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Scientific and Technical Information Output of the Langley Research Center for Calendar Year 1981

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NASA Technical Memorandum 83270

**Scientific and Technical Information
Output of the Langley Research Center
for Calendar Year 1981**

Compiled by
Report and Manuscript Control Office,
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Langley Research Center
Hampton, Virginia

NASA

National Aeronautics and
Space Administration

Langley Research Center
Hampton, Virginia 23665



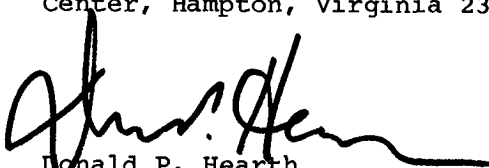
FOREWORD

This report contains a listing of Langley Research Center's scientific and technical research output for calendar year 1981.

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. This publication provides researchers and the scientific, industrial, and educational community with a comprehensive state-of-the-art reference document by compiling under one cover all citations and availability of Langley's report and periodical literature, conference papers, national and international meeting papers, computer programs, patents, and other related research published during 1981.

During the calendar year 1981, Langley's contributions to NASA and non-NASA literature included 177 NASA Formal Reports, 127 Quick-Release Technical Memorandums, 242 NASA Contractor Reports, 181 Journal Articles, 349 Meeting/Conference Papers, 20 NASA Computer Programs, 65 "NASA Tech Briefs," 24 Patents, and 221 Oral Presentations to Conferences/Workshops.

Comments or suggestions concerning this publication should be addressed to the Research Information and Applications Division, Mail Stop 180A, NASA Langley Research Center, Hampton, Virginia 23665.



Donald P. Hearsh
Director

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 fluid and flight mechanics, flight systems, structures and materials, acoustics and noise reduction, measurements and instrumentation systems, numerical methods and techniques, data systems, electronics, physics, chemistry, and Earth and space sciences.

This publication is a compilation of Langley's scientific and technical research output for 1981 which is processed through the Center's Research Information and Applications Division, an integral part of NASA's Agency-wide Scientific and Technical Information (STI) system. This volume is intended as a reference summary for researchers and as a current awareness publication for the scientific, research, and academic community.

The results of Langley's research are disseminated in a variety of NASA and non-NASA scientific and technical media and information system. Details concerning the availability of the research which is referenced in this document are found in the AVAILABILITY section on page vii.

Citations include NASA Formal Reports (Technical Papers, Technical Memorandums, Conference Publications, and Reference Publications), Quick-Release Technical Memorandums, Contractor Reports, Journal Articles/Periodical Literature, Meeting/Conference Papers, Computer Programs, "NASA Tech Briefs" (a quarterly publication for United States industry and technology transfer agents), Patents, and Oral Presentations to Conferences/Workshops. There is a separate section for citations for NASA Contractor Reports funded by the Army Structures Laboratory (AVRADCOM).

The citations are listed first by Langley Directorates, then by the Langley Office or Division. Citations are listed alphabetically by author under each heading. If a citation has more than one author, it is listed only once under the senior author's name. "NASA Tech Briefs" are listed under the main innovator's name although this is not necessarily the order in which the innovators' names appear on the "NASA Tech Briefs." The subject category used to index the citation, the source of availability, and the Research Technology Objectives and Plans (RTOP, the funding program) numbers are noted at the end of each citation.

Computer programs which are cited in this document have been announced in 1981 issues of "Computer Program Abstracts," an indexing and abstracting journal of selected computer programs developed by NASA, NASA contractors, and other federal agencies.

The "NASA Tech Briefs" articles which are cited have been published in 1981 issues of the "NASA Tech Briefs" journal. Subscriptions to this journal are available through the NASA Technology Utilization Program by writing to the Director, Technology Transfer Division, NASA Scientific and Technical Information Facility, P.O. Box 8757, Baltimore/Washington International Airport, Maryland 21240.

Patents listed which are owned in whole or in part by Langley Research Center personnel have been published in issues of "Scientific and Technical Aerospace Reports" (STAR), a NASA announcement journal for report literature. STAR is available on a subscription basis from the U.S. Government Printing Office (GPO) or to qualified recipients from the NASA Scientific and Technical Information Service (STIF).

