shuttle Application. NASA CR-132519, (NAS1-10797 Boeing Aerospace Company), 1974.

Ashby, George C., Jr.: Effects of Surface Roughness on the Aerodynamic Characteristics of the Modified 089B Shuttle Orbiter at Mach 6. NASA CR-134083, (NAS9-13247 Chrysler Corporation), 1974.

Dea, T. J.; Carlson, J. A.; Reynolds, L. H.; Davies, L. L.; Clayton, J. L.; Liu, W.; Miyakawa, T. T.; and Theumer, A. Von: Shuttle Sortie Electro-Optical Instruments Study. NASA CR-132457, (NAS1-12710 Xerox, Electro-Optical Systems), 1974.

B. Contractor Reports - Continued

Dunavant, James C.: Effect of Wall to Total Temperature Ratio Variation on Heat Transfer to the Leeside of a Space Shuttle Configuration at M = 10.3. NASA CR-134086, (NAS9-13247 Chrysler Corporation), 1974.

Maslen, S. H.: Development of a Method of Analysis and Computer Program for Calculating the Inviscid Flow About the Windward Surfaces of Space Shuttle Configurations at Large Angles of Attack. NASA CR-132453, (NAS1-11604 Martin Marietta Corporation), 1974.

Powell, Richard W.; and Ware, George M.: Supersonic Performance, Stability and Control Characteristics of a 0.01875-Scale Model Rockwell International 089B-133B Orbiter Configuration. NASA CR-134080, (NAS9-13247 Chrysler Corporation), 1974.

Zakkay, V.; Miyazawa, M.; and Wang, C. R.: Lee Surface Flow Phenomena Over Space Shuttle at Large Angles of Attack at $M_\infty = 6$. NASA CR-132501, (NGR 33-016-179 New York University), 1974.

Lake, E. R.: A Study of the Feasibility of Directly Applying Gas Generator Systems to Space Shuttle Mechanical Functions. NASA CR-2454, (NAS1-11740 McDonnell Douglas Corporation), 1974.

Lanham, C. C., Jr.: Langley Applications Experiments Data Management System Study, NASA CR-144888, (NAS1-13657 Aeronutronic Ford Corporation), 1975.

Welch, J. D.: A Landmark Recognition and Tracking Experiment for Flight on the Shuttle/Advanced Technology Laboratory (ATL). NASA CR-144906, (NAS1-12550, General Electric Company), 1975.

Foust, J. W.: Entry Heat Transfer Tests of the 0.006-Scale Space Shuttle Orbiter Model (50-0) in Langley Research Center Freon Tunnel at Mach 6 (OH45). NASA CR-141527, (NAS9-13247, Chrysler Corporation), 1975.

Zalesak, J.: Modal Coupling Procedures Adapted to NASTRAN Analysis of 1/8-Scale Shuttle Structural Dynamics Model - Volume II - Supporting Data. NASA CR-132667, (NAS1-10635-21 Grumman Aerospace Corporation), 1975.

Chipman, Richard R.; and Rauch, Frank J.: Analytical and Experimental Study of the Effects of Wing-Body Aerodynamic Interaction on Space Shuttle Subsonic Flutter. NASA CR-2488, (NAS1-10635-18, Grumman Aerospace Corporation), 1975.

B. Contractor Reports - Continued

Ball, George L., III; Leffingwell, James W.; Salyer, Ival O.; and Werkmeinster, Dennis S.: High Temperature Polyimide Foams for Shuttle Upper Surface Thermal Insulation. NASA CR-132572, (NAS1-12990 Monsanto Research Corporation), 1975.

Davis, J. W.; and Cramer, B. A.: Prediction and Verification of Creep Behavior in Metallic Materials and Components for the Space Shuttle Thermal Protection System, Volume I, Phase I - Cyclic Material Creep Predictions. NASA CR-132605-1, (NAS1-11774 McDonnell Douglas Astronautics Company), 1975.

Cramer, B. A.; and Davis, J. W.: Prediction and Verification of Creep Behavior in Metallic Materials and Components for the Space Shuttle Thermal Protection System, Volume II, Phase II - Subsize Panel Cyclic Creep Prediction. NASA CR-132605-2, (NAS1-11774 McDonnell Douglas Corporation), 1975.

Schaefer, John C.; Tong, Henry; Clark, Kimble J.; Suschland, Kurt E.; and Neuner, Gary J.: Analytic and Experimental Evaluation of Flowing Air Test Conditions for Selected Metallics in a Shuttle TPS Application. NASA CR-2531, (NAS1-10913 Acurex Corporation), 1975.

Sieferth, Rolf W.: Ablative Heat Shield Design for Space Shuttle. NASA CR-132282, (NAS1-11592 Martin Marietta Corporation) 1975.

Sieferth, Rolf W.: Ablative Heat Shield Design for Space Shuttle. NASA CR-2579, (NAS1-11592 Martin Marietta Corporation), 1975.

Anon.: Evaluation of Dispersion-Strengthened Nickel-Base Alloy Heat Shields for Space Shuttle Application, Phase II - Summary Report. NASA CR-132615, (NAS1-11654 McDonnell Douglas Astronautics Company), 1975.

Pergament, H. S.; and Thorpe, R. D.: NO_x Deposited in the Stratosphere by the Space Shuttle. NASA CR-132715, (NAS1-13544 AeroChem Research Laboratories, Inc.), 1975.

Thomas, William L.: Ditching Investigation of a 1/20-Scale Model of the Space Shuttle Orbiter. NASA CR-2593, (NAS1-10635-20 Grumman Aerospace Corporation), 1975.

B. Contractor Reports - Continued

Zalesak, J.: Modal Coupling Procedures Adapted to NASTRAN Analysis of 1/8-Scale Shuttle Structural Dynamics Model - Volume I - Technical Report. NASA CR-132666, (NAS1-10635-21 Grumman Aerospace Corporation), 1975.

Ball, J. W.; and Lindahl, R. H.: Shuttle Model Tailcone Pressure Distribution in Low Subsonic Speeds of a 0.03614-Scale Model in the NASA/LaRC Low-Turbulence Pressure Tunnel (LA81), Volume 1. NASA CR-147609, (NAS9-13247 Chrysler Corporation), 1976.

Ball, J. W.; and Lindahl, R. H.: Shuttle Model Tailcone Pressure Distribution at Low Subsonic Speeds of a 0.03614-Scale Model in the NASA/LaRC Low-Turbulence Pressure Tunnel (LA81), Volume 2, NASA CR-147610, (NAS9-13247 Chrysler Corpora ion), 1976.

Ball, J. W.; and Lindahl, R. H.: Upper Wing Surface Boundary Layer Measurements and Static Aerodynamic Data Obtained on a 0.015-Scale Model (42-0) or the SSV Orbiter Configuration 140A/B in the LaRC V HSWT at a Mach Number of 4.6 (LA58). NASA CR-144592, (NAS9-13247 Chrysler Corporation), 1976.

Ball, J. W.; and Klug, G. W.: Results From Investigations in Three NASA/LaRC Hypersonic Wind Tunnels on a 0.004-Scale Model Space Shuttle Orbiter (Model 13P-0) to Determine Real Gas Effects (LA78, LA87, LA88). NASA CR-147620, (NAS9-13247 Chrysler Corporation), 1976.

Anon.: Low-Subsonic Stability and Control Characteristics of a 0.015-Scale Remotely Controlled Elevon Model (44-0) of the Space Shuttle Orbiter in the Langley Research Center Low Turbulence Pressure Tunnel (LA61B). NASA CR-147629, (NAS9-13247, Chrysler Corporation), 1976.

Ball, J. W.; and Edwards, C. R.: Transonic Stability and Control Characteristics of a 0.015-Scale Model 69-0 of the Space Shuttle Orbiter With Forebody RSI Modification in the NASA/LaRC 8-Foot TPT (LA72). NASA CR-147644, (NAS9-13247 Chrysler Corporation), 1976.

Ball, J. W.: High Supersonic Stability and Control Characteristics of a 0.015-Scale (Remotely Controlled Elevon) Model 44-0 Space Shuttle Orbiter Tested in the NASA/LaRC 4-Foot UPWT (Leg 2) (LA75), Volume 1. NASA CR-147646, (NAS9-13247 Chrysler Corporation), 1976.

B. Contractor Reports - Continued

Ball, J. W.: High Supersonic Stability and Control Characteristics of a 0.015-Scale (Remotely Controlled Elevon) Model 44-0 Space Shuttle Orbiter Tested in the NASA/LaRC 4-Foot UPWT (Leg 2) (LA74), Volume 2. NASA CR-147647, (NAS9-13247 Chrysler Corporation), 1976.

Ojalvo, Irving U.; and Ogilvie, Patricia L.: Modal Analysis and Dynamic Stresses for Acoustically Excited Shuttle Insulation Tiles. NASA CR-1444958, (NAS1-10635-1 Grumman Aerospace Corporation), 1976.

Davis, J. W.; and Cramer, B. A.: Prediction and Verification of Creep Behavior in Metallic Materials and Components for the Space Shuttle Thermal Protection System. NASA CR-2685, (NAS1-11774 McDonnell Douglas Astronautics Company), 1976.

Johnson, R.; and Killpatrick, D. H.: Evaluation of Dispersion-Strengthened Nickel-Base Alloy Heat Shields for Space Shuttle Application. NASA CR-2614, (NAS1-11654 McDonnell Douglas Corporation), 1976.

Hwang, Baochuan; and Pergament, Harold S.: Environmental Effects of Space Shuttle Solid Rocket Motor Exhaust Plumes. NASA CR-145079, (NAS1-14271 AeroChem Corporation), 1976.

McNeilly, W. R.: Advanced Shuttle Payload Sizing Study. NASA CR-132714, (NAS1-12436 McDonnell Douglas Corporation), 1976.

Pergament, Harold S.; Thorpe, Roger D.; and Hwang, Baochuan: NO_x Deposited in the Stratosphere by the Space Shuttle Solid Rocket Motors. NASA CR-144928 (NAS1-13544 AeroChem Research Laboratory, Inc.), 1976.

Goldstein, H. W.; and Grenda, R. N.: A Study of Selected Environmental Quality Remote Sensors for Free Flyer Missions Launched From the Space Shuttle. NASA CR-145252, (NAS1-13815 General Electric Company), 1977.

