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# NASA Langley Scientific and Technical Information Output—1998

*Harriet B. Machie and Susan H. Stewart, Compilers  
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February 1999

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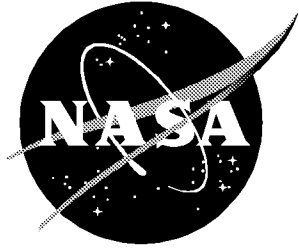
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National Aeronautics and  
Space Administration

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## **Preface**

This report contains a listing of the NASA Langley Research Center's publicly available scientific and technical research output for C.Y. 1998.

The intent of this report is to provide a greater awareness of the broad scope of results and the importance of the research and development work conducted by scientists and engineers at Langley. This current awareness is mandated by the National Aeronautics and Space Act of 1958, which provides for the widest practical dissemination of NASA research.

During C.Y. 1998, Langley's contributions to NASA and non-NASA literature included 29 Technical Publications, 13 Conference Publications, 64 Technical Memorandums, 137 Contractor Reports, 166 Journal Articles and Book Publications, 479 Meeting Presentations, 50 Technical Talks, and 32 Patents.

## Introduction

The NASA Langley Research Center is one of the Nation's leading laboratories for research and development in the sciences of aeronautics and space technology. Langley conducts basic and applied research in the areas of Airframe Systems, Aerodynamics, Atmospheric Science, and Structures and Materials.

This document contains a bibliography of Langley's publicly available scientific and technical research output for 1998 which is processed through the Center's Information Systems and Services Division, an integral part of NASA's Agency-wide Scientific and Technical Information (STI) system. The results of Langley's research are disseminated in a variety of NASA and non-NASA scientific and technical media and information systems. This document is intended to be a reference summary for researchers and a current awareness publication for the scientific, research, and academic community. Details of the availability of the research references in this document are found in the section, "Availability," on page vii.

Many Langley reports are available electronically on the Langley Technical Report Server (LTRS) at <http://techreports.larc.nasa.gov/ltrs/ltrs.html> or the Institute for Computer Applications in Science and Engineering (ICASE) Technical Report Server (ITRS) at <http://www.icase.edu/docs/library/itrs.html> via the World Wide Web (WWW). The relative Uniform Resource Locators are noted below citations for reports available electronically.

The citations are grouped by the Scientific and Technical Aerospace Reports (STAR) subject categories and listed alphabetically by author or innovator. The Langley organization to which the senior author or innovator is assigned and the Research and Technology Objectives and Plans (RTOP) number are noted below citations when appropriate and included in the indexes.

Patents listed are those which were issued in 1998 and owned by Langley Research Center.

Publication of some journal articles was not known at press time for the 1997 issue of this document. These articles are therefore listed in the 1998 issue.