The publication of this report required the efforts of many individuals. Special recognition is given to the Scientific and Technical Information Coordinators for ensuring the accuracy of their respective Division or Office submittals and to the Office of Patent Counsel for providing the Patent listings.

AVAILABILITY

Availability sources of the different output categories are given below:

<u>Category</u>	<u>Source</u>
NASA Report Literature:	National Technical Information Service (NTIS) 5285 Port Royal Road Springfield, VA 22161
Formal Reports	
Quick-Release Technical Memorandums	NASA Scientific and Technical Information Facility (STIF) P.O. Box 8757 Baltimore/Washington International Airport, MD 21240
Contractor Reports	
	NASA Industrial Applications Centers (IAC) (See Appendix for addresses of IAC's)
Journal Articles	
Conference/Meeting Papers	Consult citation for source of availability
Computer Programs	Computer Software Management and Information Center (COSMIC) 112 Barrow Hall University of Georgia Athens, GA 30601
Tech Briefs	Office of Technology Utilization and Applications Programs Mail stop 139A NASA Langley Research Center Hampton, VA 23665
Patents:	
Patent Application Specifications	National Technical Information Service (NTIS)
Printed Copies	Commissioner of Patents and Trademarks U.S. Patent and Trademark Office Washington, DC 20231
Oral Presentations to Conferences/ Workshops	Consult the Author

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NASA LANGLEY RESEARCH CENTER
Hampton, Virginia

CALENDAR YEAR 1981

PUBLICATIONS FOR OFFICE OF THE DIRECTOR

Formal Reports

No formal reports.

Quick-Release Technical Memorandums

1. Anon: Research and Technology - 1981 Annual Report of the Langley Research Center. NASA TM-83221, November 1981, 68 p.
(Avail: NTIS Subject Category 99)

Contractor Reports

2. Spencer, John H. (compiler): Final Report: 1981 Summer Research Fellowship Program. (NAS1-16455 Hampton Institute.) NASA CR-165814, October 1981, 35 p.
(Avail: NTIS Subject Category 80 RTOP 340-00-00)

Journal Articles and Periodical Literature

No journal articles and periodical literature.

Meeting/Conference Papers

3. Heldenfels, Richard R.: Some Historical Perspectives on Thermostructural Research at the NASA Langley Aeronautical Laboratory, 1948-1958. Presented at the Symposium on "Computational Aspects of Heat Transfer in Structures," November 3-5, 1981, Hampton, Virginia.
(Avail: NTIS, NASA CP-2216 (Pending) Subject Category 34
RTOP 506-53-53)

Computer Programs

No computer programs.

Tech Briefs

No tech briefs.

Patents

No patents.

Oral Presentations to Conferences/Workshops

4. Houbolt, John: Atmospheric Turbulence and Aircraft Design - The Evolution Over the Years. Presented at the AIAA/ASME/ASCE/AHS 22nd Structures, Structural Dynamics and Materials Conference, April 6-8, 1981, Atlanta, Georgia.

PUBLICATIONS FOR OFFICE OF DIRECTOR FOR PROJECTS

Formal Reports

5. Jones, Kenneth L.; Henshaw, Mary; McMenemy, Christie; Robles, Andres; Scribner, Paul C.; Wall, Stephen D.; and Wilson, Jackson W.: Viking Lander Imaging Investigation During Extended and Continuation Automatic Missions. Volume I - Lander 1 Picture Catalog of Experiment Data Record. NASA RP-1068, June 1981, 654 p.
(Avail: NTIS Subject Category 91 RTOP 505-34-23)
6. Jones, Kenneth L.; Henshaw, Mary; McMenemy, Christie; Robles, Andres; Scribner, Paul C.; Wall, Stephen D.; and Wilson, Jackson W.: Viking Lander Imaging Investigation During Extended and Continuation Automatic Missions. Volume II - Lander 2 Picture Catalog of Experiment Data Record. NASA RP-1068, June 1981, 565 p.
(Avail: NTIS Subject Category 91 RTOP 505-34-23)
7. Lightner, E. Burton (compiler): Structural Dynamics and Control of Large Space Structures. NASA CP-2187, July 1981, 138 p.
(Avail: NTIS Subject Category 15 RTOP 506-54-93)
8. Masursky, Harold; and Crabill, Norman L.: Viking Site Selection and Certification. NASA SP-429, June 1981, 37 p.
(Avail: NTIS Subject Category 91 RTOP 815-00-00)

Quick-Release Technical Memorandums

No quick-release technical memorandums.

