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Produced by the NASA Center for Aerospace Information (CASI)
Scientific and Technical Information
Output of the Langley Research Center
for Calendar Year 1984

JANUARY 1985
NASA Technical Memorandum 86336

Scientific and Technical Information
Output of the Langley Research Center
for Calendar Year 1984

Compiled by
Research Information and Applications Division
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 1984.

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 the calendar year 1984, Langley's contributions to NASA and non-NASA literature included 150 NASA Formal Reports, 144 Quick-Release Technical Memorandums, 277 Contractor Reports, 241 Journal Articles and Other Publications, 497 Meeting Presentations, 168 Technical Talks, 30 Computer Programs, 120 Tech Briefs, and 26 Patents. In addition, during the year 18 conferences, symposia, and workshops were sponsored or cosponsored by Langley and held locally.

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.

Andrew J. Hansbrough
Assistant Chief, Research Information and Applications Division
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<td>3. NASA 5th NIA Region II Technical Student Symposium</td>
<td>Mar. 30-31</td>
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<td>4. A New Direction in Structural Analysis</td>
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<td>7. 107th Meeting of the Acoustical Society of America</td>
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<td>8. Workshop on Wind Shear/Turbulence Inputs to Flight Simulation and Systems Certification</td>
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<td>13. Workshop on Theoretical Approaches to Turbulence</td>
<td>Oct. 10-12</td>
<td>D. L. Dwyer</td>
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<td>16. SAE/NASA 2nd Aircraft Interior Noise Meeting</td>
<td>Oct. 18-19</td>
<td>J. S. Mixson</td>
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<tr>
<td>18. Large Space Antenna Systems Technology-1984 Conference</td>
<td>Dec. 4-6</td>
<td>C. A. Lightner</td>
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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, structures and materials, acoustics and noise reduction, measurement 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 1984 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 document 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 systems. Details of the availability of the research references in this document are found in the section, "Availability," on page vii.

The citations are grouped first by Langley Directorates, then by the Langley Office or Division to which the senior author or innovator belongs. Citations are listed alphabetically by author or innovator under the following headings: Formal Reports (Technical Papers, Technical Memorandums, Conference Publications, Reference Publications, and Special Publications), Quick-Release Technical Memorandums, Contractor Reports, Journal Articles, Other Publications, Meeting Presentations, Technical Talks, Computer Programs, Tech Briefs, and Patents. If a citation has more than one author, it is listed only once under the first author's name. The subject category number used to index the citation and the Research Technology Objectives and Plans (RTOP) number are noted below citations when appropriate.

Computer Programs listed are those which were submitted by Langley to COSMIC in 1984.

The NASA Tech Briefs cited have either been published1 or submitted in 1984 for publication in "NASA Tech Briefs," a quarterly journal for United States industry, entrepreneurs, and academia. Free Subscriptions to this journal are available through the publisher, NASA Tech Briefs, 41 East 42nd Street, Suite 921, New York, New York 10017 or the NASA Technology Utilization Program by writing to the Technology Utilization Office, 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. A subscription to STAR is available from the U.S. Government Printing Office (GPO) or to qualified recipients from the NASA Scientific and Technical Information Facility (STIF).

1Those submitted in 1983 (and therefore listed in the 1983 issue of this document) but published in 1984 have not been listed.
Publication of some journal articles was not known at press time for the 1983 issue of this document. These articles are therefore listed in the 1984 issue.
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<td>5285 Port Royal Road</td>
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<td>Contractor Reports</td>
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<td>Computer Programs</td>
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Quick-Release Technical Memorandums

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Contractor Reports

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   (Avail: NTIS Subject Category 59 RTOP 505-31-83)


   (NASI-17070 Institute for Computer Applications in Science and 
   (Avail: NTIS Subject Category 64 RTOP 505-31-83)