Abrahamson, A. L.; and Osinski, John: Resonance Testing of Space Shuttle Thermoacoustic Structural Specimen. NASA CR-145154, (NAS1-12841 Wyle Laboratories), 1977.

Ojalvo, I. U.: Stresses in Acoustically Excited Panels and Shuttle Insulation Tiles. NASA CR-145222, (NAS1-10635 T. 17 Grumman Aerospace Corporation), 1977.

B. Contractor Reports - Continued

Black, W. E.: Summary Report of Evaluation of Coated Columbium Alloy Heat Shields for Space Shuttle Thermal Protection System Application. NASA CR-2824, (NAS9-9793 General Dynamics Corporation), 1977.

Huggerd, William L.: Measured Properties of Propellant for Solid Rocket Booster of 1/8-Scale Dynamic Shuttle Model (Revised). NASA CR-144938, (NSG-1113 University of Utah), 1977.

Wolf, H.; and Eades, J. B., Jr.: Analysis of the Shuttle Air Data System. NASA CR-145279, (NAS1-14466 Analytical Mechanics Associates, Inc.), 1977.

Pennington, D. F.; Man, T.; and Persons, B.: Rocket Propulsion Hazard Summary: Safety Classification, Handling Experience and Application to Space Shuttle Payload. NASA CR-145185, (NAS1-12500 Task R-150 Vought Corporation), 1977.

Geissler, W. H.: A Feasibility Study of Orbiter Flight Control Experiments. NASA CR-158952, (NAS1-15141 McDonnell Douglas Technical Services Company, Inc.), 1978.

Friedman, E.; Carmichael, J.; and Gupta, J.: Shuttle Applications in Tropospheric Air Quality Experiments. NASA CR-145374 (The MITRE Corporation), 1978.

Thorpe, Roger D.: Definition of Air Quality Measurements for Monitoring Space Shuttle Launches. NASA CR-2942, (NAS1-14511 AeroChem Research Laboratories, Inc.), 1978.

Qualls, G. L.; Kress, S. S.; Storey, W. W.; and Ransdell, P. N.: Environmental Protection Requirements for Scout/Shuttle Auxiliary Stages. NASA CR-3328 (Vought Corporation), 1980.

C. ARTICLES AND CONFERENCES

C. Articles and Conferences

Henry, J. R.; and McLellan, C. H.: The Air-Breathing Launch Vehicle for Earth-Orbit Shuttle - New Technology and Development Approach. AIAA Advanced Space Transportation Meeting, (Cocoa Beach, Florida), AIAA Paper 70-369, February 4-6, 1970.

Brooks, D. R.; Pritchard, E. B.; and Staylor, W. F.: Analysis of the Requirements and Capabilities of Interorbital Shuttles. AIAA Advanced Space Transportation Meeting, (Cocoa Beach, Florida), AIAA Paper 70-267, February 4-6, 1970. Journal of Spacecraft and Rockets, Vol. 7, pp. 814-818.

Blackstock, T. A.: A Ferry Package for Transporting Reusable Spacecraft and Launch Vehicles. AIAA Advanced Space Transportation Meeting, (Cocoa Beach, Florida), AIAA Paper 70-259, February 4-6, 1970. Journal of Spacecraft and Rockets, Vol. 7, pp. 1121-1123.

Morgan, H. G.; and Runyan, H. L.: Structural Dynamic Problems of the Space Shuttle. 11th AIAA/ASME, Structures, Structural Dynamics, and Materials Conference, (Denver, Colorado), AIAA Paper 70-740, April 22-24, 1970.

Brooks, W. A., Jr.; and Vosteen, L. F.: An Assessment of Structures and Thermal Protection System Technology for a Space Shuttle System. 11th AIAA/ASME Structures, Structural Dynamics, and Materials Conference, (Denver, Colorado), April 22-24, 1970. Proceedings. Volume 3, Space Shuttle Status. pp. 9-17.

Holloway, P. F.; and Pritchard, E. B.: Atmospheric Maneuvers for Space Shuttles. American Astronautical Society, 16th Annual Meeting, (Anaheim, California) AAS Paper 70-047, June 8-10, 1970.

Rainey, R. W.: Progress in Technology for Space Shuttles. American Astronautical Society, 16th Annual Meeting, (Anaheim, California), AAS Paper 70-046, June 8-10, 1970.

Decker, John P.; McGehee, Robert J.; and Pierpont, P. Kenneth: Abort Separation Including Aerodynamic, Dynamic, and Trajectory Influences. Space Transportation System Technology Symposium, NASA Lewis Research Center, (Cleveland, Ohio), July 15-17, 1970.

C. Articles and Conferences - Continued

Hamilton, H. Harris: Turbulent Heating on Space Shuttle Orbiters During Reentry. Space Transportation System Technology Symposium, NASA Lewis Research Center, (Cleveland, Ohio), July 15-17, 1970.

Arrington, James P. Entry Maneuver/Aerothermodynamic Interactions for High Cross-Range Candidate Orbiters. Space Transportation System Technology Symposium, NASA Lewis Research Center, (Cleveland, Ohio), July 15-17, 1970.

Runyan, H. L.: Introductory Statement: Volume II - Dynamics and Aeroelasticity. Space Transportation System Technology Symposium, NASA Lewis Research Center, (Cleveland, Ohio), July 15-17, 1970.

Leonard, H. W.; and Morgan, H. G.: Application of Dynamic Models. Space Transportation System Technology Symposium, NASA Lewis Research Center, (Cleveland, Ohio), July 15-17, 1970.

Walton, W. C., Jr.; Naumann, E. C.: Panel Vibration and Random Loads. Space Transportation System Technology Symposium, NASA Lewis Research Center, (Cleveland, Ohio), July 15-17, 1970.

Reed, W. H. III: Ground-Wind-Load Considerations for Space Shuttle Vehicles. Space Transportation System Technology Symposium, NASA Lewis Research Center, (Cleveland, Ohio), July 15-17, 1970.

Goetz, R. C.· Lifting and Control Surface Flutter. Space Transportation System Technology Symposium, NASA Lewis Research Center, (Cleveland, Ohio), July 15-17, 1970.

Dixon, S. D.; and Shore, C. P.: State of the Art for Panel Flutter as Applied to Space Shuttle Heat Shields. Space Transportation System Technology Symposium, NASA Lewis Research Center, (Cleveland, Ohio), July 15-17, 1970.

Osborne, R. S.; and Clark, L. G.: Integrated Life Support Systems for the Space Shuttle. Space Transportation System Technology Symposium, NASA Lewis Research Center, (Cleveland, Ohio), July 15-17, 1970.

Anderson, Roger A.: Introductory Statement. Volume III - Structures and Materials. Space Transportation System Technology Symposium, NASA Lewis Research Center, (Cleveland, Ohio), July 15-17, 1970.

C. Articles and Conferences - Continued

Leonard, R. W.: Introduction and Overview. Structural Design Technology. Space Transportation System Technology Symposium, NASA Lewis Research Center, (Cleveland, Ohio), July 15-17, 1970.

Vosteen, L. F.: Space Shuttle Structural Design Criteria Development. Space Transportation System Technology Symposium, NASA Lewis Research Center, (Cleveland, Ohio), July 15-17, 1970.

Pride, Richard A.; and Card, Michael F.: Applications of Advanced Composite Materials to Space Shuttle Structures. Space Transportation System Technology Symposium, NASA Lewis Research Center, (Cleveland, Ohio), July 15-17, 1970.

Brooks, W. A. Jr.: Introduction and Overview. Thermal Protection Systems. Space Transportation System Technology Symposium, NASA Lewis Research Center, (Cleveland, Ohio), July 15-17, 1970.

Stein, Bland A.; Rummler, Donald R.; and Jackson, L. Robert: Refractory Metal Heat Shield Technology for Space Shuttle. Space Transportation System Technology Symposium, NASA Lewis Research Center, (Cleveland, Ohio), July 15-17, 1970.

Swann, R. T.: Low-Cost Ablative Heat Shields. Space Transportation System Technology Symposium, NASA Lewis Research Center, (Cleveland, Ohio), July 15-17, 1970.

Howell, R. R.: Test Facilities for Space Shuttle Thermal Protection System. Space Transportation System Technology Symposium, NASA Lewis Research Center, (Cleveland, Ohio), July 15-17, 1970.

Beasley, Gary P.; and Lewis, Charles M.: Crew and Cargo Transfer. Space Transportation System Technology Symposium, NASA Lewis Research Center, (Cleveland, Ohio), July 15-17, 1970.

Garrick, I. E.: Emerging Trends in Aeroelasticity. Zeitschrift Fuer Flugwissenschaften, Vol. 18, po. 314-320, October 1970.

Nicks, O. W.: OART Work Toward Shuttle and Research Highlights. Aerospace Management, Vol. 5, No. 1, pp. 41-49, 1970.

Reed, W. H., III; and Runyan, H. L.: Shuttle - Dynamics and Aeroelasticity - An Appraisal. Astronautics and Aeronautics, Vol. 9, pp. 48-57, February 1971.

C. Articles and Conferences - Continued

Anderson, R. A.; Brooks, W. A., Jr.; and Leonard, R. W.: Shuttle - Structures - A Technology Overview. Astronautics and Aeronautics, Vol. 9, pp. 26-36, February 1971.

Henderson, A., Jr.: Shuttle - Technology for Aerothermodynamics. Astronautics and Aeronautics, Vol. 9, pp. 26-36, February 1971.

Pecoraro, J. N.; Haues, E. L.; Hopson, G.; Osborne, R. S.; Carpenter, L. R.; Sadoff, M. and Ingelfinger, L.: Shuttle - Life Support, Protective Systems, and Crew System Interface Technology. Astronautics and Aeronautics, Vol. 9, pp. 58-63, February 1971.

Henderson, A., Jr.: Space Shuttle Aerothermodynamics - An Overview. 9th Course in Space Technique, Gottingen, West Germany, March 1-5, 1971.

Johnson, C. B.: Boundary-Layer Transition and Heating Criteria Applicable to Space Shuttle Configurations From Flight and Ground Tests. NASA Space Shuttle Technology Conference, NASA Langley Research Center, (Hampton, Va.), March 2-4, 1971.

Hunt, J. L.; and Creel, T. R., Jr.: Shock Interference Heating and Density-Ratio Effects: Part II - Hypersonic Density - Ratio Effects. NASA Space Shuttle Technology Conference, NASA Langley Research Center, (Hampton, Va.), March 2-4, 1971.