Contractor Reports

9. Hays, D.: An Assessment of Alternate Thermal Protection Systems for the Space Shuttle Orbiter - Volume 2: Data Transmittal. (NAS1-16302 Rockwell International Corporation.) NASA CR-165790, 1981.
(Avail: STIF (Pending) Subject Category 16 RTOP 936-34-00)

Journal Articles and Periodical Literature

No journal articles and periodical literature.

Meeting/Conference Papers

10. Crumbly, Kenneth H.; and Harris, Jack E.: Atmospheric Lidar Multi-User Instrument - A Spacelab Payload. Presented at the SPIE's Los Angeles Technical Symposium, February 9-13, 1981, North Hollywood, California.
(Avail: SPIE Subject Category 46 RTOP 146-60-03)

Computer Programs

No computer programs.

Tech Briefs

11. Kenigsberg, Irwin; and Madden, John F. (United Technologies Corporation):
Isolation and Measurement of Rotor Vibration Forces. NASA Tech Brief
LAR-12476. Released 1981.
(Avail: NASA Langley Technology Utilization Office Category: Mechanics)

Patents

No patents.

Oral Presentations to Conferences/Workshops

12. Wright, Howard T.: Future of Aeronautics and Space. Presented at the American
Society of Military Comptrollers Meeting, December 9, 1981, Hampton, Virginia.

PUBLICATIONS FOR PROJECTS MANAGEMENT SYSTEMS DIVISION

Formal Reports

No formal reports.

Quick-Release Technical Memorandums

13. Sibbers, Charles W.: Guidelines for Cost Control and Analysis of Cost-Type Research and Development Contracts. NASA TM-83108, May 1981, 69 p.
(Avail: NTIS Subject Category 81 RTOP 992-02-00)

Contractor Reports

No contractor reports.

Journal Articles and Periodical Literature

No journal articles and periodical literature.

Meeting/Conference Papers

14. Dilts, Doug; and Moore, Frederick L.: Using PRICE to Estimate Cost of Future Large Space Structures. Presented at the 1981 International Parametrics Conference, May 4-7, 1981, San Diego, California.
(Avail: ISPA, Proceedings Subject Category 83 RTOP 506-62-43)
15. Wood, Darrell A.; and Moore, Frederick L.: Automated Program Planning Tool Utilizing CER's. Presented at the 1981 International Parametrics Conference, May 4-7, 1981, San Diego, California.
(Avail: ISPA, Proceedings Subject Category 83 RTOP 506-62-43)

Computer Programs

No computer programs.

Tech Briefs

No tech briefs.

Patents

No patents.

Oral Presentations to Conferences/Workshops

No oral presentations to conferences/workshops.

PUBLICATIONS FOR SCOUT PROJECT OFFICE

Formal Reports

No formal reports.

Quick-Release Technical Memorandums

No quick-release technical memorandums.

Contractor Reports

16. Myler, T. R.: Moments of Inclination Error Distribution Computer Program. (NAS1-15000 Vought Corporation.) NASA CR-165824, December 1981, 50 p. (Avail: IAC Subject Category 61 RTOP 490-02-02)
17. Myler, T. R.: NEMAR Plotting Computer Program. (NAS1-15000 Vought Corporation.) NASA CR-165831, December 1981, 66 p. (Avail: IAC Subject Category 61 RTOP 490-02-02)
18. Myler, T. R.: Elliptical Orbit Performance Computer Program. (NAS1-15000 Vought Corporation.) NASA CR-165832, December 1981, 55 p. (Avail: IAC Subject Category 61 RTOP 490-02-02)

Journal Articles and Periodical Literature

No journal articles and periodical literature.

Meeting/Conference Papers

19. Foster, Lee R., Jr.; and Urash, Richard G.: The Scout Launch Vehicle Program. Presented at the Eighteenth Space Congress, April 29-May 1, 1981, Kennedy Space Center, Florida. (Avail: Kennedy Space Flight Center, Proceedings Subject Category 15 RTOP 490-00-23)

Computer Programs

No computer programs.

Tech Briefs

No tech briefs.

Patents

No patents.

Oral Presentations to Conference/Workshops

No oral presentations to conference/workshops.