## Availability

<u>Category</u>	<u>Source</u>
NASA Reports	NASA Center for AeroSpace Information (CASI) 7121 Standard Drive Hanover, MD 21076-1320 (301) 621-0390  National Technical Information Service (NTIS) 5285 Port Royal Road Springfield, VA 22161-2171 (703) 605-6000
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- 1** Babcock, P.; Schor, A.; and Rosch, G.: Reliability Modeling Methodology for Independent Approaches on Parallel Runways Safety Analysis. (NAS2-14361 Logistics Management Institute.) NASA CR-1998-207660, April 1998, 48 p.  
<http://techreports.larc.nasa.gov/ltrs/PDF/1998/cr/NASA-98-cr207660.pdf>  
Organization K RTOP 538-08-11
- 2** Etheridge, M.; Plugge, J.; and Retina, N.: Aircraft/Air Traffic Management Functional Analysis Model, Version 2.0, Technical Description. (NAS2-14361 Logistics Management Institute.) NASA CR-1998-207657, April 1998, 70 p.  
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- 3** Etheridge, M.; Plugge, J.; and Retina, N.: Aircraft/Air Traffic Management Functional Analysis Model, Version 2.0, User's Guide. (NAS2-14361 Logistics Management Institute.) NASA CR-1998-207658, April 1998, 44 p.  
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- 4** Hemm, R. V.; and Shapiro, G.: Terminal Area Productivity Airport Wind Analysis and Chicago O'Hare Model Description. (NAS2-14361 Logistics Management Institute.) NASA CR-1998-207662, April 1998, 31 p.  
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- 5** Johnson, J. P.; and Gaier, E. M.: Air Cargo Operations Cost Database. (NAS2-14361 Logistics Management Institute.) NASA CR-1998-207655, April 1998, 130 p.  
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- 6** Kaplan, B. J.; and Lee, D. A.: Key Metrics and Goals for NASA's Advanced Air Transportation Technologies Program. (NAS2-14361 Logistics Management Institute.) NASA CR-1998-207678, May 1998, 43 p.  
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- 7 Kostiuk, P. F.; Adams, M. B.; Allinger, D. F.; Rosch, G.; and Kuchar, J. K.: An Integrated Safety Analysis Methodology for Emerging Air Transport Technologies. (NAS2-14361 Logistics Management Institute.) NASA CR-1998-207661, April 1998, 64 p.  
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- 8 Kostiuk, P. F.; Shapiro, G.; Hanson, D.; Kolitz, S.; Leong, F.; Rosch, G.; and Bonesteel, C.: A Method for Evaluating the Safety Impacts of Air Traffic Automation. (NAS2-14361 Logistics Management Institute.) NASA CR-1998-207673, May 1998, 74 p.  
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- 9 Lee, D. A.; Long, D.; Etheridge, M.; Plugge, J.; Johnson, J. P.; and Kostiuk, P. F.: A Method for Making Cross-Comparable Estimates of the Benefits of Decision Support Technologies for Air Traffic Management. (NAS2-14361 Logistics Management Institute.) NASA CR-1998-208455, July 1998, 92 p.  
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- 11 Roberts, E.; Villani, J. A.; Osman, M.; Godso, D.; King, B.; and Ricciardi, M.: Aviation System Analysis Capability Executive Assistant Design. (NAS2-14361 Logistics Management Institute.) NASA CR-1998-207679, May 1998, 211 p.  
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- 14 Smith, A.; and Poll, D. I.: Instability and Transition of Flow at, and Near, an Attachment-Line—Including Control by Surface Suction. (NCC1-218 Cranfield University.) NASA CR-1998-208443, July 1998, 51 p.  
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- 15** Wingrove, E. R., III; Ege, R.; Burn, M.; Carey, J. A.; and Bradley, K. A.: The Aviation System Analysis Capability Noise Impact Model. (NAS2-14361 Logistics Management Institute.) NASA CR-1998-208952, November 1998, 76 p.  
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- 16** Wingrove, E. R., III; Gaier, E. M.; and Santmire, T. E.: The ASAC Air Carrier Investment Model (Third Generation). (NAS2-14361 Logistics Management Institute.) NASA CR-1998-207656, April 1998, 64 p.  
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- 17** Wlezien, R. W.; Horner, G. C.; McGowan, A. R.; Padula, S. L.; Scott, M. A.; Silcox, R. J.; and Simpson, J. O.: The Aircraft Morphing Program. Presented at SPIE's 5th Annual International Symposium on Smart Structures and Materials, March 1-5, 1998, San Diego, California.  
