NASA Technical Memorandum 81950

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

FEBRUARY 1981

NASA
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

NASA
National Aeronautics and Space Administration
Langley Research Center
Hampton, Virginia 23665
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
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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NASA LANGLEY RESEARCH CENTER
Hampton, Virginia

CALENDAR YEAR 1980

PUBLICATIONS FOR OFFICE OF THE DIRECTOR

Formal Reports
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Quick-Release Technical Memorandums
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   (Avail: NTIS Subject Category 34 RTOP 505-31-83)

Contractor Reports
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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

(Avail: NTIS Subject Category 18 RTOP 815-00-00)

(Avail: NTIS Subject Category 18 RTOP 815-00-00)

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Quick-Release Technical Memorandums

No quick-release technical memorandums.

Contractor Reports

(Avail: NTIS Subject Category 61 RTOP 992-16-04)

Journal Articles

No journal articles.

Meeting/Conference Papers

(Avail: ISPA Subject Category 81 RTOP 619-12-01)


Computer Programs

No computer programs.

Tech Briefs


Patents

No patents.

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

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Quick-Release Technical Memorandums

No quick-release technical memorandums.

Contractor Reports

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Journal Articles

No journal articles.

Meeting/Conference Papers

(Avail: Pergamon Press, Advances in Composite Materials Subject Category 24 RTOP 534-03-13)

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

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


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Computer Programs

No computer programs.

Tech Briefs


Patents


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Computer Programs

No computer programs.

Tech Briefs


Patents

No patents.

Unpublished Research


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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)

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Computer Programs

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Tech Briefs


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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.


Formal Reports


Quick-Release Technical Memorandums


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No journal articles.
Meeting/Conference Papers

(Avail: Wansbrough-White & Company, Ltd. Subject Category 03 RTOP 534-04-13)

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Computer Programs

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Tech Briefs

No tech briefs.

Patents

No patents.

Unpublished Research

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

Contractor Reports
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(Avail: NTIS Subject Category 61 RTOP 505-33-43)

*Army Structures Laboratory, USARTL (AVRADCOM)

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(Avail: NTIS Subject Category 24 RTOP 506-53-23)

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

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Computer Programs

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Tech Briefs


Patents

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Unpublished Research


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Patents

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(Avail: STIF, NASA CP-2162, Vol. I Subject Category 02 RTOP 505-43-23)

(Avail: NTIS Subject Category 02 RTOP 505-31-13)

(Avail: AIAA Subject Category 09 RTOP 505-31-53)
Computer Programs


Tech Briefs


Patents

Unpublished Research


OFFICE OF DIRECTOR FOR SPACE
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Quick-Release Technical Memorandums

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Contractor Reports


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(Avail: AMS Subject Category 46 RTOP 198-30-02)

(Avail: AGU Subject Category 46 RTOP 750-03-03)

(Avail: Journal Roy. Soc. Lon. Subject Category 46 RTOP 665-10-40)

(Avail: AMS Subject Category 47 RTOP 146-10-06)

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Meeting/Conference Papers


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(Avail: University of Maryland (Proceedings) Subject Category 46 RTOP 198-30-02)

(Avail: NCAR Subject Category 47 RTOP 147-30-01)

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(Avail: Colorado State University Subject Category 46 RTOP 620-14-00)

(Avail: NCAR Subject Category 46 RTOP 642-14-03)

(Avail: Colorado State University Subject Category 47 RTOP 665-10-40)

(Avail: OSA Technical Digest Subject Category 46 RTOP 620-14-00)
(Avail: Colorado State University Subject Category 46 RTOP 620-14-00)

(Avail: Pergamon Press Ltd., Publication in Space Research Pending Subject Category 46 RTOP 642-14-03)

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

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(Avail: Colorado State University Subject Category 47 RTOP 619-12-20)

(Avail: Colorado State University Subject Category 47 RTOP 619-12-20)

(Avail: NCAR Subject Category 47 RTOP 146-60-01)
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Tech Briefs

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Patents

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Computer Programs

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(Avail: American Meteorological Society Subject Category 48 RTOP 989-15-20)

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(Avail: AGU Subject Category 45 RTOP 146-40-15)

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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.


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No contractor reports.

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No journal articles.

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No computer programs.

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No tech briefs.

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Formal Reports

(Avail: NTIS Subject Category 26 RTOP 992-18-00)

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

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

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No contractor reports.

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No journal articles.

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*Army Structures Laboratory, USARTL (AVRADCOM)
Tech Briefs

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Patents

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No unpublished research.
PUBLICATIONS FOR OPERATIONS SUPPORT DIVISION

Formal Reports
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No contractor reports.

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No quick-release technical memorandums.

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No computer programs.

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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

No computer programs.

Tech Briefs

No tech briefs.
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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
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2500 Central Avenue, SE
Albuquerque, NM 87131
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