PUBLICATIONS FOR LONG DURATION EXPOSURE FACILITY PROJECT OFFICE

Formal Reports

No formal reports.

Quick-Release Technical Memorandums

No quick-release technical memorandums.

Contractor Reports

No contractor reports.

Journal Articles and Periodical Literature

No journal articles and periodical literature.

Meeting/Conference Papers

No meeting/conference papers.

Computer Programs

No computer programs.

Tech Briefs

No tech briefs.

Patents

No patents.

Oral Presentations to Conferences/Workshops

20. Clark, Lenwood G.: STS-1 and Beyond. Presented at the Peninsula Chapter of the Virginia Society of Professional Engineers, May 21, 1981, Hampton, Virginia.

PUBLICATIONS FOR AIRCRAFT ENERGY EFFICIENCY PROJECT OFFICE

Formal Reports

21. Anon: Advanced Aerodynamics and Active Controls - Selected NASA Research. NASA CP-2172, February 1981, 185 p.
(Avail: NTIS Subject Category 01 RTOP 534-02-13)
22. Anon: Advanced Aerodynamics - Selected NASA Research. NASA CP-2208, December 1981, 99 p.
(Avail: IAC Subject Category 01 RTOP 534-02-13)

Quick-Release Technical Memorandums

No quick-release technical memorandums.

Contractor Reports

23. Chovil, D. V.; Desper, O. E.; Harvey, S. T.; Jamison, E. S.; McCarty, J. E.; and Syder, H.: Advanced Composite Elevator for Boeing 727 Aircraft, Volume I - Technical Summary. (NAS1-14952 Boeing Commercial Airplane Company.) NASA CR-3290, November 1981, 93 p.
(Avail: IAC Subject Category 05 RTOP 534-03-13)
24. Dunning, E. G.; Cobbs, W. L.; and Legg, R. L.: Advanced Composite Aileron for L-1011 Transport Aircraft - Aileron Manufacture. (NAS1-15069 Lockheed-California Company; Subcontractor - AVCO Corporation.) NASA CR-165718, June 1981, 61 p.
(Avail: IAC Subject Category 24 RTOP 534-03-13)
25. Griffin, C. F.: Advanced Composite Aileron for L-1011 Transport Aircraft - Ground Tests and Flight Evaluation. (NAS1-15069 Lockheed-California Company.) NASA CR-165664, February 1981, 40 p.
(Avail: IAC Subject Category 24 RTOP 534-03-13)
26. Griffin, C. F.; Fogg, L. D.; and Dunning, E. G.: Advanced Composite Aileron for L-1011 Transport Aircraft - Design and Analysis. (NAS1-15069 Lockheed-California Company.) NASA CR-165635, March 1981, 172 p.
(Avail: IAC Subject Category 24 RTOP 534-03-13)
27. Jackson, A. C.; Crocker, J. F.; Ekvall, J. C.; Eudaily, R. R.; Mosesian, B.; Van Cleave, R. R.; and Hamersveld, J. Van: Advanced Manufacturing Development of a Composite Empennage Component for L-1011 Aircraft, Phase II - Final Report Design and Analysis. (NAS1-14000 Lockheed-California Company.) NASA CR-165634, April 1981, 215 p.
(Avail: IAC Subject Category 24 RTOP 534-03-13)
28. Staff of Boeing Commercial Airplane Company: Integrated Application of Active Controls (IAAC) Technology to an Advanced Subsonic Transport - Project Plan. (NAS1-14742 and NAS1-15325 Boeing Commercial Airplane Company.) NASA CR-3305, February 1981, 42 p.
(Avail: NTIS Subject Category 05 RTOP 534-02-13)