Hefner, J. N.; and Whitehead, A. H., Jr.: Lee-Side Heating Investigations: Part I - Experimental Lee-Side Heating Studies on a Delta-Wing Orbiter. NASA Space Shuttle Technology Conference, NASA Langley Research Center, (Hampton, Va.), March 2-4, 1971.

Powell, R. W.; Adams, J. J.; and Brown, L. W.: Control and Handling Qualities of Space Shuttle Orbiters. NASA Space Shuttle Technology Conference, NASA Langley Research Center, (Hampton, Va.), March 2-4, 1971.

Vosteen, L. F.; and Pittman, C. M.: Ablative Thermal Protection Systems. NASA Space Shuttle Technology Conference, NASA Langley Research Center, (Hampton, Va.), March 2-4, 1971.

McComb, Harvey G., Jr.: Structural Analysis and Automated Design. NASA Space Shuttle Technology Conference, NASA Langley Research Center, (Hampton, Va.), March 2-4, 1971.

C. Articles and Conferences - Continued

Leadbetter, S. A.; and Kiefling, L. A.: Recent Studies of Space Shuttle Multibody Dynamics. NASA Space Shuttle Technology Conference, NASA Langley Research Center, (Hampton, Virginia), March 2-4, 1971.

Garden, H. D.; Durling, B. J.; and Walton, W. C., Jr.: Space Shuttle TPS Panel Vibration Studies. NASA Space Shuttle Technology Conference, NASA Langley Research Center, (Hampton, Virginia), March 2-4, 1971.

Bugg, F. M.; and Land, N. S.: Space Shuttle Liquid Dynamics. NASA Space Shuttle Technology Conference, NASA Langley Research Center, (Hampton, Virginia), March 2-4, 1971.

Hanks, Brantley, R.; and Leland, T. J. W.: Some Landing-Gear Considerations for Space Shuttle Vehicles. NASA Space Shuttle Technology Conference, NASA Langley Research Center, (Hampton, Virginia), March 2-4, 1971.

Hess, R. W.; Reed, W. H. III; and Foughner, J. T., Jr.: Recent Studies of Effects of Ground Winds on Space Shuttle Vehicles. NASA Space Shuttle Technology Conference, NASA Langley Research Center, (Hampton, Virginia), March 2-4, 1971.

Goetz, R. C.: Effects of Space Shuttle Configuration on Wing Buffet and Flutter: Part I - Launch Vehicle Wing With Tip Fin. NASA Space Shuttle Technology Conference, NASA Langley Research Center, (Hampton, Virginia), March 2-4, 1971.

Bohon, H. L.; and Shore, C. P.: Application of Recent Panel Flutter Research to the Space Shuttle: Part II - Influence of Edge Clips and Flow Angularity. NASA Space Shuttle Technology Conference, NASA Langley Research Center, (Hampton, Virginia). March 2-4, 1971.

Coe, C. F.; Dods, J. B., Jr.; Robinson, R. C.; and Mayes, W. H.: Preliminary Measurements and Flow Visualization Studies of Pressure Fluctuations on Space Shuttle Configurations. NASA Space Shuttle Technology Conference, NASA Langley Research Center, (Hampton, Virginia), March 2-4, 1971.

Beasley, G. P.: Recent Results From Zero G Cargo Handling Studies. NASA Space Shuttle Operations, Maintenance, and Safety Technology Conference, (Phoenix, Arizona), March 15-18, 1971.

C. Articles and Conferences - Continued

Clark, L. G.; and Osborne, R. S.: Preliminary Results of Space Shuttle Environmental Control and Life Support Studies. NASA Space Shuttle Technology Conference, NASA Langley Research Center, (Hampton, Virginia), March 16-18, 1971.

Harrison, E. F.; and Pritchard, E. B.: Phobos/Deimos Missions. American Institute of Aeronautics and Astronautics, Space Systems Meeting, (Denver, Colorado), AIAA Paper 71-830, July 19-20, 1971.

Hausch, H. G.; and Stumm, J. E.: Configuring the Orbital Centrifuge Systems for Space Shuttle Compatibility. American Institute of Aeronautics and Astronautics and Aerospace Medical Association, Weightlessness and Artificial Gravity Meeting, (Williamsburg, Virginia), AIAA Paper 71-860, August 9-11, 1971.

Giles, G. L.; and Dutton, J. H.: Application of NASTRAN in the Analysis of a Space Shuttle Orbiter Structure. First NASTRAN Colloquium, NASA Langley Research Center, (Hampton, Virginia), September 13-15, 1971.

Bergmann, H. W.; Robinson, J. C.; and Adelman, H. M.: Analysis of a Hot Elevon Structure. First NASTRAN Colloquium, NASA Langley Research Center, (Hampton, Virginia), September 13-15, 1971.

Decker, J. P.; Blackwell, K. L.; Simms, J. L.; Burt, R. H.; Strike, W. T.; et al.: Abort Separation of the Shuttle. NASA Space Shuttle Aerothermodynamics Technology Conference, NASA Ames Research Center, (Moffett Field, California), December 15-16, 1971.

Hamilton, H. H.; DeJarnette, F.: Inviscid Surface Streamline Program for Use in Predicting Shuttle Heating Rates. NASA Space Shuttle Aerothermodynamics Technology Conference, NASA Ames Research Center, (Moffett Field, California), December 15-16, 1971.

Helms, Vernon T. III: Evaluation of Boundary Layer Transition Criteria for Space Shuttle Orbiter Entry. NASA Space Shuttle Aerothermodynamics Technology Conference, NASA Ames Research Center, (Moffett Field, California), December 15-16, 1971.

C. Articles and Conferences - Continued

Rehder, J. J.; and Holloway, P. F.: Orbiter Entry Trajectory Considerations. NASA Space Shuttle Aerothermodynamics Technology Conference, NASA Ames Research Center, (Moffett Field, California), December 15-16, 1971.

Scallion, W. I.; and Pratt, K. G.: Status of Langley Studies of Aerodynamics and Interface Effects of Tandem Launch Vehicles NASA Space Shuttle Aerothermodynamics Technology Conference, NASA Ames Research Center, (Moffett Field, California), December 15-16, 1971.

Throckmorton, D. A.: Heat Transfer Testing Procedures in Phase B Shuttle Studies With Emphasis on Phase-Change-Data Improvement. NASA Space Shuttle Aerothermodynamics Technology Conference, NASA Ames Research Center, (Moffett Field, California), December 15-16, 1971.

Rau, T. R.; and Elliott, J. R.: Optimal Lifting Ascent Trajectories for the Space Shuttle. NASA Space Shuttle Aerothermodynamics Technology Conference, NASA Ames Research Center, (Moffett Field, California), December 15-16, 1971.

Lordi, J. A.; Vidal, R. J.; and Johnson, C. B.: Chemical Nonequilibrium Effects on the Flow in the Windward Plane of Symmetry of a Blunted Delta Orbiter. NASA Space Shuttle Aerothermodynamics Technology Conference, NASA Ames Research Center, (Moffett Field, California), December 15-16, 1971.

Dunavant, J. C.: Introduction. Volume II - Heating. NASA Space Shuttle Aerothermodynamics Technology Conference. NASA Ames Research Center, (Moffett Field, California), December 15-16, 1971.

Johnson, C. B.: High Reynolds Number Turbulent Heating to Two Simplified Shuttle Configurations. NASA Space Shuttle Aerothermodynamics Technology Conference, NASA Ames Research Center, (Moffett Field, California), December 15-16, 1971.

Hefner, J. N.; and Whitehead, A. H., Jr.: Lee-Side Flow Phenomena on Space Shuttle Configurations at Hypersonic Speeds: Part II - Studies of Lee-Surface Heating at Hypersonic Mach Numbers. NASA Space Shuttle Aerothermodynamics Technology Conference, NASA Ames Research Center, (Moffett Field, California), December 15-16, 1971.

Henry, B. Z.: Introductory Remarks of Session Chairman. Volume III - Aerodynamics. NASA Space Shuttle Aerothermodynamics Technology Conference, NASA Ames Research Center, (Moffett Field, California), December 15-16, 1971.

C. Articles and Conferences - Continued

Freeman, D. C., Jr.; and Ellison, J. C.: Aerodynamic Studies of Delta-Wing Shuttle Orbiters: Part I - Low Speed. NASA Space Shuttle Aerothermodynamics Technology Conference, NASA Ames Research Center, (Moffett Field, California). December 15-16, 1971.

Stone, H. W.; and Arrington, J. P.: Aerodynamic Studies of Delta-Wing Shuttle Orbiters: Part II - Hypersonics. NASA Space Shuttle Aerothermodynamics Technology Conference, NASA Ames Research Center, (Moffett Field, California), December 15-16, 1971.

Henry, B. Z.: Summary Remarks of Session Chairman. NASA Space Shuttle Aerothermodynamics Technology Conference, NASA Ames Research Center, (Moffett Field, California), December 15-16, 1971.

Hains, F. D.; and Keyes, J. W.: Shock Interference Heating in Hypersonic Flows. American Institute of Aeronautics and Astronautics, 10th Aerospace Sciences Meeting, (San Diego, California), AIAA Paper 72-78, January 17-19, 1972.

Whitehead, A. H., Jr.; Hefner, J. N.; and Rao, D. M.: Lee-Surface Vortex Effects Over Configurations in Hypersonic Flow. American Institute of Aeronautics and Astronautics, 10th Aerospace Sciences Meeting, (San Diego, California) AIAA Paper 72-77, January 12-19, 1972.

Bird, J. D.; and Schaezler, A. D.: Aerospace Applications of Atmospheric Rendezvous. American Institute of Aeronautics and Astronautics, 10th Aerospace Sciences Meeting, (San Diego, California), AIAA Paper 72-134, January 17-19, 1972.

Goetz, R. C.: Flutter Technology for Space Shuttle. NASA Space Shuttle Technology Conference, (San Antonio, Texas), April 12-14, 1972.

Dixon, S. C.; Anderson, M. S.; and Stephens, W. B.: Assessment of Advances in Structural Analysis for Space Shuttle. NASA Space Shuttle Technology Conference, (San Antonio, Texas), April 12-14, 1972.

Card, M. F.; Davis, J. G., Jr.; and Shideler, J. L.: Advanced Design Concepts for Shuttle Airframe Structure. NASA Space Shuttle Technology Conference, (San Antonio, Texas), April 12-14, 1972.