18. Elcrat, A. R.; and Trefethen, L. N.: Classical Free-Streamline Flow Over a 
   Polygonal Obstacle. (NAS1-17070 Institute for Computer Applications in 
   (Avail: NTIS Subject Category 34 RTOP 505-31-83)

   Complexity in the Design of Parallel Numerical Algorithms. (NAS1-17070 
   and NAS1-17130 Institute for Computer Applications in Science and 
   (Avail: NTIS Subject Category 60 RTOP 505-31-83)

20. Gatski, T. B.; and Grosch, C. E.: A Numerical Study of the Two- and Three- 
    Dimensional Unsteady Navier-Stokes Equations in Velocity-Vorticity 
    Variables Using Compact Difference Schemes. (NASI-17070 Institute for 
    Computer Applications in Science and Engineering.) NASA CR-172353, May 
   (Avail: NTIS Subject Category 64 RTOP 505-31-83)

    TVD Schemes. (NAS1-17070 Institute for Computer Applications in Science 
   (Avail: NTIS Subject Category 64 RTOP 505-31-83)

   Institute for Computer Applications in Science and Engineering.) NASA 
   (Avail: NTIS Subject Category 64 RTOP 505-31-83)

23. Gozani, J.; Nachshon, A.; and Turkel, E.: Conjugate Gradient Coupled With 
    Multigrid for an Indefinite Problem. (NASI-17130 Institute for Computer 
   (Avail: NTIS Subject Category 64 RTOP 505-31-83)

24. Graif, E.; and Kunisch, K.: Parameter Estimation for the Euler-Bernoulli- 
    Beam. (NASI-17070 Institute for Computer Applications in Science and 
   (Avail: NTIS Subject Category 64 RTOP 505-31-83)

    a System of First Order Equations. (NASI-17070 Institute for Computer 
   (Avail: NTIS Subject Category 64 RTOP 505-31-83)

    Boundary Layers. (NASI-17070 Institute for Computer Applications in 
   (Avail: NTIS Subject Category 34 RTOP 505-31-83)
Attachment Line Boundary Layer: Weakly Nonlinear Theory and a Numerical
Approach. (NAS1-17070 Institute for Computer Applications in Science and
(Avail: NTIS Subject Category 34 RTOP 505-31-83)

Swept Attachment Line Boundary Layer. (NAS1-17070 Institute for Computer
Applications in Science and Engineering, NAS1-16916 High Technology
Corporation, and NAS1-14605 George Washington University.) NASA
(Avail: NTIS Subject Category 02 RTOP 505-31-83)

Using Euler Computations. (NAS1-17070 Institute for Computer Applications
(Avail: NTIS Subject Category 64 RTOP 505-31-83)

Methods for the Euler Equations: Chebyshev Methods and Shock-Fitting.
(NAS1-17070 and NAS1-17130 Institute for Computer Applications in Science
(Avail: NTIS Subject Category 64 RTOP 505-31-83)

31. Hussaini, M. Y.; Kopriva, D. A.; Salas, M. D.; and Zang, T. A.: Spectral
Methods for the Euler Equations: Fourier Methods and Shock-Capturing.
(NAS1-17070 and NAS1-17130 Institute for Computer Applications in Science
(Avail: NTIS Subject Category 64 RTOP 505-31-83)

32. Hussaini, M. Y.; and Lakin, W. D.: Existence and Non-Uniqueness of
Similarity Solutions of a Boundary Layer Problem. (NAS1-17070 Institute
for Computer Applications in Science and Engineering.) NASA CR-172503,
December 1984, 18 p.
(Avail: NTIS Subject Category 34 RTOP 505-31-83)

(NAS1-17070 Institute for Computer Applications in Science and
(Avail: NTIS Subject Category 64 RTOP 505-31-83)

(NAS1-17070 Institute for Computer Applications in Science and
(Avail: NTIS Subject Category 64 RTOP 505-31-83)

35. Ito, K.: Legendre-Tau Approximation for Functional Differential Equations,
Part III: Eigenvalue Approximations and Uniform Stability. (NAS1-17070
Institute for Computer Applications in Science and Engineering.) NASA
(Avail: NTIS Subject Category 64 RTOP 505-31-83)


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Journal Articles and Other Publications


Meeting Presentations

No meeting presentations.