29. Staff of Boeing Commercial Airplane Company: Integrated Application of Active Controls (IAAC) Technology to an Advanced Subsonic Transport Project - Wing Planform Study and Final Configuration Selection. (NAS1-15325 Boeing Commercial Airplane Company.) NASA CR-165630, June 1981, 350 p.
(Avail: IAC Subject Category 05 RTOP 534-02-13)
30. Staff of Boeing Commercial Airplane Company: Flight Test Evaluation of Drag Effects on Surface Coatings on the NASA Boeing 737 TCV Airplane. (NAS1-15325 Boeing Commercial Airplane Company.) NASA CR-165767, June 1981, 98 p.
(Avail: IAC Subject Category 05 RTOP 534-02-13)
31. Staff of Boeing Commercial Airplane Company: Integrated Application of Active Controls (IAAC) Technology to an Advanced Subsonic Transport Project - Current and Advanced ACT Control System Definition Study - Volume I. (NAS1-14742 and NAS1-15325 Boeing Commercial Airplane Company.) NASA CR-165631, October 1981, 466 p.
(Avail: IAC Subject Category 05 RTOP 534-02-13)
32. Staff of Boeing Commercial Airplane Company: Integrated Application of Active Controls (IAAC) Technology to an Advanced Subsonic Transport Project - Current and Advanced ACT Control System Definition Study - Volume II, Appendices. (NAS1-14742 and NAS1-15325 Boeing Commercial Airplane Company.) NASA CR-165631, October 1981, 510 p.
(Avail: IAC Subject Category 05 RTOP 534-02-13)
33. Staff of Boeing Commercial Airplane Company: Integrated Application of Active Controls (IAAC) Technology to an Advanced Subsonic Transport Project - Wing Planform Study and Final Configuration Selection - Summary Report. (NAS1-15325 Boeing Commercial Airplane Company.) NASA CR-3468, October 1981, 43 p.
(Avail: IAC Subject Category 05 RTOP 534-02-13)
34. Staff of Douglas Aircraft Company: Selected Advanced Aerodynamic and Active Control Concepts Development - Summary Report. (NAS1-14744 McDonnell Douglas Corporation.) NASA CR-3469, October 1981, 78 p.
(Avail: IAC Subject Category 02 RTOP 534-02-13)
35. Staff of Douglas Aircraft Company: Experimental Investigation of Elastic Mode Control on a Model of a Transport Aircraft. (NAS1-15327 McDonnell Douglas Corporation.) NASA CR-3472, November 1981, 214 p.
(Avail: IAC Subject Category 05 RTOP 534-02-13)

Journal Articles and Periodical Literature

No journal articles and periodical literature.

Meeting/Conference Papers

36. Adams, William M., Jr.; and Tiffany, Sherwood H.: Central Law Design To Meet Constraints Using SYNPAK--Synthesis Package for Active Controls. Presented at the AIChE/ASME/IEEE/ISA/AIAA 1981 Joint Automatic Control Conference, June 17-19, 1981, Charlottesville, Virginia.
(Avail: NTIS, NASA TM-83264 Subject Category 39 RTOP 505-34-33)

37. Kreitinger, Richard L.; and Middleton, David B.: Aircraft Surface Coatings for Drag Reduction/Erosion Protection. Presented at the 1981 SAE Aerospace Congress and Exposition, October 5-8, 1981, Anaheim, California. Paper No. 811070.
(Avail: SAE Inc. Subject Category 05 RTOP 534-02-13)

Computer Programs

No computer programs.

Tech Briefs

No tech briefs.

Patents

No patents.

Oral Presentations to Conferences/Workshops

38. Hood, Ray V.: Status of Aircraft Energy Efficiency Active Controls Technology Program. Presented at the AIChE/ASME/IEEE/ISA/AIAA 1981 Joint Automatic Control Conference, June 17-19, 1981, Charlottesville, Virginia.
39. Leybold, H. A.; and Chapman, A. J.: Manufacturing Experience with ACEE Composites Structures for Commercial Transports. Presented to the MTAG Nonmetals/Composites Program Review, Orlando, Florida, February 23-25, 1981.

PUBLICATIONS FOR LARGE SPACE SYSTEMS TECHNOLOGY PROGRAM OFFICE

Formal Reports

40. Koprivier, Frank, III (compiler): Large Space Systems Technology - 1980. Volume I - Systems Technology. NASA CP-2168, February 1981, 460 p. (Avail: NTIS Subject Category 15 RTOP 506-62-43)
41. Koprivier, Frank, III (compiler): Large Space Systems Technology - 1980. Volume II - Base Technology. NASA CP-2168, February 1981, 196 p. (Avail: NTIS Subject Category 15 RTOP 506-62-43)

Quick-Release Technical Memorandums

No quick-release technical memorandums.

Contractor Reports

No contractor reports.

Journal Articles and Periodical Literature

No journal articles and periodical literature.

