Scientific and Technical Information
Output of the Langley Research Center
for Calendar Year 1980

FEBRUARY 1981
Scientific and Technical Information
Output of the Langley Research Center
for Calendar Year 1980

Compiled by
Report and Manuscript Control Office,
Scientific and Technical Information Programs Division
Langley Research Center
Hampton, Virginia
FOREWORD

This report contains the research output of the Center for calendar year 1980. This report is published annually in an attempt to effect greater awareness and distribution of the Center's research output.

The 1980 report displays several new features designed to enhance its usefulness. Emphasis has been placed on archival or documented research. Particular care has been taken to provide complete citations, including source of availability.


Comments regarding the usefulness of the report are welcomed as are suggestions for improving its usefulness. Comments/suggestions should be addressed to the Report and Manuscript Control Office (RAMCO), Mail Stop 180A, NASA Langley Research Center, Hampton, Virginia 23665, (804) 827-3251 or 827-2301.

Donald P. Hearth
Director
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INTRODUCTION

The Langley Research Center is one of the leading national laboratories for research and development in the sciences of aeronautics and space technology. For more than 60 years, Langley engineers and scientists have conducted basic and applied research in fluid and flight mechanics, flight systems, structures and materials, acoustics and noise reduction, measurements and instrumentation systems, data systems, and space and Earth sciences. The results of this research are disseminated through NASA scientific and technical publications as well as through a variety of non-NASA media. The Center's research output is processed through Langley's Scientific and Technical Information (STI) Program, which is an integral part of the NASA Scientific and Technical Information System. The Center's STI program is managed by the Scientific and Technical Information Programs Division (STIPD).

The new features that have been added to the report this year include author, NASA subject category, RTOP, and Tech Brief subject indexes. The categories have been expanded to include Computer Programs, Tech Briefs, and Patents. Each of these new categories is described below.

The computer programs listed in this document have been announced in recent issues of "Computer Program Abstracts," which were released in calendar year 1980. "Computer Program Abstracts," is an indexed journal containing abstracts of documented computer programs developed by NASA, NASA contractors, and other Federal Agencies. These computer programs are offered for sale through the NASA-sponsored Computer Software Management and Information Center (COSMIC) located at the University of Georgia.

The Tech Briefs listed in this document have been published in recent issues of "NASA Tech Briefs," which were released in 1980. "NASA Tech Briefs," a quarterly publication, is distributed free to engineers in U.S. industry and to other domestic technology transfer agents. It is both a current awareness document and a problem solving tool. For information on subscription to NASA Tech Briefs and other publications and services available through the NASA Technology Utilization Program, write to the Director, Technology Transfer Division, NASA Scientific and Technical Information Facility, P. O. Box 8757, Baltimore/Washington International Airport, Maryland 21240.

Patents owned in whole or part by Langley research personnel and listed in this document have been published in recent issues of "Scientific and Technical Aerospace Reports" (STAR). STAR, the NASA announcement journal for report literature, 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 Facility. NASA Patent Application Specifications are sold by the National Technical Information Service (NTIS). Printed (paper) copies of patents are available for purchase from the Commissioner of Patents.

The citations are listed first by Division or Office and then under the following headings: Formal Reports, Quick-Release Technical Memorandums, Contractor Reports, Journal Articles, Meeting/Conference Papers, Computer Programs, Tech Briefs, Patents, and Unpublished Research. Under each heading, the citations are listed by author in alphabetical order. If a report has more than one author and those authors are from different Divisions or Offices, the citation is listed only once, under the senior author's name. Tech Briefs are listed under the main innovator's name. This is not necessarily the order in which the innovators' names appear on the Tech Brief.
A publication of this magnitude requires the efforts of many individuals. Special recognition is given to the Scientific and Technical Information Coordinators who were responsible for ensuring the accuracy of their respective Division or Office submittals, the Office of Technology Utilization and Applications Programs for providing the Tech Brief and Computer Program listings, and the Office of Patent Counsel for providing the Patent listings. Finally, a note of thanks and appreciation to those individuals in the Technical Editing Branch of STIPD, who typed, proofread, and indexed the report.
**AVAILABILITY**

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Contractor Reports

(Avail: NTIS Subject Category 80 RTOP 340-00-00)

Journal Articles

(Avail: JGRL Subject Category 91 RTOP 889-52-03)

Meeting/Conference Papers

(Avail: AIAA Subject Category 01 RTOP 530-04-13)

Computer Programs

No computer programs.

Tech Briefs

No tech briefs.

Patents

No patents.

Unpublished Research


PUBLICATIONS FOR OFFICE OF DIRECTOR FOR PROJECTS

Formal Reports


Quick-Release Technical Memorandums

No quick-release technical memorandums.

Contractor Reports


Journal Articles

No journal articles.