Technical Talks

No technical talks.

Computer Programs

No computer programs.

Tech Briefs

No tech briefs.

Patents

No patents.
PUBLICATIONS FOR OFFICE OF DIRECTOR FOR PROJECTS

Formal Reports
No formal reports.

Quick-Release Technical Memorandums
No quick-release technical memorandums.

Contractor Reports
No contractor reports.

Journal Articles and Other Publications
No journal articles and other publications.

Meeting Presentations
(Subject Category 02 RTOP 505-43-43)

Technical Talks
(Subject Category 24 RTOP 534-06-13)

Computer Programs
No computer programs.

Tech Briefs
No tech briefs.

Patents
No patents.
Formal Reports

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Quick-Release Technical Memorandums

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**Contractor Reports**


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Computer Programs

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Tech Briefs


Patents

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No formal reports.

Quick-Release Technical Memorandums
No quick-release technical memorandums.

Contractor Reports
No contractor reports.

Journal Articles and Other Publications
No journal articles and other publications.

Meeting Presentations


Technical Talks
No technical talks.

Computer Programs
No computer programs.

Tech Briefs
No tech briefs.

Patents
No patents.
PUBLICATIONS FOR LONG DURATION EXPOSURE FACILITY PROJECT OFFICE

Formal Reports


Quick-Release Technical Memorandums

No quick-release technical memorandums.

Contractor Reports

No contractor reports.

Journal Articles and Other Publications

No journal articles and other publications.

Meeting Presentations

No meeting presentations.

Technical Talks

No technical talks.

Computer Programs

No computer programs.

Tech Briefs

No tech briefs.

Patents

No patents.
PUBLICATIONS FOR AIRCRAFT ENERGY EFFICIENCY PROJECT OFFICE

Formal Reports


Quick-Release Technical Memorandums


Contractor Reports


Journal Articles and Other Publications


Meeting Presentations


Technical Talks

No technical talks.
Computer Programs

No computer programs.

Tech Briefs


Patents

(Subject Category 37)
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 Other Publications
No journal articles and other publications.

Meeting Presentations
No meeting presentations.

Technical Talks
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Computer Programs
No computer programs.

Tech Briefs
No tech briefs.

Patents
No patents.
Formal Reports


Quick-Release Technical Memorandums


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Meeting Presentations


Technical Talks


Computer Programs


Tech Briefs


Patents

No patents.
PUBLICATIONS FOR INSTRUMENT RESEARCH DIVISION

Formal Reports


Quick-Release Technical Memorandums


Contractor Reports


Journal Articles and Other Publications


Meeting Presentations


213. Zuckerwar, A. J.; and Meredith, R. W.: Low-Frequency Sound Absorption in Air. Presented at the 107th Meeting of the Acoustical Society of America, May 7-10, 1984, Norfolk, Virginia. Published in the Journal of the Acoustical Society of America, Supplement 1, Volume 75, Spring 1984, p. 34. (Subject Category 71 RTOP 505-31-33)

Technical Talks


(Subject Category 88 RTOP 694-80-70)

(Subject Category 71 RTOP 505-33-23)

(Subject Category 71 RTOP 505-33-23)

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Computer Programs

No computer programs.