Meeting/Conference Papers

42. Russell, R. A.: Antenna Program Introduction. Presented at the Third Annual Large Space Systems Technology Review, November 16-19, 1981, Hampton, Virginia. (Avail: NTIS, NASA CP-2215 Subject Category 24 RTOP 506-62-43)

Computer Programs

No computer programs.

Tech Briefs

No tech briefs.

Patents

No patents.

Oral Presentations to Conferences/Workshops

No oral presentations to conferences/workshops.

PUBLICATIONS FOR ERBE/SAGE II/HALOE PROJECT OFFICE

Formal Reports

No formal reports.

Quick-Release Technical Memorandums

No quick-release technical memorandums.

Contractor Reports

No contractor reports.

Journal Articles and Periodical Literature

No journal articles and periodical literature.

Meeting/Conference Papers

No meeting/conference papers.

Computer Programs

No computer programs.

Tech Briefs

No tech briefs.

Patents

No patents.

Oral Presentations to Conferences/Workshops

No oral presentations to conferences/workshops.

PUBLICATIONS FOR OFFICE OF DIRECTOR FOR ELECTRONICS

Formal Reports

No formal reports.

Quick-Release Technical Memorandums

No quick-release technical memorandums.

Contractor Reports

No contractor reports.

Journal Articles and Periodical Literature

No journal articles and periodical literature.

Meeting/Conference Papers

No meeting/conference papers.

Computer Programs

No computer programs.

Tech Briefs

No tech briefs.

Patents

No patents.

Oral Presentations to Conferences/Workshops

No oral presentations to conferences/workshops.

PUBLICATIONS FOR ANALYSIS AND COMPUTATION DIVISION

Formal Reports

43. Anon: Numerical Grid Generation Techniques. NASA CP-2166, January 1981, 574 p.
(Avail: NTIS Subject Category 64 RTOP 505-31-83)
44. Nolan, Joseph D.: Design and Implementation of a Telecommunication Interface for the TAATM/TCV Real-Time Experiment. NASA TM-83231, December 1981, 24 p.
(Avail: NTIS Subject Category 04 RTOP 992-16-05)

Quick-Release Technical Memorandums

45. Houck, Jacob A.: A Pilot Training Manual for the Terminal Configured Vehicle Electronic Horizontal Situation Indicator. NASA TM-81959, March 1981, 63 p.
(Avail: NTIS Subject Category 03 RTOP 534-04-13)
46. Kibler, Kemper S.; and McDaniel, Gary A.: Application of a Local Linearization Technique for the Solution of a System for Stiff Differential Equations Associated With the Simulation of a Magnetic Bearing Assembly. NASA TM-83146, September 1981, 37 p.
(Avail: NTIS Subject Category 61 RTOP 506-61-43)
47. Markos, Athena T.: A Learning Guide for the Terminal Configured Vehicle Electronic Horizontal Situation Indicator. NASA TM-83128, June 1981, 35 p.
(Avail: NTIS Subject Category 03 RTOP 534-04-13)
48. Noland, Marie S.: An Evaluation of the Interactive Software Invocation System (ISIS) for Software Development Applications. NASA TM-81924, January 1981, 29 p.
(Avail: NTIS Subject Category 61 RTOP 506-61-43)
49. Smith, Kathryn A.: Requirements and Preliminary Design for a General Purpose Real-Time Executive for Flight Computers. NASA TM-83167, June 1981, 20 p.
(Avail: NTIS Subject Category 61 RTOP 506-61-43)
50. Smith, R. E.: Two-Boundary Grid Generation for the Solution of the Three-Dimensional Compressible Navier-Stokes Equations. NASA TM-83123, May 1981, 172 p.
(Avail: NTIS Subject Category 64 RTOP 505-31-83)

Contractor Reports

51. Anderson, Mark A.; and Callahan, Ron: Learning Guide for the Terminal Configured Vehicle Advanced Guidance and Control System Mode Select Panel. (NAS1-15673 Control Data Corporation.) NASA CR-165751, July 1981, 19 p.
(Avail: NTIS Subject Category 03 RTOP 534-04-13)
52. Gridley, Doreen: An Introduction to Time Series Analysis and Data Reduction Programming Capabilities. (NAS1-15400 System Development Corporation.) NASA CR-165782, June 1981, 78 p.
(Avail: STIF Subject Category 65 RTOP 992-16-04)