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- 18** Wlezien, R. W.; Horner, G. C.; McGowan, A. R.; Padula, S. L.; Scott, M. A.; Silcox, R. J.; and Simpson, J. O.: The Aircraft Morphing Program. Presented at 39th AIAA/ASME/ASCE/AHS/ASC Structures, Structural Dynamics, and Materials Conference, April 20-23, 1998, Long Beach, California. AIAA Paper No. 98-1927.  
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- 19** Yaros, S. F.; Sexstone, M. G.; Huebner, L. D.; Lamar, J. E.; McKinley, R. E., Jr.; Torres, A. O.; Burley, C. L.; Scott, R. C.; and Small, W. J.: Synergistic Airframe-Propulsion Interactions and Integrations—A White Paper Prepared by the 1996-1997 Langley Aeronautics Technical Committee. NASA TM-1998-207644, March 1998, 126 p.  
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- 20** Alexandrov, N. M.; Dennis, J. E., Jr.; Lewis, R. M.; and Torczon, V.: A Trust Region Framework for Managing the Use of Approximation Models in Optimization. *Structural Optimization*, Volume 15, No. 1, February 1998, p. 16-23.  
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- 21** Allen, J. M.; Martin, G.; and Kubiatico, P.: Supersonic Aftbody Closure Test (UPWT 1707). Presented at Third HSR Configuration Aero Testing Workshop, September 18-20, 1998, Moffett Field, California.  
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- 22** Anders, J. B., Jr.; Anderson, W. K.; and Murthy, A. V.: The Use of Heavy Gas for Increased Reynolds Numbers in Transonic Wind Tunnels. Presented at 20th AIAA Advanced Measurement and Ground Testing Technology Conference, June 15-18, 1998, Albuquerque, New Mexico. AIAA Paper No. 98-2882.  
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- 23** Asbury, S. C.; and Yetter, J. A.: Static Performance of a Wing-Mounted Thrust Reverser Concept. Presented at 34th AIAA/ASME/SAE/ASEE Joint Propulsion Conference and Exhibit, July 13-15, 1998, Cleveland, Ohio. AIAA Paper No. 98-3256.  
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- 24** Bartels, R. E.: Flow and Turbulence Modeling and Computation of Shock Buffet Onset for Conventional and Supercritical Airfoils. NASA TP-1998-206908, February 1998, 41 p.  
<http://techreports.larc.nasa.gov/ltrs/PDF/1998/tp/NASA-98-tp206908.pdf>  
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- 25** Bauer, S. X.: An Aerodynamic Assessment of Micro-Drag Generators (MDGs). Presented at 16th AIAA Applied Aerodynamics Meeting, June 15-18, 1998, Albuquerque, New Mexico. AIAA Paper No. 98-2621.  
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- 26** Blanchard, R. C.: Review of Entry Flight Aerodynamic Measurements During Rarefied-Flow Transition. Presented at 21st International Symposium on Rarefied Gas Dynamics, July 26-31, 1998, Marseille, France.  
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- 27** Blanchard, R. C.; Wilmoth, R. G.; and Moss, J. N.: Mars Entry Vehicle Aerodynamic Flight Measurements. Presented at 21st Congress of the International Council of the Aeronautical Sciences (ICAS), September 13-18, 1998, Melbourne, Australia.  
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- 28** Bonhaus, D. L.; and Maddalon, D. V.: Assessment of an Euler-Interacting Boundary Layer Method Using High Reynolds Number Transonic Transport Flight Data. NASA TP-1998-208461, August 1998, 43 p.  
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- 29** Brauckmann, G. J.: X-34 Vehicle Aerodynamic Characteristics. Presented at 16th AIAA Applied Aerodynamics Meeting, June 15-18, 1998, Albuquerque, New Mexico. In Proceedings, AIAA Paper No. 98-2531.  
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- 30** Buck, G. M.: Simultaneous Luminescence Pressure and Temperature Mapping. U. S. Patent 5,818,057. Issued October 6, 1998.  
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- 31** Campbell, R. L.: Efficient Viscous Design of Realistic Aircraft Configurations. Presented at 29th AIAA Fluid Dynamics Conference, June 15-18, 1998, Albuquerque, New Mexico. AIAA Paper No. 98-2539.  