Tech Briefs


Patents


PUBLICATIONS FOR FLIGHT DYNAMICS AND CONTROL DIVISION

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Quick-Release Technical Memorandums


Contractor Reports


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Meeting Presentations

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(Subject Category 05 RTOP 505-34-03)

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Technical Talks


Computer Programs

320. Jones, R. L.: IMAGES - Interactive Modal Analysis and Gain Estimation System. Program No. LAR-13334. (Subject Category 08)
(Subject Category 62)

Tech Briefs


Patents

No patents.
PUBLICATIONS FOR FLIGHT ELECTRONICS DIVISION

Formal Reports


Quick-Release Technical Memorandums


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450. Frost, W.; and Bowles, R. L.: Incorporation of Wind Shear Terms Into the Governing Equations of Aircraft Motion. Presented at the AIAA 22nd Aerospace Sciences Meeting, January 9-12, 1984, Reno, Nevada. AIAA Paper No. 84-0275. (Subject Category 05 RTOP 505-35-33)


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No formal reports.

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No quick-release technical memorandums.

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801. Taylor, L. T.; and St. Clair, A. K.: Mechanical and Spectroscopic  
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871. *Everett, R. A., Jr.: Failure Modes of Realistic Bonded Metal to Composite Joints. Presented at the VPI&SU Center for Adhesion Science Program Review/Workshop, April 29 – May 2, 1984, Blacksburg, Virginia. (Subject Category 27 RTOP 505-33-33)


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897. St. Clair, T. L.: Thermosetting Polyimides. Presented at the Japan Thermosetting Plastics Industry Association, Special Program on Thermally Stable Polymers, November 6-7, 1984, Osaka, Japan. (Subject Category 27 RTOP 505-33-33)
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No quick-release technical memorandums.

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No journal articles and other publications.

Meeting Presentations
No meeting presentations.

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(Avail: NTIS Subject Category 02 RTOP 505-43-93)

(Avail: NTIS Subject Category 02 RTOP 505-43-90)


(Avail: NTIS Subject Category 02 RTOP 505-31-53)

Journal Articles and Other Publications


Meeting Presentations


Technical Talks

1141. Alston, D. W.: Overview - The Data Acquisition/Reduction/Analysis System of the Langley 16-Foot Transonic Tunnel. Presented at the 56th Annual Convention of the National Technical Association, July 25-28, 1984, Cleveland, Ohio. (Subject Category 02  RTOP 505-43-33)


1143. Dress, D. A.; Lawing, P. L.; and Kilgore, R. A.: 0.3-m Transonic Cryogenic Tunnel's Insulation System. Presented at the 61st Semiannual Meeting of the Supersonic Tunnel Association, March 12-14, 1984, Cleveland, Ohio. (Subject Category 09  RTOP 505-31-53)


1147. Mineck, R. E.: Status of the Adaptive Wall Test Section for the 0.3-m Transonic Cryogenic Tunnel. Presented at the DFVLR European Mechanics Colloquium 187 on Adaptive Wall Wind Tunnels and Wall Interference Correction Methods, October 15-17, 1984, Gottingen, Federal Republic of Germany. (Subject Category 02  RTOP 505-31-53)

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Patents


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Quick-Release Technical Memorandums


Contractor Reports


Journal Articles and Other Publications


Meeting Presentations


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(Subject Category 02  RTOP 505-43-23)

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(Subject Category 02 RTOP 505-41-13)

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at the 32nd Experimental Aircraft Association Convention, July 26 - August 1,
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N. R. (Langley Research Center); and Chapman, J. J. (Kentron
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Patents

No patents.

*Army Structures Laboratory (AVSCOM)
PUBLICATIONS FOR HIGH-SPEED AERODYNAMICS DIVISION

Formal Reports


(Avail: STIF  Subject Category 02  RTOP 505-43-83)

(Avail: NTIS  Subject Category 34  RTOP 505-31-13)

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(Avail: STIF  Subject Category 07  RTOP 505-43-83)
Contractor Reports


Journal Articles and Other Publications

1261. Allen, J. M.; and Pittman, J. L.: Analysis of Surface Pressure Distributions on Two Elliptic Missile Bodies. Journal of Spacecraft and Rockets, Volume 21, No. 6, November - December 1984, p. 528. (Subject Category 02 RTOP 505-43-23)


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Computer Programs

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1330. Rosen, B. S.; and Mason, W. H. (Grumman Aerospace Corporation): W12SC3 (Computer Program). Program No. LAR-13239. (Subject Category 02)

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PUBLICATIONS FOR OFFICE OF DIRECTOR FOR SPACE

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Quick-Release Technical Memorandums
No quick-release technical memorandums.