53. Myers, Raymond H.: Methods for Presentation and Display of Multivariate Data. (L-72497A Raymond H. Myers.) NASA CR-165788, September 1981, 17 p.
(Avail: NTIS Subject Category 65 RTOP 505-35-33)
54. Myers, Raymond H.: Applications of Non-Parametric Statistics and Analysis of Variance on Sample Variances. (L-72497A Raymond H. Myers.) NASA CR-165789, September 1981, 97 p.
(Avail: NTIS Subject Category 65 RTOP 505-35-33)
55. Shah, Shantilal N.: STAR Adaptation of QR Algorithm. (NCC1-7 Hampton Institute.) NASA CR-165730, June 1981, 28 p.
(Avail: NTIS Subject Category 64 RTOP 505-31-83)
56. Shah, Shantilal N.: STAR Adaptation of QR Algorithm for Overdetermined Linear Systems With Complex Coefficients. (NCC1-7 Hampton Institute.) NASA CR-165731, June 1981, 25 p.
(Avail: NTIS Subject Category 64 RTOP 505-31-83)

Journal Articles and Periodical Literature

No journal articles and periodical literature.

Meeting/Conference Papers

57. Knight, John C.; and Dunlop, Douglas D.: Measurements of an Optimizing Compiler for a Vector Computer. Presented at the IEEE Computer Society 1981 International Conference on Parallel Processing, August 25-28, 1981, Bellair, Michigan.
(Avail: IEEE Subject Category 61 RTOP 505-31-83)
58. Smith, R. E.; and Speray, D. E.: Color Visualization for Fluid Flow Prediction. Presented at the ASME Winter Annual Meeting, November 15-20, 1981, Washington, D.C.
(Avail: ASME Subject Category 64 RTOP 505-31-83)
59. Steinmetz, G. G.; Person, L. H.; and Morello, S. A.: Have We Overlooked the Pilot's Role in an Automated Flight Deck? Presented at the AIAA/IEEE 4th Digital Avionics Systems Conference, November 17-19, 1981, St. Louis, Missouri. AIAA Paper No. 81-2262.
(Avail: AIAA Subject Category 06 RTOP 534-04-13)

Computer Programs

60. Higher Order Software, Inc.: Flowcharter: A Universal Structured Design Diagrammer. Program No. LAR-12548. NASA Accession No. M80-10062. Released 1981.
(Avail: COSMIC Subject Category 61)
61. Smith, Rudeen S.; and Noland, Marie S.: Interpretive Computer Simulator for the NASA Standard Spacecraft Computer-II. Program No. LAR-12603. NASA Accession No. M80-10045. Released 1981.
(Avail: COSMIC Subject Category 19)

Tech Briefs

62. Higher Order Software, Inc.: A Universal Structural-Design Diagrammer. NASA Tech Brief LAR-12548. Released 1981.
(Avail: NASA Langley Technology Utilization Office
Category: Mathematics and Information Sciences)
63. Tulppo, John S. (Sperry Rand Corp.): Graphics-System Color-Coded Interface. NASA Tech Brief LAR-12646. Released 1981.
(Avail: NASA Langley Technology Utilization Office
Category: Electronic Components and Circuits)

Patents

64. Ashworth, Billy R.; Hall, Alton C.; and Clark, Clyde E.: Helmet Wright Simulator. U.S. Patent 4,264,310. Issued 1981.
(Avail: U.S. Patent & Trademark Office Subject Category 54)

Oral Presentations to Conferences/Workshops

65. Bowen, John: PRIME Graphics: A Status Report. Presented at the Workshop on Computer-Aided Modeling, Analysis, Design, and Fabrication, February 9-12, 1981, Hampton, Virginia.
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Contractor Reports

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No journal articles and periodical literature.

Meeting/Conference Papers

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PUBLICATIONS FOR FACILITIES ENGINEERING DIVISION

Formal Reports

No formal reports.

Quick-Release Technical Memorandums

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Contractor Reports

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Journal Articles and Periodical Literature

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Tech Briefs

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Patents

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(Avail: U.S. Patent & Trademark Office Subject Category 34)

Oral Presentations to Conferences/Workshops

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PUBLICATIONS FOR OPERATIONS SUPPORT DIVISION

Formal Reports

No formal reports.

Quick-Release Technical Memorandums

No quick-release technical memorandums.