C. Articles and Conferences - Continued

Dow, M. B.; Tompkins, S. S.; and Coe, F.: Materials and Design for Ablative Heat Shields. NASA Space Shuttle Technology Conference, (San Antonio, Texas), April 12-14, 1972.

Pittman, C. M.; and Brewer, W. D.: Ablator Manufacturing. NASA Space Shuttle Technology Conference, (San Antonio, Texas), April 12-14, 1972.

Stein, B. A.; Bohon, H. L.; and Rummler, D. R.: An Assessment of Radiative Metallic Thermal Protection System Program for Space Shuttle. NASA Space Shuttle Technology Conference, (San Antonio, Texas), April 12-14, 1972.

Fralich, R. W.; Green, C. D.; and Rheinfurth, M. H.: Dynamic Analysis for Shuttle Design Verification. NASA Space Shuttle Technology Conference, (San Antonio, Texas), April 12-14, 1972.

Stephens, D. B.; and Kiefling, L. A.: Liquid-Propellant Dynamics and Suppression. NASA Space Shuttle Technology Conference, (San Antonio, Texas), April 12-14, 1972.

Pinson, L. D.; and Harbison, J. E.: Overview of Technology Relative to the POGO Instability on Space Shuttle. NASA Space Shuttle Technology Conference, (San Antonio, Texas), April 12-14, 1972.

Green, C. E.; Leadbetter, S. A.; and Rheinfurth, M. H.: Dynamic Testing for Shuttle Design Verification. NASA Space Shuttle Technology Conference, (San Antonio, Texas), April 12-14, 1972.

Goldstein, H. E.; Buckley, J. D.; King, H. M.; Probst, H. B.; and Spiker, I. K.: Reusable Surface Insulation Materials Research and Development. NASA Space Shuttle Technology Conference, (San Antonio, Texas), April 12-14, 1972.

Whitehead, A. H., Jr.; Sterrett, J. R.; and Emery, J. C.: Effects of Transverse Outflow From a Hypersonic Separated Region. AIAA Journal, Vol. 10, pp. 553-555, April 1972.

Campbell, J. W.: The Effect on Random Fluctuations in Atmospheric Density on Significant Space Shuttle Reentry Parameters. 1st International Conference on Aerospace and Aeronautical Meteorology, Washington, D. C., May 22-23, 1972.

C. Articles and Conferences - Continued

DeJarnette, F. R.; and Hamilton, H. H.: Inviscid Surface Streamlines and Heat Transfer on Shuttle-Type Configurations. American Institute of Aeronautics and Astronautics, 5th Fluid and Plasma Dynamics Conference (Boston, Massachusetts), AIAA Paper 72-703, June 26-28, 1972.

Cunningham, H. J.: Panel-Flutter Analysis of a Thermal Protection-Shield Concept for the Space Shuttle. AIAA Journal, Vol. 10, pp. 1101-1103, August 1972.

Keyes, J. W.; and Morris, D. J.: Correlations of Peak Heating in Shock Interference Regions at Hypersonic Speeds. Journal of Spacecraft and Rockets, Vol. 9, pp. 621-623, August 1972.

Runyan, H. L.; and Goetz, R. C.: Space Shuttle - A New Arena for the Structural Dynamicists. In Dynamic Response of Structures. Proceedings of the Symposium, (Stanford, California), pp. 115-138, 1972.

Woods, W. C.; and Arrington, J. P.: Electron-Beam Flow Visualization - Applications in the Definition of Configuration Aerothermal Characteristics. American Institute of Aeronautics and Astronautics, 7th Aerodynamic Testing Conference, (Palo Alto, California), AIAA Paper 72-1016, September 13-15, 1972.

Hefner, J. N.; and Sterrett, J. R.: Secondary Jet Interaction With Emphasis on Outflow and Jet Location. Journal of Spacecraft and Rockets, Vol. 9, pp. 845-847, November 1972.

Vosteen, L. F.; Greenshields, D. H.; and Larson, H. K.: Shuttle Thermal Protection Systems. AIAA Ninth Annual Meeting and Technical Display, (Washington, D.C.), January 1973.

Henderson, Arthur, J.: Aerothermodynamic Technology for Space Shuttle - And Beyond. AIAA Ninth Annual Meeting and Technical Display, (Washington, D.C.), January 1973.

Love, E. S.: Advanced Technology and the Space Shuttle. 10th Von Karman Lecture. AIAA Ninth Annual Meeting and Technical Display, (Washington, D.C.), January 1973.

C. Articles and Conferences - Continued

Black, W. E.; and Rummler, D. R.: Evaluation of Columbium Alloy Thermal Protection Systems for Space Shuttle. AIAA, ASME, and SAE, 14th Structures, Structural Dynamics and Materials Conference, (Williamsburg, Virginia) March 20-22, 1973.

Chapman, Andrew J.: Entry Heating Tests of Reusable Surface Insulation for the Space Shuttle. American Ceramic Society - 75th Annual Meeting, (Cincinnati, Ohio), April 29-May 3, 1973.

Swann, R. T.; Tompkins, S. S.; Chapman, A. J.; and Brown, R. D.: Space Shuttle TPS Testing at NASA Langley Research Center. 18th National SAMPE Symposium,(Los Angeles, California), April 1973.

DeJarnette, Fred. R.; and Hamilton, H. Harris, II: Inviscid Surface Streamlines and Heat Transfer on Shuttle-Type Configurations. Journal of Spacecraft and Rockets, May 1973.

Holloway, Paul F.: Long Range Objectives in Space. 49th Annual Convention of Virginia Engineering and Technical Societies, (Hampton, Virginia) June 1973.

Rucker, C. E.; and Grandle, R. E.: Thermoacoustic Fatigue Testing Facility for Space Shuttle Thermal Protection System. In Fatigue at Elevated Temperatures, (Storrs, Connecticut), June 18-23, 1972. Proceedings of the Symposium, 1973, pp. 255-263.

Sivertson, W. E., Jr.: A Shuttle Compatible Advanced Technology Laboratory. AIAA/ASME/SAE Joint Space Mission Planning and Execution Meeting, (Denver, Colorado), July 1973.

Daforno, G.; Graham, J.; and Tompkins, S.: Initial Development of an Ablative Leading Edge for the Space Shuttle Orbiter. 8th AIAA Thermophysics Conference, (Palm Springs, California), AIAA Paper 73-739, July 16-18, 1973.

Basiulis, A.; Ballonardo, C. M.; and Kendall, B. M.: Heat Pipe System for Space Shuttle TWTA. 8th AIAA Thermophysics Conference, (Palm Springs, California), July 16-18, 1973.

Creel, T. R., Jr.: Mach Number and Reynolds Number Effect on Orbiter/Tank Interference Heating. Journal of Spacecraft and Rockets, Vol. 10. pp. 535-537, August 1973.

Helms, Vernon T., III: Approximation for Maximum Centerline Heating on Lifting Entry Vehicles. Journal of Spacecraft and Rockets, Vol. 10, No. 9, pp. 599-601, September 1973.

C. Articles and Conferences - Continued

Hook, W. Ray: Advanced Technology Laboratory Interface Considerations. Second Conference on Payload Interfaces With Shuttle and Tug. (Long Beach, California), September 1973.

Rehder, J. J.: Correlation of Hypersonic Zero-Lift Drag Data. Journal of Spacecraft and Rockets, Vol. 10, No. 9, pp. 622-623, September 1973.

Holloway, Paul F.: Shuttle Technology Payload. Martin Marietta Institute Science and Applications Payload Lecture Series, (Denver, Colorado), October 1973.

Love, Eugene S.: Space Shuttle. Dayton-Cincinnati Section of AIAA, (Ohio), October 1973.

Holloway, P. F.; Wilhold, G. A.; Jones, J. H.; Garcia, F., Jr.; and Hicks, R. M.: Shuttle Sonic Boom - Technology and Predictions. AIAA Aero-Acoustics Conference, (Seattle, Washington) AIAA Paper 73-1039, October 15-17, 1973.

Grandle, R. E.; and Leadbetter, Sumner A.: Vibration Tests of Candidate Reusable Surface Insulation Tiles for Space Shuttle. Society for Experimental Stress Analysis, Fall Meeting, (Indianapolis, Indiana) SESA Paper 2244A, October 16-19, 1973.

Rucker, Carl E.; and Grandle, Robert E.: Testing of Space Shuttle Thermal Protection System Panels Under Simulated Reentry Thermoacoustic Conditions. 7th Space Simulation Conference, (Los Angeles, California), November 12-14, 1973.

Henderson, Arthur, Jr.: The Space Shuttle. Central Virginia Section of ASME, (Richmond, Virginia), November 1973.

Jones, J. E.; and Richmond, J. H.: Application of an Integral Equation Formulation to the Prediction of Space Shuttle Annular Slot Antenna Radiation Patterns. IEEE Transactions on Antennas and Propagation, Vol. Ap-22, pp. 109-111, January 1974.

Rau, T. R.; and Decker, J. P.: ODIN - Optimal Design Integration System for Synthesis of Aerospace Vehicles. 12th AIAA Aero-Space Sciences Meeting, (Washington, D.C.), AIAA Paper 74-72, January 30-February 1, 1974.

C. Articles and Conferences - Continued

Hefner, J. N.: Vortex-Induced Heating to a Cone-Cylinder Body at Mach 6. Journal of Spacecraft and Rockets, Vol. 11, pp. 127-128, February 1974.

Rummler, D. R.: Application of Explicit Descriptions of Creep Behavior to Design of Space Shuttle Thermal Protection Systems. ASTM, ASME, and IME, International Conference on Creep and Fatigue in Elevated Temperature Applications, (Sheffield, England), April 1-5, 1974.

Chipman, R. R.; Rauch, F. J.; Shyprykevich, P.; and Hess, R. W.: Space Shuttle Flutter as Affected by Wing-Body Aerodynamic Interaction. AIAA/ASME/SAE 15th Structures, Structural Dynamics, and Materials Conference, (Las Vegas, Nevada), April 1974.

DeJarnette, F. R.; and Hamilton, H. H.: Aerodynamic Heating on 3-D Bodies Including the Effects of Entropy-Layer Swallowing. 7th AIAA Fluid and Plasma Dynamics Conference, (Palo Alto, California), AIAA Paper 74-602, June 17-19, 1974.