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(Avail: NTIS Subject Category 51 RTOP 199-30-36)

(Avail: NTIS Subject Category 46 RTOP 665-10-40)

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(SUBJECT CATEGORY 45 RTOP 146-20-10)

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1417. Anderson, I. C.; and Levine, J. S.: Biogenic Production of Nitric and Nitrous Oxides. Presented at the 84th Annual Meeting of the American Society for Microbiology, March 4-9, 1984, St. Louis, Missouri. Published in Abstracts of the Annual Meeting, March 1984, p. 179. (Subject Category 46 RTOP 176-20-02)

1418. Benner, D. C.; and Rinsland, C. P.: Identification and Intensities of the 'Forbidden' 03^3\ P < 00^0 Band of ^12\ C^16\ O_2. Presented at the Ohio State University 39th Annual Symposium on Molecular Spectroscopy, June 11-15, 1984, Columbus, Ohio. Abstract in Proceedings, p. 53. (Subject Category 45 RTOP 147-44-02)


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(Subject Category 47 RTOP 176-40-04)

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(Subject Category 46 RTOP 673-41-07)

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(Subject Category 45 RTOP 147-44-02)

(Subject Category 46 RTOP 673-41-10)

(Subject Category 47 RTOP 673-62-02)

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Technical Talks


1463. Levine, J. S.: Global Changes in Tropospheric Composition: Chemical and Climate Implications. Presented at the 17th Annual Meeting, Technical Advisory Committee, State Air Pollution Control Board, October 2, 1984, Virginia Beach, Virginia. (Subject Category 46 RTOP 176-20-02)


   (Subject Category 47 RTOP 672-40-06)

   (Subject Category 72 RTOP 147-23-11)

Computer Programs

No computer programs.

Tech Briefs


Patents

No patents.
### PUBLICATIONS FOR SPACE SYSTEMS DIVISION

**Formal Reports**

(Avail: NTIS Subject Category 36 RTOP 506-55-73)

(Avail: NTIS Subject Category 15 RTOP 506-51-13)

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(Avail: NTIS Subject Category 73 RTOP 199-20-76)

(Avail: NTIS Subject Category 73 RTOP 199-20-76)

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1515. Miller, C. G., III: Heating Distributions for a 0.006-Scale Shuttle Orbiter Over a Range of Hypersonic Flow Conditions. Journal of Spacecraft and Rockets, Volume 21, No. 1, January - February 1984, p. 120-122. (Subject Category 34 RTOP 506-51-13)


1523. Ware, G. M.; Spencer, B., Jr.; and Gentry, L. R.: Remotely Controlled Models Slash Tunnel Time. *Astronautics and Aeronautics*, Volume 22, No. 3, March 1984, p. 64-70. (Subject Category 01 RTOP 506-51-13)


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1578. Zoby, E. V.; Gupta, R. N.; and Simmonds, A. L.: Temperature-Dependent Reaction-Rate Expression for Oxygen Recombination at Shuttle Entry Conditions. Presented at the AIAA 22nd Aerospace Sciences Meeting, January 9-12, 1984, Reno, Nevada. AIAA Paper No. 84-0224. (Subject Category 34 RTOP 506-51-13)


Technical Talks

1580. DeYoung, R. J.: Low Threshold Long Gain Length Solar-Pumped C3F7I Laser. Presented at the American Physical Society Thirty-Seventh Gaseous Electronics Conference, October 9-12, 1984, Boulder, Colorado. (Subject Category 36 RTOP 506-55-73)


1591. Walberg, G. D.: NASA Perspectives in Space. Presented at the Texas A&M University Fourth Annual Texas Engineering Experiment Station Research Conference, January 11-12, 1984, College Station, Texas. (Subject Category 15 RTOP 506-51-13)


Computer Programs

No computer programs.