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- 32** Carle, A.; Fagan, M.; and Green, L. L.: Preliminary Results From the Application of Automatic Adjoint Code Generation to CFL3D. Presented at 7th AIAA/USAF/NASA/ISSMO Symposium on Multidisciplinary Analysis and Optimization, September 2-4, 1998, St. Louis, Missouri. AIAA Paper No. 98-4807.  
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- 33** Carlson, J. R.: Prediction of Very High Reynolds Number Compressible Skin Friction. Presented at 20th AIAA Advanced Measurement and Ground Testing Technology Conference, June 15-18, 1998, Albuquerque, New Mexico. AIAA Paper No. 98-2880.  
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- 35** Charlton, E. F.: Numerical Stability and Control Analysis Towards Falling Leaf Prediction Capabilities of Splitflow for Two Generic High-Performance Aircraft Models. (NAS1-96014 Lockheed Martin Engineering & Sciences.) NASA CR-1998-208730, September 1998, 59 p.  
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- 36** Darden, C. M.: An Overview of NASA's High-Speed Research Program: Environmental Issues and Economic Concerns. Presented at 1998 European Community on Computational Methods in Applied Sciences, September 7-11, 1998, Athens, Greece.  
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- 37** Deere, K. A.: PAB3D Simulations of a Nozzle With Fluidic Injection for Yaw Thrust-Vector Control. Presented at 34th AIAA/ASME/SAE/ASEE Joint Propulsion Conference and Exhibit, July 13-15, 1998, Cleveland, Ohio. AIAA Paper No. 98-3254.  
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- 38** Fisher, D. F.; Cobleigh, B. R.; Banks, D. W.; Hall, R. M.; and Wahls, R. A.: Reynolds Number Effects at High Angles of Attack. Presented at 20th AIAA Advanced Measurement and Ground Testing Technology Conference, June 15-18, 1998, Albuquerque, New Mexico. AIAA Paper No. 98-2879, also available as NASA/TP-1998-206553.  
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- 39** Flamm, J. D.: Experimental Study of a Nozzle Using Fluidic Counterflow for Thrust Vectoring. Presented at 34th AIAA/ASME/SAE/ASEE Joint Propulsion Conference and Exhibit, July 13-15, 1998, Cleveland, Ohio. AIAA Paper No. 98-3255.  
<http://techreports.larc.nasa.gov/ltrs/PDF/1998/aiaa/NASA-aiaa-98-3255.pdf>  
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- 40** Frink, N. T.: Tetrahedral Unstructured Navier-Stokes Method for Turbulent Flows. *AIAA Journal*, Volume 36, No. 11, November 1998, p. 1975-1982.  
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- 41** Frink, N. T.; and Pirzadeh, S. Z.: Tetrahedral Finite-Volume Solutions to the Navier-Stokes Equations on Complex Configurations. NASA TM-1998-208961, December 1998, 16 p.  
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- 42** Frink, N. T.; and Pirzadeh, S. Z.: Tetrahedral Finite-Volume Solutions to the Navier-Stokes Equations on Complex Geometries. Presented at 10th International Conference on Finite Elements in Fluids, January 5-9, 1998, Tucson, Arizona.  
<ftp://techreports.larc.nasa.gov/pub/techreports/larc/1998/mtg/NASA-98-10icfef-ntf.ps.Z>  
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- 43** Hall, R. M.: Impact of Fuselage Cross Section on the Stability of a Generic Fighter. Presented at 16th AIAA Applied Aerodynamics Meeting, June 15-18, 1998, Albuquerque, New Mexico. AIAA Paper No. 98-2725.  
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- 44** Hall, R. M.; Banks, D. W.; Erickson, G. E.; Fox, C. H., Jr.; and Fisher, D. F.: Evaluation of Gritting Strategies for High Angle of Attack Using Wind Tunnel and Flight Test Data for the F/A-18. NASA TP-1998-207670, May 1998, 124 p.  
<http://techreports.larc.nasa.gov/ltrs/PDF/1998/tp/NASA-98-tp207670.pdf>  
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- 45** Huai, X.; Joslin, R. D.; and Piomelli, U.: Large-Eddy Simulation of Transition to Turbulence in Boundary Layers. *Theoretical and Computational Fluid Dynamics*, Volume 9, No. 2, 1997, p. 149-163.  
 Organization DF RTOP 522-31-11



- 46** Hunter, C. A.: Experimental, Theoretical, and Computational Investigation of Separated Nozzle Flows. Presented at 34th AIAA/ASME/SAE/ASEE Joint Propulsion Conference and Exhibit, July 13-15, 1998, Cleveland, Ohio. AIAA Paper No. 98-3107.  
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