Dunavant, James C.; and Throckmorton, David A.: Aerodynamic Heat Transfer to RSI Tile Surfaces and Gap Intersections. Journal of Spacecraft and Rockets, Vol. 11, No. 6, pp. 437-440, June 1974.

Keckler, C. R.; and Jacobs, K. L.: A Spacecraft Integrated Power/Attitude Control System. 9th Intersociety Energy Conversion Engineering Conference, (San Francisco, California) August 26-30, 1974. Proceedings, American Society of Mechanical Engineers, pp. 20-25, 1974.

Holloway, Paul F.: NASA Space Shuttle Program. NASA Space Science Education Conference, (Hampton, Virginia), September 1974.

Hook, W. R.: Shuttle and Spacelab - The Promise for Advanced Technology. EASCON '74, Electronics and Aerospace Systems Convention, (Washington, D.C.), October 7-9, 1974. Institute of Electrical and Electronics Engineers, Inc. pp. 2-2G, 1974.

C. Articles and Conferences - Continued

Pinson, L. D.; and Stephens, D. G.: Space Payload Dynamic Testing. In Reliability Design for Vibroacoustic Environments; Proceedings of the Winter Annual Meeting, (New York, New York), November 17-21, 1974. American Society of Mechanical Engineers, pp.173-187, 1974.

Martin, J. A.: Optimal Payload Ascent Trajectories of Winged Vehicles. Journal of Spacecraft and Rockets, Vol. 11, No. 12, pp. 860-862, December 1974.

Decker, J. P.; and Wilhite, A. W.: Technology and Methodology of Separating Two Similar Size Aerospace Vehicles Within the Atmosphere. American Institute of Aeronautics and Astronautics, 13th Aerospace Sciences Meeting, (Pasadena, California), AIAA Paper 75-29, January 20-22, 1975.

Shideler, J. L.; Bohon, H. L.; and Greene, B. E.: Evaluation of Bead-Stiffened Metal Panels, 16th AIAA, ASME, and SAE, Structures, Structural Dynamics, and Materials Conference, (Denver, Colorado), AIAA Paper 75-815, May 27-29, 1975.

Rummler, D. R.; and Black, W. E.: Evaluation of Coated Columbium for Thermal Protection Systems Application. 16th AIAA, ASME, and SAE, Structures, Structural Dynamics, and Materials Conference, (Denver, Colorado), AIAA Paper 75-817, May 27-29, 1975.

Bess, T. D.: Humes, D. H.; and Brooks, D. R.: Effects of Meteoroid Impacts on Shuttle Reusable Thermal Insulation Material. AIAA 10th Thermophysics Conference, (Denver, Colorado), May 1975.

Huckins, E. K., III; Breedlove, W. J., Jr.; and Heinbockel, J.: Passive Three-Axis Stabilization of the Long Duration Exposure Facility. American Aeronautical Society and American Institute of Aeronautics and Astronautics, Astrodynamics Specialist Conference, (Nassau, Bahamas), AAS Paper 75-030, July 28-30, 1975.

Uselton, B. L.; Freeman, D. C., Jr.; and Boyden, R. P.: Experimental Pitch-, Yaw-, and Roll-Damping Characteristics of a Shuttle Orbiter at Mach Number 8. American Institute of Aeronautics and Astronautics, Aircraft Systems and Technology Meeting, (Los Angeles, California), AIAA Paper 75-1026, August 4-7, 1975.

C. Articles and Conferences - Continued

Llewellyn, C. P.; and Milliken, R. J.: The Advanced Technology Laboratory. AAS, AIAA, IEEE, ORSA, and IMS, Meeting on Space Shuttle Missions of the 80's, (Denver, Colorado), AAS Paper 75-250, August 26-28, 1975.

Youngblood, J. W.; Outlaw, R. A.; Melfi, L. T., Jr.; and McIlhaney, J. R.: An Orbiting Molecular Shield Vacuum Facility - A Materials Laboratory in Space. AAS, AIAA, IEEE, ORSA, and IMS, Meeting on Space Shuttle Mission of the 80's, (Denver, Colorado), AAS Paper 75-248, August 26-28, 1975.

Siemers, P. M., III: Shuttle Entry Technology Payloads. AAS, AIAA, IEEE, ORSA, and IMS, Meeting on Space Shuttle Missions of the 80's, (Denver, Colorado), AAS Paper 75-251, August 26-28, 1975.

DiBattista, J. D.: The Long Duration Exposure Facility - A Shuttle Transported Low Cost Technology Experiment Carrier. AAS, AIAA, IEEE, ORSA, and IMS, Meeting on Space Shuttle Missions of the 80's, (Denver, Colorado), AAS Paper 75-269, August 26-28, 1975.

Vetter, H. C.; McNeilly, W. R.; Siemers, P. M., III; and Nachtsheim, P. R.: Shuttle Launched Flight Tests: Supporting Technology for Planetary Entry Missions. American Institute of Aeronautics and Astronautics and American Geophysical Union Conference on the Exploration of the Outer Planets, (St. Louis, Missouri), AIAA Paper 75-1152, September 17-19, 1975.

Leadbetter, S. A.; Stephens, W. B.; Sewall, J. L.; Majka, J. W.; and Barrett, J. R.: Vibration Characteristics of the 1/8-Scale Dynamic Models of the Space Shuttle Solid Rocket Boosters. 46th Shock and Vibration Symposium, (San Diego, California), October 1975.

Bacchus, D. L.; Vickers, J. R.; and Foughner, J. T., Jr.: Wind Tunnel Investigation of Space Shuttle Solid Rocket Booster Drogue Parachutes and Deployment Concepts. American Institute of Aeronautics and Astronautics, 5th Aerodynamic Deceleraion Systems Conference, (Albuquerque, New Mexico), AIAA Paper 75-1366, November 17-19, 1975.

C. Articles and Conferences - Continued

DiBattista, John D.: A Space Shuttle Transported Low Cost Experiment Carrier. Stanford University, (Palo Alto, California), November 1975.

Poultney, S. K.; Levine, J. S.; and McIlrath, T. J.: Fluorescence LIDAR Studies of Upper Atmospheric Species From the Space Shuttle. 1975 International Conference on Laser Atmospheric Studies, (Menlo Park, California), November 1975.

Remsberg, E. E.; Gordley, L.; Poultney, S. K.; and Thompson, R. T.: Analysis of Differential Absorption LIDAR Measurements From Shuttle. 1975 International Conference on Laser Atmospheric Studies, (Menlo Park, California), November 1975.

Dunavant, J. C.; Walberg, G. D.; Narayan, K. T.: A Survey of Leeside Flow and Heat Transfer on Delta Planform Configurations. American Institute of Aeronautics and Astronautics, 14th Aerospace Sciences Meeting, (Washington, D. C.), AIAA Paper 76-118, January 26-28, 1976.

Garrick, I. E.: Aeroelasticity - Frontiers and Beyond. Von Karman Lecture. American Institute of Aeronautics and Astronautics, 12th Annual Meeting and Technical Display, (Washington, D. C.), AIAA Paper 76-219, January 28-30, 1976.

Morrisette, E. L.: Roughness Induced Transition Criteria for Space Shuttle-Type Vehicles. Journal of Spacecraft and Rockets, Vol. 13, pp. 118-120, February 1976.

Rucker, C. E.; and Mixson, J. S.: Vibroacoustic Testing of Space Shuttle Thermal Protection System Panels. 17th Structures, Structural Dynamics, and Materials Conference, (King of Prussia, Pennsylvania), May 5-7, 1976.

Stone, Howard W.; and Powell, Richard W.: Space Shuttle Orbiter Entry Guidance and Control System Sensitivity Analysis. American Institute of Aeronautics and Astronautics, Third Atmospheric Flight Mechanics Conference, (Arlington, Texas), June 7-9, 1976. Proceedings, 1976, pp. 169-175.

Kinard, W. H.: Long Duration Exposure Facility - A Multipurpose Free-Flying Experiment Carrier. American Astronautical Society Deutsche Gesellschaft Fuer Luft-Und Raumfahrt, International Meeting on Utilization of Space Shuttle and Spacelab, (Bonn, West Germany), June 2-4, 1976. Raumfahrtforschung, Vol. 20, September-October 1976, pp. 225-231.

C. Articles and Conferences - Continued

Sivertson, W. E., Jr.; Larson, R. W.; and Zelenka, J. S.: Space Shuttle Search and Rescue Experiment Using Synthetic Aperture Radar. Western Electronic Show and Convention (WESCON), (Los Angeles, California), September 1976.

Eldred, Charles H.; Rehder, John J.; and Wilhite, Alan W.: Nozzle Selection for Optimized Single-Stage Shuttles. XXVIIth International Astronautical Congress, (Anaheim, California), October 10-16, 1976.

Remsberg, Ellis E.; and Northam, G. Burton: Feasibility of Atmospheric Aerosol Measurements With Lidar From Space Shuttle. NASA/CSA Topical Meeting on Atmospheric Aerosols, Their Optical Properties and Effects, (Williamsburg, Virginia) December 1976.

Campbell, J. W.: Choosing Reliability Level for Shuttle-Carried Payloads. Astronautics and Aeronautics, Vol. 14, pp. 38-42, December 1976.

Pinson, Larry D.; and Leadbetter, Sumner A.: Results of 1/8-Scale Shuttle Model Vibration Studies. AIAA/ASME/SAE 18th Annual Structures, Structural Dynamics, and Materials Conference, (San Diego, California), March 21-23, 1977.

Sivertson, W. E., Jr.; Larson, R. W.; and Zelenka, J. S.: Space Shuttle Search and Rescue Experiment Using Synthetic Aperture Radar. Eleventh International Symposium on Remote Sensing of Environment, University of Michigan, (Ann Arbor, Michigan), April 25-29, 1977.

Remsberg, Ellis E.; and Gordley, Larry L.: Analysis of Differential Absorption Lidar From the Space Shuttle. Applied Optics, February 1978.

Compton, Harold R.; Blanchard, Robert C.; and Walberg, Gerald D.: An Experiment for Shuttle Aerodynamic Force Coefficient Determination From Inflight Dynamical and Atmospheric Measurements. AIAA 10th Aerodynamic Testing Conference, (San Diego, California), April 19-21, 1978.

Hanks, Brantley, R.: Improving Shuttle Payload Dynamic Response Prediction Through Flight Measurements. AIAA/ASME 19th Structures, Structural Dynamics and Materials Conference, (Bethesda, Maryland) April 3-5, 1978.