Contractor Reports

No contractor reports.

Journal Articles and Periodical Literature

No journal articles and periodical literature.

Meeting/Conference Papers

No meeting/conference papers.

Computer Programs

No computer programs.

Tech Briefs

No tech briefs.

Patents

No patents.

Oral Presentations to Conferences/Workshops

No oral presentations to conferences/workshops.

PUBLICATIONS FOR OFFICE OF DIRECTOR FOR MANAGEMENT OPERATIONS

Formal Reports

1390. Mathes, J. C.; and Pinelli, Thomas E. (compilers): Technical Communication - Perspectives for the Eighties. NASA CP-2203, Part 1, December 1981, 237 p. (Avail: NTIS Subject Category 82)
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1395. Report and Manuscript Control Office (compiler): Scientific and Technical Information Output of the Langley Research Center for Calendar Year 1980. NASA TM-81950, February 1981, 245 p. (Avail: NTIS Subject Category 82)

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Meeting/Conference Papers

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(Avail: University of Michigan, Proceedings Subject Category 82)
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(Avail: NTIS, NASA TM-81966, p. 5-16 Subject Category 82)

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Tech Briefs

1402. Carr, Kenneth L. (Microwave Associates, Inc.): Compact Dual-Mode Microwave Antenna. NASA Tech Brief LAR-12784. Released 1981.
(Avail: NASA Langley Technology Utilization Office
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Patents

No patents.

Oral Presentations to Conferences/Workshops

No oral presentations to conferences/workshops.

PUBLICATIONS FOR ARMY STRUCTURES LABORATORY (AVRADCOM)

Formal Reports

No formal reports.

Quick-Release Technical Memorandums

No quick-release technical memorandums.

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1403. Eastman, L. B.: Main Rotor Six Degree-of-Freedom Isolation System Analysis. (NAS1-16168 Sikorsky Aircraft - United Technologies Corporation.) NASA CR-165665, May 1981, 56 p.
(Avail: NTIS Subject Category 05 RTOP 505-10-39)
1404. Flannelly, W. G.; Fabunmi, J. A.; and Nagy, E. J.: Analytical Testing. (NAS1-15414 Kaman Aerospace Corporation.) NASA CR-3429, May 1981, 152 p.
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1405. Halwes, Dennis R.: Total Main Rotor Isolation System Analysis. (NAS1-16211 Bell Helicopter Textron.) NASA CR-165667, June 1981, 141 p.
(Avail: NTIS Subject Category 05 RTOP 505-10-39)
1406. Sankewitsch, V.: Total Main Rotor Isolation System Analysis. (NAS1-16176 Boeing Vertol Company.) NASA CR-165666, March 1981, 80 p.
(Avail: NTIS Subject Category 05 RTOP 505-10-39)

Journal Articles and Periodical Literature

No journal articles and periodical literature.

Meeting/Conference Papers

No meeting/conference papers.

Computer Programs

No computer programs.

Tech Briefs

No tech briefs.

Patents

No patents.

Oral Presentations to Conferences/Workshops

No oral presentations to conferences/workshops.

APPENDIX

INDUSTRIAL APPLICATIONS CENTERS

Aerospace Research Applications Center
1201 East 38th Street
Indianapolis, IN 46205
(317) 264-4644

Kerr Industrial Applications Center
Southeastern Oklahoma State University
Station A, Box 2584
Durant, OK 74701
(405) 924-6822

NASA Industrial Applications Center
701 LIS Building
University of Pittsburgh
Pittsburgh, PA 15260
(412) 624-5211

NASA Industrial Applications Center
University of Southern California
Denny Research Building
University Park
Los Angeles, CA 90007
(213) 743-6132

New England Research Applications Center
Mansfield Professional Park
Storrs, CT 06268
(203) 486-4533

North Carolina Science and Technology Research Center
Post Office Box 12235
Research Triangle Park, NC 27709
(919) 549-0671

Technology Applications Center
University of New Mexico
2500 Central Avenue, SE
Albuquerque, NM 87131
(505) 277-3622

NASA/Florida State Technology Applications Center
State University System of Florida
500 Weil Hall
Gainesville, FL 32611
(904) 392-6626

NASA/UK Technology Applications Program
University of Kentucky
109 Kinkead Hall
Lexington, KY 40506

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