Tech Briefs


Patents

Formal Reports
No formal reports.

Quick-Release Technical Memorandums
No quick-release technical memorandums.

Contractor Reports
No contractor reports.

Journal Articles and Other Publications
No journal articles and other publications.

Meeting Presentations
No meeting presentations.

Technical Talks
No technical talks.

Computer Programs
No computer programs.

Tech Briefs
No tech briefs.

Patents
No patents.
PUBLICATIONS FOR SYSTEMS SAFETY, QUALITY AND RELIABILITY OFFICE

Formal Reports
No formal reports.

Quick-Release Technical Memorandums
No quick-release technical memorandums.

Contractor Reports
No contractor reports.

Journal Articles and Other Publications
No journal articles and other publications.

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No meeting presentations.

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Computer Programs
No computer programs.

Tech Briefs
No tech briefs.

Patents
No patents.

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Formal Reports


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No quick-release technical memorandums.

Contractor Reports

No contractor reports.

Journal Articles and Other Publications

No journal articles and other publications.

Meeting Presentations


Technical Talks

No technical talks.

Computer Programs

No computer programs.

Tech Briefs


Patents

1614. Fox, R. L.; Frizzle, A. W.; Little, B. D.; Progar, D. J.; Coutrip, R. H.; Couch, R. H.; *Gleason, J. R.; Stein, B. A.; Buckley, J. D.; and St. Clair, T. L.: Hot Melt Adhesive Attachment Pad. U.S. Patent 4,488,335. (Subject Category 37)
PUBLICATIONS FOR SYSTEMS ENGINEERING DIVISION

Formal Reports


Quick-Release Technical Memorandums


Contractor Reports

No contractor reports.

Journal Articles and Other Publications


Meeting Presentations


Technical Talks

1631. Pegg, R. J.; and Youngblood, J. W.: A Novel Sun-Powered Flying Wing for High Altitude, Extended Missions. Presented at the Association for Unmanned Vehicle Systems (AUVS), Prospects for Very Long Endurance Aircraft (VLEA), September 19-20, 1984, Menlo Park, California. (Subject Category 05 RTOP 505-43-53)

Computer Programs

No computer programs.

Tech Briefs


Patents

No patents.
PUBLICATIONS FOR FACILITIES ENGINEERING DIVISION

Formal Reports
No formal reports.

Quick-Release Technical Memorandums

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Contractor Reports
No contractor reports.

Journal Articles and Other Publications
No journal articles and other publications.

Meeting Presentations
No meeting presentations.

Technical Talks
No technical talks.

Computer Programs
No computer programs.

Tech Briefs
No tech briefs.

Patents
No patents.
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 Other Publications
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Meeting Presentations

Technical Talks
No technical talks.

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No computer programs.

Tech Briefs


Formal Reports

No formal reports.

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No computer programs.

Tech Briefs

No tech briefs.

Patents

No patents.
PUBLICATIONS FOR ARMY STRUCTURES LABORATORY (AVSCOM)

Formal Reports


Quick-Release Technical Memorandums

No quick-release technical memorandums.

Contractor Reports


Journal Articles and Other Publications

No journal articles and other publications.

Meeting Presentations

No meeting presentations.

Technical Talks

No technical talks.

Computer Programs


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Patents

No patents.
APPENDIX

INDUSTRIAL APPLICATIONS CENTERS

Aerospace Research Applications Center
Indianapolis Center for Advanced Research
611 N. Capital Avenue
Indianapolis, IN 46204
(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
710 LIS Building
University of Pittsburgh
Pittsburgh, PA 15260
(412) 624-5211

NASA Industrial Applications Center
University of Southern California
Research Annex, Room 200
3716 South Hope Street
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
Albuquerque, NM 87131
(505) 277-3622

NASA/Florida State Technology Applications Center
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