C. Articles and Conferences - Continued

Siemers, Paul M., III; and Larson, Terry J.: The Space Shuttle Orbiter and Aerodynamic Testing. AIAA 10th Aerodynamic Testing Conference, (San Diego, California), April 19-21, 1978.

Siemers, Paul M., III: Shuttle Entry Air Data System. 1978 Air Data Systems Conference, (Colorado Springs, Colorado), May 2-4, 1978.

Wilhite, Alan W.: Optimization and Evaluation of Main Liquid Rocket Propulsion Systems for Advanced Earth-to-Orbit Shuttles. AIAA/SAE 14th Joint Propulsion Conference, (Las Vegas, Nevada), July 25-27, 1978.

Martin, James A.: Econometric Comparisons of Liquid Rocket Engines for Dual-Fuel Advanced Earth-to-Orbit Shuttles. AIAA/SAE 14th Joint Propulsion Conference, (Las Vegas, Nevada), July 25-27, 1978.

Humes, Donald H.: Hypervelocity Impact Tests on Space Shuttle Orbiter RCC Thermal Protection Material. AIAA Journal of Spacecraft and Rockets, Vol. 15, No. 5, pp. 250-251, July-August 1978.

Brown, Lawrence, W.; and Moul, Martin T.: Shuttle Orbiter Flight Control System Evaluation. AFFDL Symposium and Workshop on Military Flying Qualities, (Dayton, Ohio), September 12-14, 1978.

Powell, Richard W.; Campbell, Janet W.; and Kanoy, Virginia M.: The Effect of Normal Atmospheric Variability on Space Shuttle Orbiter Entry Performance. AMS/AIAA Conference on Atmospheric Environment of Aerospace Systems and Applied Meteorology. (New York, New York), November 13-17, 1978.

Compton, Harold R.; Blanchard, Robert C.; and Findlay, John T.: Shuttle Entry Trajectory Reconstruction Using Inflight Accelerometer and Gyro Measurements. AIAA 17th Aerospace Sciences Meeting, (New Orleans, Louisiana), January 15-17, 1979.

Pinson, Larry D.; and Leadbetter, Sumner A.: Some Results From 1/8-Scale Shuttle Model Vibration Studies. AIAA Journal of Spacecraft and Rockets, January-February 1979.

C. Articles and Conferences - Continued

Lisagor, W. B.: Mechanical Property Degradation After Exposure to Moisture or Shuttle Orbiter Fluids. Presented at the CASTS Project Technical Symposium on Graphite/Polyimide Composites, NASA Langley, Hampton, Virginia, February 1979.

Browell, E. V.: NASA Shuttle Atmospheric Lidar Program. Presented at the 1979 Spring Meeting of the American Geophysical Union, Washington, D.C., May 1979.

Huesner, J. E.; Melfi, L. T.; Brock, F. J.; and Outlaw, R. A.: Direct Simulation Monte Carlo Method Applied to Shuttle Flow-Field Analysis. Presented at JANNAF 11th Plume Technology Meeting, Redstone Arsenal, Alabama, May 1979.

Browell, Edward V.: NASA Shuttle Atmospheric Lidar Program - Requirements/Applications for High Resolution Spectroscopy. Presented at the International Conference on Laser Spectroscopy (FICOLS), Rottach-Egern, Germany, June 1979.

Harrison, Edwin F.; Lawrence, George F.; and Lamkin, Stanley L.: Mission Analysis for Earth Atmospheric Measurements Using Solar Occultation Experiments on Shuttle Spacelabs. Presented at the 1979 AAS/AIAA Astrodynamics Specialists Conference, Provincetown, Massachusetts, June 1979.

Browell, Edward V.: NASA Shuttle Atmospheric Lidar Working Group Study. Presented at the Ninth International Laser Radar Conference, Munich, Germany, July 1979.

Camarda, Charles J.; and Masek, Robert V.: Design, Analysis, and Tests of a Shuttle-Type Heat-Pipe-Cooled Leading Edge. Presented at the Ninth Intersociety Conference on Environmental Systems, San Francisco, California, July 1979.

Harris, J. E.; and Browell, E. V.: Evolutionary Shuttle Atmospheric Lidar Program. Presented at the Ninth International Laser Radar Conference, Munich, Germany, July 1979.

Russell, P. B.; McCormick, M. P.; Swissler, T. J.; and Grams, G. W.: Proposed Use of a First-Generation Space-Shuttle Lidar in Aerosol, Cloud, and Ozone Studies. Presented at the Ninth International Laser Radar Conference, Munich, Germany, July 1979.

C. Articles and Conferences - Continued

Siemers, Paul M., III; and Larson, Terry J.: Space Shuttle Orbiter and Aerodynamic Testing AIAA Journal of Spacecraft and Rockets, July-August 1979.

Rindeman, E. C.; Langer, G.; Odencrantz, F. K.; and Gregory, G. L.: Laboratory Investigations of Cloud Nuclei From Combustion of Space Shuttle Propellant. J. Applied Meteorology, Vol. 19, No. 2, pp. 175-184, February 1980.

Lawrence, George F.; and Denn, Frederick M.: Mission Analysis for Earth Atmospheric Measurements Using a Shuttle-Spacelab Lidar System. Presented at the AIAA/AAS Astrodynamics Conference, Danvers, Massachusetts, AIAA Paper 80-1695, August 11-13, 1980.

Keckler, Claude R.: ASPS Performance With Large Payloads Onboard the Shuttle Orbiter. Presented at the AIAA Guidance and Control Conference, Danvers, Massachusetts, AIAA Paper 80-1779, August 11-13, 1980.

Russell, P. B.; Morley, B. M.; Grams, G. W.; McCormick, M. P; and Swissler, T. J.: Simulated Space Shuttle Lidar Measurements of Aerosols, Clouds, and Density. Presented at the 10th International Laser Radar Conference, Silver Spring, Maryland, October 6-9, 1980.

Miserentino, Robert; Pinson, Larry D.; and Leadbetter, Sumner A.: Vibration Characteristics of Space Shuttle Tile/Strain-Isolator-Pad. Presented at the 1980 SAE AErospace Congress and Exposition, Los Angeles, California, October 13-16, 1980.

APPENDIX A

SADSAC AND DATAMAN PUBLICATIONS

SADSAC Publications

Spencer, B. Jr.; and Ware, G. M.: Investigation of Subsonic Stability and Performance Characteristics of a Twin-Body Booster, DMS-DR-1015, September 1970.

Ware, G. M.; and Spencer, B., Jr.: Investigation of Subsonic Stability, Control and Performance Characteristics of the LRC Variable-Dihedral Orbiter, DMS-DR-1018, September 1970.

Phillips, P.; Spencer, B., Jr.; Mennell, R.; Parrell, H.: Reynolds Number Effects on the Low-Speed Aerodynamic Characteristics of the NAR Straight-Wing Orbiter, DMS-DR-1049, November 1971.

Ellison, J. C.; and Spencer, Bernard, Jr.: Longitudinal and Lateral-Directional Aerodynamic Characteristics - LaRC Model, MDAC Delta Wing Orbiter, DMS-DR-1149, December 1971.

Zombek, W.; and Spencer, B., Jr.: Aerodynamic Characteristics in Landing and Cruise Configurations - GD/C Space Shuttle Booster B-9U, DMS-DR-1150, December 1971.

Spencer, B.; and Phillips, W. P.: Determine Stability, Control and Performance of LMSC Delta Body - LMSC Delta Body Orbiter, DMS-DR-1157, February 1972.

Spencer, B.; and Phillips, W. P.: Determine Stall Characteristics as Influenced by Body and Fin Geometry Changes - LMSC Delta Body Orbiter, H. Drosdat, LMSC: DMS-DR-1169, April 1972.

Ware, G. M.; Spencer, B., Jr.; and Johannesen, B.: Low Speed Aerodynamic Characteristics - GAC Orbiter H-33, DMS-DR-1189, April 1972.

Freeman, D. C.; and Spencer, B., Jr.: Low Speed Aerodynamic Characteristics - Low Fineness Ratio Booster, DMS-DR-1193, May 1972.

Ware, G.; and Spencer, B., Jr.; and Johannesen, B.: Transonic Aerodynamic Characteristics - GAC H-33 Orbiter, DMS-DR-1195, June 1972.

Glass, Kirkbride; Ellison, J.; Spencer, B., Jr.; Whitnah, M.; and Hillje, E.: Aerodynamic Characteristics at Various Reynolds Numbers - MSC 040A Delta Wing Orbiter, DMS-DR-1215, July 1972.

DATAMAN Publications

Mennell, R.; and Spencer, B.: Results of Transonic Tests in the NASA/LaRC 8-Foot Pressure Tunnel on a 0.015-Scale Model NR-PRR Space Shuttle Orbiter. DMS-DR-2002, (NASA CR-128752), March 1973.

Stone, D.: Static Aerodynamic Characteristics and Oil Flow and Electron Beam Results of a 0.005-Scale Model Langley Concept Space Shuttle Orbiter (LO-100) at a Mach Number of 20.3. DMS-DR-2023, (NASA CR-128763), June 1973.

Bernot, Peter T.: Hypersonic Performance, Stability and Control Characteristics of a 0.010-Scale Model of a Langley Concept Space Shuttle Orbiter. DMS-DR-2031, (NASA CR-128769), June 1973.

Johnson, C. B.; and Hale, W. M.: Heat Transfer Data to Cavities Between Simulated RSI Tiles at Mach 8. DMS-DR-2043, (NASA CR-128770), June 1973.

Stone, D. R.; and Spencer, B.: Supersonic Stability and Control Characteristics of a Langley Concept Space Shuttle Orbiter at Mach 1.5 to 4.63. DMS-DR-2033, (NASA CR-128772), July 1973.

Woods, W. C.; Stone, David R.; and Arrington, James: Aerodynamic and Flow Visualization Studies on a Space Shuttle Concept With a Double Delta Wing Orbiter at a Mach Number of 20.3. DMS-DR-2034, (NASA CR-128764), July 1973.

Stone, David R.: Aerodynamic and Low-Visualization Studies Associated With Variations in the Geometry of the Forward Portion of Irregular Planform Wings at a Mach Number of 20.3. DMS-DR-2036, (NASA CR-128775), August 1973.

Ware, G. M.; and Spencer, B.: Surface Roughness Effects on the Transonic Aerodynamics of the Rockwell International 089B-139 Orbiter. DMS-DR-2040, (NASA CR-128773), August 1973.