Meeting/Conference Papers


Computer Programs

No computer programs.

Tech Briefs


Patents

No patents.
Unpublished Research


PUBLICATIONS FOR SCOUT PROJECT OFFICE

Formal Reports

No formal reports.

Quick-Release Technical Memorandums

No quick-release technical memorandums.

Contractor Reports


Journal Articles

No journal articles.

Meeting/Conference Papers

No meeting/conference papers.

Computer Programs

No computer programs.

Tech Briefs

No tech briefs.

Patents


Unpublished Research

No unpublished research.
PUBLICATIONS FOR AIRCRAFT ENERGY EFFICIENCY PROJECT OFFICE

Formal Reports

(Avail: NTIS Subject Category 24 RTOP 534-03-13)

Quick-Release Technical Memorandums

No quick-release technical memorandums.

Contractor Reports

(Avail: IAC Subject Category 05 RTOP 534-03-13)

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(Avail: IAC Subject Category 05 RTOP 534-02-13)


Journal Articles

No journal articles.

Meeting/Conference Papers


44. Maiden, Donald L.: Aircraft Surface Coatings for Erosion/Corrosion Protection and Excrucence Drag Reduction. Presented at the International Aircraft Maintenance Engineering Exhibition and Conference (AIRMEC '80 USA), April 8-10, 1980, Dallas, Texas. (Avail: AE&M Subject Category 05 RTOP 534-02-13)

Computer Programs

No computer programs.

Tech Briefs

No tech briefs.

Patents

No patents.

Unpublished Research

PUBLICATIONS FOR LARGE SPACE SYSTEMS TECHNOLOGY PROGRAM OFFICE

Formal Reports


Quick-Release Technical Memorandums


Contractor Reports


Journal Articles

No journal articles.

Meeting/Conference Papers


No computer programs.

No tech briefs.

No patents.

No unpublished research.
OFFICE OF DIRECTOR FOR ELECTRONICS
PUBLICATIONS FOR ANALYSIS AND COMPUTATION DIVISION

Formal Reports


Quick-Release Technical Memorandums


58. Parrish, Russell V.: Preliminary Investigation of Motion Requirements for the Simulation of Helicopter Hover Tasks. NASA TM-81801, April 1980, 29 p. (Avail: NTIS Subject Category 05 RTOP 505-43-33)


Contractor Reports


Journal Articles


Meeting/Conference Papers


Computer Programs

No computer programs.

Tech Briefs


Patents


Unpublished Research


PUBLICATIONS FOR FLIGHT DYNAMICS AND CONTROL DIVISION

Formal Reports


92. Miller, G. Kimball, Jr.: Simulating Comparison of a Decoupled Longitudinal Control System and a Velocity-Vector Control Wheel Steering System During Landings in Wind Shear. NASA TP-1734, November 1980, 73 p. (Avail: NTIS Subject Category 08 RTOP 505-34-33)

(Avail: NTIS Subject Category 08 RTOP 505-41-13)

(Avail: STIF Subject Category 05 RTOP 505-43-33)

(Avail: IAC Subject Category 05 RTOP 505-34-33)

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Journal Articles

   (Avail: AIAA Subject Category 63 RTOP 506-19-13)

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Meeting/Conference Papers


Computer Programs

No computer programs.

Tech Briefs


Patents

No patents.

Unpublished Research


PUBLICATIONS FOR FLIGHT ELECTRONICS DIVISION

Formal Reports

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(Avail: NTIS, NASA CP-2168 Subject Category 17 RTOP 506-62-43)

213. Creedon, J. F.; and Ostroff, Aaron J.: Figure Control of Flexible Structures: Optical Surfaces of Thin Deformable Primary Mirrors. Presented at the 19th IEEE Conference on Decision and Control, December 10-12, 1980, Albuquerque, New Mexico.
(Avail: IEEE Subject Category 08 RTOP 505-34-33)

(Avail: AIAA Subject Category 35 RTOP 146-10-06)

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Computer Programs

No computer programs.

Tech Briefs


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PUBLICATIONS FOR INSTRUMENT RESEARCH DIVISION

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Unpublished Research


376. Harward, C. N.; Bair, C.; Hoell, J.; Williams, B. S.; and Williams, J. A.: High Resolution Absorption Coefficients for Dichlorodifluoromethane and the Temperature Dependence of the 6 Q-Branch at 1161 cm\(^{-1}\). Presented at the Ohio State Spectroscopic Conference, June 16-20, 1980, Columbus, Ohio.


PUBLICATIONS FOR TERMINAL CONFIGURED VEHICLE PROGRAM OFFICE

Formal Reports

(Avail: NTIS Subject Category 03 RTOP 534-04-13)

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Journal Articles

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Computer Programs

No computer programs.