Spencer, Bernard: Aerodynamic Stability and Control Characteristics of a Langley Concept Space Shuttle Orbiter (LO-100) at Mach Numbers of 0.35 to 1.2. DMS-DR-2048, (NASA CR-128776), August 1973.

DATAMAN Publications - Continued

Spencer, B. and Stone, D.: Transonic Aerodynamic Characteristics Associated With Variations in the Geometry of the Forward Portion of Irregular Planform Wings. DMS-DR-2041, (NASA CR-128781), October 1973.

Dods, J. B. Jr.; Brownson, J. J.; Kassner, D. L.; and Blackwell, K. L.: Effect of Gaseous and Solid Simulated Jet Plumes on a 040A Space Shuttle Launch Configuration at Mach Numbers From .6 to 2.2. DMS-DR-2070, (NASA CR-129787), October 1973.

Ware, G. M.; and Spencer, B.: Surface Roughness Effects on the Supersonic Aerodynamics of the Rockwell International 089B-139 Orbiter. DMS-DR-2054, (NASA CR-128796), November 1973.

Ware, G. M.; Spencer, Bernard; and Milam, M. D.: Surface Roughness Effects on the Subsonic Aerodynamics of the Rockwell International 089B-139 Orbiter. DMS-DR-2056, (NASA CR-128782), November 1973.

Stone, . R.; and Spencer, B.: Supersonic Aerodynamic Characteristics Associated With Variations in the Geometry of the Forward Portion of Irregular Planform Wings. DMS-DR-2052, (NASA CR-128791), November 1973.

Powell, R. W.; and Blackstock, T. A.: Hypersonic Performance, Stability and Control Characteristics of a .0075-Scale Model Rockwell International 089B-139 Orbiter Configuration. DMS-DR-2066, (NASA CR-128783), November 1973.

Dunavant, J. C.: Effect of Wall to Total Temperature Ratio Variation on Heat Transfer. DMS-DR-2047, (NASA CR-134086), February 1974.

Ware, G. M.; and Powell, R. W.: Supersonic Performance, Stability and Control Characteristics of a 0.01875-Scale Model Rockwell International 089B-139B Orbiter Configuration. DMS-DR-2090, (NASA CR-134080), March 1974.

Ashby, G. C., Jr.: Effects of Surface Roughness on the Aerodynamic Characteristics of the Modified 089B Shuttle Orbiter at Mach 6 (LA15). DMS-DR-2079, (NASA CR-134083), April 1974.

DATAMAN Publications - Continued

Throckmorton, David A.: Heat Transfer to Surface and Gaps of RSI Tile Arrays in Turbulent Flow at Mach 10.3. DMS-DR-2169, (NASA TM X-71945), May 1974.

Bernot, Peter T.: Reynolds Number Effects at Mach Number 10.3 on Aerodynamic Characteristics of .01-Scale 139B Orbiter. DMS-DR-2127, (TM X-71954), July 1974.

Freeman, D. C.; Boyden, R. F.; and Davenport, E. E.: Supersonic Dynamic Stability Derivatives of a Modified 089B Shuttle Orbiter. DMS-DR-2106, (NASA TM X-72630), January 1975.

Freeman, D. C.: Subsonic and Transonic Dynamic Stability Derivatives of a Modified 089B Shuttle Orbiter. DMS-DR-2107, (NASA TM X-72631), March 1975.

Spencer, B.: Subsonic and Transonic Aerodynamic Characteristics Associated With Variations in the Geometry of the Foward Portion of Irregular Planform Wings on a .01875-Scale L0-100 Langley Concept Space Shuttle Orbiter in the Langley 8-Foot TPT (La7B), DMS-DR-2019, (NASA CR-141512), March 1975.

Freeman, Delma: Results of Dynamic Stability Tests Conducted on a .012-Scale Modified 089B Shuttle Orbiter in the AEDC-VKF Tunnel B at a Mach Number of 8.0 (LA42). DMS-DR-2132, (NASA CR-141535), May 1975.

Bernot, P. T.; and Vaughn, J. E.: Space Shuttle Orbiter Trimmed Center-of-Gravity Extension Study: Volume I--Effects of Configurations on the Aerodynamic Characteristics of the 140 A/B Orbiter at Mach 10. DMS-DR-2191, (TM X-72661), July 1975.

Gamble, J. D.; Spencer, B.; and Ware, G. M.: Low Supersonic Stability and Control Characteristics of a 0.015-Scale Remotely Controlled Elevon Model (49-0) of the Space Shuttle Orbiter (LA63A). DMS-DR-2270, (NASA CR-144579), December 1975.

Gamble, J.; Buhl, M.; Spencer, B.; and Ware, G.: Transonic Stability and Control Characteristics of a 0.015-Scale (Remotely Controlled Elevon) Model 49-0 of the Space Shuttle Orbiter Tested in the NASA/LaRC 8-Foot TPT (LA72). DMS-DR-2264, (NASA CR-141843), December 1975.

DATAMAN Publications - Continued

Gamble, J. D.; Spencer, B.; and Ware, G. M.: Low Supersonic Stability and Control Characteristics of a 0.015-Scale Remotely Controlled Elevon Model (49.0) of the Space Shuttle Orbiter (LA63A), DMS-DR-2270, (NASA CR-144579), December 1975.

Gamble, J.; Buhl, M.; Spencer, B.; Ware, G.; and Parrell, H.: Transonic Stability and Control Characteistics of a 0.015-Scale (Remotely Controlled Elevon) Model 49-0 of the Space Shuttle Orbiter Tested in the NASA/LaRC 8-Foot TPT (LA62). DMS-DR-2264, (NASA CR-141843), December 1975.

Spencer, B.; Stallings, R. L.; and Pope, T. C.: Heat Flux-Gage Measurements on a Flat Plate at a Mach Number of 4.6 in the VSD High Speed Wind Tunnel--A Feasibility Test. DMS-DR-2280. (NASA CR-144582), January 1976.

Spencer, B.; Stallings, R. L.; and Pope, T. C.: Upper Wind Surface Boundary Layer Measurements and Static Aerodynamic Data Obtained on a 0.015-Scale Model of the SSV Orbiter Configuration 140A/B in the LTV ASWT at a Mach Number of 4.6 (LA58). DMS-DR-2215, (NASA CR-144592), February 1976.

Ware, G.; Spencer, B.; and Pope, T. C.: Transonic-Supersonic High Reynolds Number Stability and Control Characteristics of a 0.015-Scale (Remotely Controlled Elevon) Model 44-0 of the Space Shuttle Orbiter Tested in the VSD High Speed Wind Tunnel. DMS-DR-2266, (NASA CR-144607), July 1976.

Ware, George; and Spencer, Bernard: Low Subsonic Aerodynamic Characteristics of Five Irregular Planform Wings With Systematically Varying Wing Fillet Geometry Tested in the NASA/Ames 12-Foot Pressure Tunnel (LA65). DMS-DR-2246, (NASA CR-144600), July 1976.

Throckmorton, D. A.: Effect of a Surface-to-Gap Temperature Discontinuity on the Heat Transfer to Reusable Surface Insulation Tile Gaps. DMS-DR-2328, August 1976.

Ellison, James C.: Results From Investigations in the Three NASA/LaRC Hypersonic Wind Tunnels on a 0.004-Scale Model Space Shuttle Orbiter (Model 13P-0) to Determine Real Gas Effects (LA78, LA87, LA88). DMS-DR-2311, (NASA CR-147620), August 1976.

DATAMAN Publications - Continued

Spencer, Bernard; and Ware, George M.: Shuttle Model Tailcone Pressure Distribution at Low Subsonic Speeds of a 0.03614-Scale Model in the NASA/LaRC Low Turbulence Pressure Tunnel (LA81). DMS-DR-2296, Vol. 1, (NASA CR-147609), August 1976.

Spencer, Bernard; and Ware, George M.: Shuttle Model Tailcone Pressure Distribution at Low Subsonic Speeds of a 0.03614-Scale Model in the NASA/LaRC Low Turbulence Pressure Tunnel (LA81). DMS-DR-2296, Vol. 2, (NASA CR-147610), August 1976.

Parrell, H.; Gamble, J. J.; and Spencer, B.: Transonic High Reynolds Number Stability and Control Characteristics of a 0.015-Scale Remotely Controlled Elevon Model (44-0) of the Space Shuttle Orbiter Tested in the CALSPAN 8-Foot TWT. DMS-DR-2269, NASA CR-147624), September 1976.

Underwood, J. M.; Parrell, H.; Spencer, B.; and Ware, G. M.: Subsonic Stability and Control Characteristics of a 0.015-Scale (Remotely Controlled Elevon) Model 44-0 of the Space Shuttle Orbiter Tested in the NASA/ARC 12-Foot Pressure Tunnel (LA66). DMS-DR-2281, (NASA CR-147621), September 1976.

Spencer, B.; and Ware, G. M.: Low-Subsonic Stability and Control Characteristics of a 0.015-Scale Remotely Controlled Elevon Model (44-0) of the Space Shuttle Orbiter in the Langley Research Center Low Turbulence Pressure Tunnel. DMS-DR-2300, (NASA CR-147629), October 1976.

Boyden, R. P.; Freeman, D. C.; and Davenport, E. E.: Supersonic Dynamic Stability Derivatives of the Space Shuttle Launch Vehicle. DMS-DR-2199, (NASA TM X-3315), October 1976.

Freeman, D. C.; Boyden, R. P.; and Davenport, G. E.: Subsonic and Transonic Dynamic Stability Characteristics of the Space Shuttle Launch Vehicle. DMS-DR-2200, (NASA TM X-3336), October 1976.

Ware, George and Spencer, Bernard: High Supersonic Aerodynamic Characteristics of Five Irregular Planform Wings With Systematically Varying Wing Fillet Geometry Tested in the NASA/LaRC 4-Foot UPWT (Leg 2), (LA45A/B). DMS-DR-2297, (NASA CR-147628), November 1976.

DATAMAN Publications - Continued

Spencer, B.; Ware, G.; Fournier, R.; and Gamble, J.: High Supersonic Stability and Control Characteristics of a 0.015-Scale (Remotely Controlled Elevon) Model 49-0 of the Space Shuttle Orbiter Tested in the NASA/LaRC 4-Foot UPWT (Leg 2). DMS-DR-2279, (NASA CR-144606), June 1976.

Phillips, W. P.: Transonic Stability and Control Characteristics of a 0.015-Scale Model 69-0 of the Space Shuttle Orbiter With Forebody RSI Modification in the NASA/LaRC 8-Foot TPT (LA72). DMS-DR-2309, (NASA CR-147644), November 1976.

Spencer, B.; and Ware, G. M.: High Supersonic Stability and Control Characteristics of a 0.015-Scale (Remotely Controlled Elevon) Model 44-0 Space Shuttle Orbiter Tested in the NASA/LaRC 4-Foot UPWT (Leg 2) (LA75). DMS-DR-2318, Vol. 1, (NASA CR-147646), December 1976.

Spencer, B.; and Ware, G. M.: High Supersonic Stability and Control Characteristics of a 0.015-Scale (Remotely Controlled Elevon) Model 44-0 Space Shuttle Orbiter Tested in the NASA/LaRC 4-Foot UPWT (Leg 2) (LA75), DMS-DR-2318, Vol. 2, (NASA CR-147647), December 1976.

Phillips, W. P.: Space Shuttle Orbiter Trimmed Center-of-Gravity Extension Study. Volume II--Effects of Configuration Modifications on the Aerodynamic Characteristics of the 140A/B Orbiter at Transonic Speeds. DMS-DR-2182, (NASA TM X-72661), February 1977.

Phillips, W. P.: Supersonic Stability and Control Characteristics of a 0.015-Scale Model 69-0 of the Space Shuttle Orbiter With Forebody RSI Modifications in the NASA/LaRC 4-Foot UPWT (Legs 1 and 2). DMS-DR-2271, (NASA CR-151044), February 1977.

Spencer, Bernard; and Ware, George M.: Transonic Control Effectiveness for Full and Partial Span Elevon Configurations on a 0.0165-Scale Model Space Shuttle Orbiter Tested in the LaRC 8-Foot Transonic Pressure Tunnel. DMS-DR-2184, (NASA CR-151061), April 1977.

DATAMAN Publications - Continued

Spencer, Bernard; and Ware, George M.: Supersonic Control Effectiveness for Full and Partial Span Elevon Configurations on a 0.0165-Scale Model Space Shuttle Orbiter Tested in the LaRC Unitary Plan Wind Tunnel. DMS-DR-2182, (NASA CR-151062), April 1977.

Spencer, B.; and Ware, G. M.: Results of a Drag Reduction Investigation on a 0.010-Scale Model of the Space Shuttle Vehicle 72-OTS Launch Configuration Tested in the LaRC 8-Foot Transonic Pressure Tunnel for the Mach Range of 0.3 to 1.20. DMS-DR-2233, (NASA CR-151068), June 1977.

Spencer, Bernard; and Ware, George M.: High Reynolds Number Transonic Stability and Control Characteristics of a 0.015-Scale (Remotely Controlled Elevon) Model 44-0 of the Space Shuttle Orbiter Tested in the VSD High Speed Tunnel (LA76). DMS-DR-2305, Vol. 1, (NASA CR-151059), June 1977.

Spencer, Bernard; and Ware, George M.: High Reynolds Number Transonic Stability Control Characteristics of a 0.015-Scale (Remotely Controlled Elevon) Model 44-0 of the Space Shuttle Orbiter Tested in the VSD High Speed Tunnel (LA76). DMS-DR-2305, Vol. 2, (NASA CR-151060), June 1977.

Freeman, D. C.; and Boyden, R. P.: Dynamic Stability Characteristics of the Combination Space Shuttle Orbiter and Ferry Combination. DMS-DR-2299, (NASA TM X-3497), June 1977.

Spencer, B.; and Ware, G. M.: Results of a Drag Reduction Investigation on an 0.010-Scale Model of the Space Shuttle Vehicle (72-OTS) Launch Configuration Tested in the LaRC 8-Foot Transonic Pressure Tunnel for the Mach Range of 0.35 to 1.20. DMS-DR-2257, (NASA CR-151369), September 1977.

Ware, G.; and Spencer, B.: Effect of SILTS Pod on the High Supersonic Aerodynamic Characteristics of a 0.015-Scale Shuttle Orbiter Model (44-0) Tested in the NASA/LaRC 4-Foot UPWT (Leg 2). DMS-DR-2399, (NASA CR-151388), November 1977.

Ware, G.; and Spencer, B.: Effect of SILTS Pod on the Low Supersonic Aerodynamic Characteristics of a 0.015-Scale Shuttle Orbiter Model (44-0) Tested in the NASA/LaRC 4-Foot UPWT (Leg 1). DMS-DR-2396, December 1977.

DATAMAN Publications - Continued

Spencer, Bernard; and Ware, George M.: A Study of Transonic Beta Hysteresis of an 0.015-Scale Model 44.0 Space Shuttle Orbiter Tested in the NASA/LaRC 8-Foot Transonic Pressure Tunnel. DMS-DR-2352. (NASA CR-151383), January 1978.

Ware, George M.; and Spencer, Bernard: Effect of SILTS Pod on the Transonic Aerodynamic Characteristics of a 0.015-Scale Shuttle Orbiter Model (44-0) Tested in the NASA/LaRC 8-Foot TPT. DMS-DR-2395, January 1978.

Spencer, Bernard; and Ware, George M.: Results of a Drag Reduction Investigated on an 0.010-Scale Model of the Space Shuttle Vehicle 72-OTS Launch Configuration Tested in the LaRC 8-Foot Transonic Pressure Tunnel for the Mach Range of 0.35 to 1.20 (LA56). DMS-DR-2224, (NASA CR-147650), March 1978.

Scallion, W. I.: Space Shuttle Orbiter Trimmed Center-of-Gravity Extension Study. Volume IV--Effects of Configuration Modifications on the Aerodynamics of the 139B Orbiter at Mach 20.3. DMS-DR-2176, (NASA TM X-72661), May 1978.

Spencer, Bernard: Low Speed Stability and Control Characteristics of a 0.015-Scale Model 69-0 of the Space Shuttle Orbiter With Forebody RSI Modifications in the NASA/LaRC Low Turbulence Pressure Tunnel (LA73A/B). DMS-DR-2298, (NASA CR-151409), May 1978.

Carlson, H. W.; and Mach, R. J.: A Wind Tunnel Study of the Applicability of Far-Field Sonic-Boom Theory to the Space Shuttle Orbiter. DMS-DR-2426, (NASA TP-1186), June 1978.

MacConochie, I. O.: Space Shuttle Orbiter Trimmed Center-of-Gravity Extension Study. Volume VI--System Design Studies. DMS-DR-2436, (NASA TM X-72661), August 1978.

Dunavant, J. C.: Impact of Retrofits for Center-of-Gravity Extension on Orbiter Thermal PRotection System. DMS-DR-2454, Vol. 3, (NASA TM X-72661), April 1979.

DATAMAN Publications - Continued

Gamble, J.; Underwood, J.; Spencer, B.; and Ware, G.: Transonic Stability and Control Characteristics of a 0.015-Scale (Remotely Controlled Elevon) Model 44-0 of the Space Shuttle Orbiter Tested in the NASA/ARC 11-Foot Transonic Wind Tunnel (LA77). DMS-DR-2344, Vol. 1, (NASA CR-151788), January 1980.

Gamble, J.; Underwood, J.; Parrell, H.; Spencer, B.; and Ware, G.: Transonic Stability and Control Characteristics of a 0.015-Scale (Remotely Controlled Elevon) Model 44-0 of the Space Shuttle Orbiter Tested in the NASA/ARC 11-Foot Transonic Wind Tunnel (LA77). DMS-DR-2344, Vol. 2, (NASA CR-151789), January 1980.

Spencer, Bernard; and Ware, George M.: Low Supersonic Stability and Control Characteristics of a 0.0015-Scale (Remotely Controlled Elevon) Model 44-0 Space Shuttle Orbiter Tested in the NASA/LaRC 4-Foot UPWT (Leg 1) (LA101). DMS-DR-2390, (NASA CR-160481), June 1980.

Scallion, W. I.: Pressure Distribution and Integrated Loads at Four Stations on the Space Shuttle Tank Lox Feedline (LA140). DMS-DR-2475, (NASA CR-160509), August 1980.

Spencer, Bernard: and Ware, George M.: High Supersonic Rudder Effectiveness and Effect of SILTS Pod on a 0.20-Scale (Remotely Driven Control Surface) Model 106-0 Space Shuttle Orbiter Tested in the NASA/LaRC 4-Foot Unitary Plan Wind Tunnel (LA131). DMS-DR-2478, Vol. 1, (NASA CR-160503), August 1980.

Spencer, Bernard; and Ware, George M.: High Supersonic Rudder Effectiveness and Effect of SILTS Pod on a 0.20-Scale (Remotely Driven Control Surface) Model 106-0 Space Shuttle Orbiter Tested in the NASA/LaRC 4-Foot Unitary Plan Wind Tunnel (LA131). DMS-DR-2478, Vol. 2, (NASA CR-160504), August 1980.

Spencer, Bernard; and Ware, George M.: High Supersonic Rudder Effectiveness and Effect of SILTS Pod on a 0.20-Scale (Remotely Driven Control Surface) Model 106-0 Space Shuttle Orbiter Tested in the NASA/LaRC 4-Foot Unitary Plan Wind Tunnel (LA131). DMS-DR-2478, Vol. 3, (NASA CR-160505), August 1980.

DATAMAN Publications - Continued

Spencer, Bernard; and Ware, George M.: Effect of Tailcone Cut-Off and Sting Configuration on the Aerodynamic Characteristics of a 0.030-Scale (Remotely Controlled Elevon Bodyflap and Rudder) Model 201-0 ALT Orbiter Tested in the NASA/LaRC 8-Foot TPT (LA99). DMS-DR-2373, (NASA CR-160821), 1980.

Calloway, R. L.: Results of Investigations of an 0.004-Scale 140C Modified Configuration Space Shuttle Vehicle Orbiter Model (74-0) in the NASA Langley Research Center 20-Inch Mach 6 Tunnel (LA141). DMS-DR-2477, 1980.

Scallion, W. I.: Results of Tests on a 0.02-Scale Space Shuttle Launch Vehicle Model (890TS) in the LaRC 16-Foot Transonic Wind Tunnel to Determine Pressure Distribution Along the External Tank Lox Cable Tray (LA132). DMS-DR-2471, (NASA CR-160514), 1980.