Tech Briefs

No tech briefs.

Patents

No patents.

Unpublished Research

PUBLICATIONS FOR OFFICE OF DIRECTOR FOR STRUCTURES

Formal Reports
No formal reports.

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

Contractor Reports
No contractor reports.

Journal Articles
No journal articles.

Meeting/Conference Papers
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Computer Programs
No computer programs.

Tech Briefs
No tech briefs.

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PUBLICATIONS FOR MATERIALS DIVISION

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(Avail: NTIS Subject Category 24 RTOP 534-03-23)

(Avail: NTIS Subject Category 24 RTOP 734-01-03)

(Avail: NTIS Subject Category 24 RTOP 505-33-43)


490. Smith, Jill H.; and Morrissey, John A.: Selection and Validation of a Multiple
Fiber Model. (L-86678A U.S. Army Ballistic Research Laboratory.) NASA
(Avail: NTIS Subject Category 24 RTOP 534-03-23)

491. Staff of Rockwell International Corporation: Development and Demonstration
Manufacturing Processes for Fabricating Graphite/LARC-160 Polyimide Structural
Elements - 7th Quarterly Progress Report. (NAS1-15371 Rockwell International
(Avail: NTIS Subject Category 24 RTOP 524-71-13)

in Wide-Bodied Commercial Transport Aircraft - Sixth Annual Flight Service
Report. (NAS1-11621 Lockheed-California Company.) NASA CR-159231,
(Avail: NTIS Subject Category 24 RTOP 505-33-43)

493. Stumpfel, Charles R.; and Weaver, Calvin E.: Measured Carbon Fiber Exposures
to Malfunction for Civilian Electronic Items. (L-86678A U.S. Army Ballistic
(Avail: NTIS Subject Category 24 RTOP 534-03-23)

494. Sussholz, B.: Evaluation of Micron Size Carbon Fibers Released From Burning
Graphite Composites. (NAS1-15465 TRW Defense and Space Systems Group.)
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495. Trethewey, John D.; and Whiting, John H.: Surveillance Sampling of Carbon
(Avail: NTIS Subject Category 24 RTOP 534-03-23)

496. Whiting, John H.; Peterson, William A.; Sutton, Gary L.; and Magann, Neil G.:
Large-Scale Outdoor Fire-Released Carbon Fiber Tests. (L-92348A U.S. Army
(Avail: NTIS Subject Category 24 RTOP 534-03-23)

Journal Articles

497. Crews, John H., Jr.; and Raju, I. S.: Width Effects on Stresses in Graphite/Epoxy
(Avail: ASTM Subject Category 24 RTOP 506-53-53)

498. Hergenrother, P. M.; and Johnston, N. J.: Status of High-Temperature Laminating
Resins and Adhesives. ACS Symposium Series No. 132: Resins for Aerospace,
(Avail: ACS Subject Category 27 RTOP 505-33-33)


Meeting/Conference Papers


*Army Structures Laboratory, USARTL (AVRADCOM)


*Army Structures Laboratory, USARLT (AVRADCOM)


*Army Structures Laboratory, USARL (AVRACOM)


*Army Structures Laboratory, USARL (AVRADCOM)
Computer Programs


Tech Briefs


*Army Structures Laboratory, USARTL (AVRADCOM)
Patents

(Avail: U.S. Patent & Trademark Office Subject Category 24)

(Avail: U. S. Patent & Trademark Office Subject Category 27)

Unpublished Research


*Army Structures Laboratory, USARTL (AVRADCOM)


PUBLICATIONS FOR ACOUSTICS AND NOISE REDUCTION DIVISION

Formal Reports


Quick-Release Technical Memorandums


(Avail: NTIS Subject Category 45 RTOP 505-35-13)

(Avail: NTIS Subject Category 45 RTOP 505-35-13)

(Avail: NTIS Subject Category 71 RTOP 505-32-03)

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Contractor Reports

(Avail: NTIS Pending Subject Category 71 RTOP 505-32-03)

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Computer Programs
No computer programs.

Tech Briefs


Patents
No patents.

Unpublished Research


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Patents

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Contractor Reports


Journal Articles


Meeting/Conference Papers


Computer Programs


Tech Briefs


Patents

No patents.
Unpublished Research


PUBLICATIONS FOR FLIGHT MECHANICS DIVISION

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Formal Reports


Quick-Release Technical Memorandums

No quick-release technical memorandums.

Contractor Reports


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Patents

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Contractor Reports


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Computer Programs

No computer programs.

Tech Briefs


Patents


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Contractor Reports


Journal Articles


1351. Wakelyn, N. T.; and Gregory, Gerald L.: Comparison of Measured Ozone in South-eastern Virginia With Computer Predictions From a Photochemical Model. Environmental Science and Technology, Volume 14, Number 8, August 1980, p. 1006-1008. (Avail: Subject Category 45 RTOP 146-20-10)


Meeting/Conference Papers


1358. Gregory, Gerald L.; McDougal, David S.; and Wagner, H. Scott: An Air Quality Program Designed to Evaluate Remote Sensors. Presented at the 73rd Annual Meeting of the Air Pollution Control Association, June 22-27, 1980, Montreal, Quebec, Canada. Paper No. 80-44.5 (Avail: APCA Subject Category 45 RTOP 146-20-10)


Computer Programs

No computer programs.

Tech Briefs


Patents


Unpublished Research


1380. Harriss, Robert C.; and Sebacher, Daniel I.: Reassessing the Importance of Wetlands as a Global Source of Tropospheric Methane. Presented at the American Geophysical Union Spring Meeting, May 22-27, 1980, Toronto, Canada.


PUBLICATIONS FOR OFFICE OF DIRECTOR FOR SYSTEMS ENGINEERING AND OPERATIONS

Formal Reports


Quick-Release Technical Memorandums

No quick-release technical memorandums.

Contractor Reports

No contractor reports.

Journal Articles

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Tech Briefs

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Patents

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Unpublished Research


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Tech Briefs


(Avail: NASA Langley Technology Utilization Office Category: Fabrication Technology)

(Avail: NASA Langley Technology Utilization Office Category: Fabrication Technology)

(Avail: NASA Langley Technology Utilization Office Category: Life Sciences)

(Avail: NASA Langley Technology Utilization Office Category: Fabrication Technology)

Patents

(Avail: U.S. Patent & Trademark Office Subject Category 51)

Unpublished Research

No unpublished research.
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Formal Reports

(Avail: NTIS Subject Category 31)

(Avail: NTIS Subject Category 03 RTOP 505-41-13)

(Avail: NTIS Subject Category 03 RTOP 505-41-13)

Quick-Release Technical Memorandums

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Contractor Reports

(Avail: STIF Subject Category 19 RTOP 147-40-01)

(Avail: NTIS Subject Category 31 RTOP 146-10-06)

(Avail: STIF Subject Category 05 RTOP 505-32-03)

Journal Articles

(Avail: AIAA Subject Category 16 RTOP 506-26-13)

(Avail: AIAA Subject Category 18 RTOP 506-26-13)
Meeting/Conference Papers


Computer Programs

No computer programs.

Tech Briefs


Patents

No patents.
PUBLICATIONS FOR RESEARCH FACILITIES ENGINEERING DIVISION

Formal Reports

No formal reports.

Quick-Release Technical Memorandums


Contractor Reports

No contractor reports.

Journal Articles

No journal articles.

Meeting/Conference Papers


Computer Programs

No computer programs.

*Army Structures Laboratory, USARTL (AVRADCOM)

Patents

No patents.

Unpublished Research

No unpublished research.
PUBLICATIONS FOR OPERATIONS SUPPORT DIVISION

Formal Reports
No formal reports.

Quick-Release Technical Memorandums
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Contractor Reports
No contractor reports.

Journal Articles
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Meeting/Conference Papers
No meeting/conference papers.

Computer Programs
No computer programs.

Tech Briefs
   (Avail: NASA Langley Technology Utilization Office Category: Physical Sciences)

Patents
   (Avail: U.S. Patent & Trademark Office Subject Category 35)

   (Avail: U.S. Patent & Trademark Office Subject Category 02)
PUBLICATIONS FOR PLANT ENGINEERING DIVISION

Formal Reports

No formal reports.

Quick-Release Technical Memorandums

No quick-release technical memorandums.

Contractor Reports

No contractor reports.

Journal Articles

No journal articles.

Meeting/Conference Papers


Computer Programs

No computer programs.

Tech Briefs


Patents

Formal Reports

No formal reports.

Quick-Release Technical Memorandums

(Avail: NTIS Subject Category 82)

Contractor Reports

(Avail: STIF Subject Category 52 RTOP 141-20-21)

Journal Articles

(Avail: Morehead State University Subject Category 82)

Meeting/Conference Papers

No meeting/conference papers.

Computer Programs

No computer programs.

Tech Briefs

(Avail: NASA Langley Technology Utilization Office Category: Electronic Systems)
Patents

No patents.

Unpublished Research

PUBLICATIONS FOR ARMY STRUCTURES LABORATORY (AVRADCOM)

Formal Reports

No formal reports.

Quick-Release Technical Memorandums

No quick-release technical memorandums.

Contractor Reports


Journal Articles

No journal articles.

Meeting/Conference Papers

No meeting/conference papers.

Computer Programs

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Tech Briefs

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APPENDIX

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1201 East 38th Street
Indianapolis, IN 46205
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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
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