

## General Disclaimer

### One or more of the Following Statements may affect this Document

- This document has been reproduced from the best copy furnished by the organizational source. It is being released in the interest of making available as much information as possible.
- This document may contain data, which exceeds the sheet parameters. It was furnished in this condition by the organizational source and is the best copy available.
- This document may contain tone-on-tone or color graphs, charts and/or pictures, which have been reproduced in black and white.
- This document is paginated as submitted by the original source.
- Portions of this document are not fully legible due to the historical nature of some of the material. However, it is the best reproduction available from the original submission.

**NASA TECHNICAL  
MEMORANDUM**

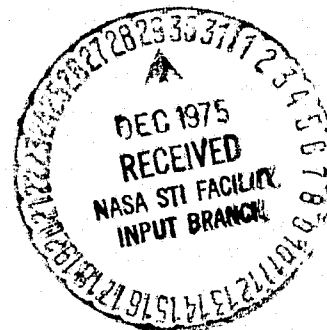
**NASA TM X-62,492**

**NASA TM X- 62 492**

**AMES RESEACH CENTER PUBLICATIONS  
JULY 1971 THROUGH DECEMBER 1973**

**Ames Research Center  
Moffett Field, Calif. 94035**

**October 1975**



**(NASA-TM-X-62492) AMES RESEACH CENTER  
PUBLICATIONS, JULY 1971 THROUGH DECEMBER  
1973 (NASA) 295 p HC \$9.25 CSCI 05B**

**N76-14015**

**Unclas  
G3/99 05379**

|   |  |   |
|---|--|---|
| 1. Report No.<br>NASA TM-X 62,492   | 2. Government Accession No.  | 3. Recipient's Catalog No.                                    |
| 4. Title and Subtitle<br>AMES RESEARCH CENTER PUBLICATIONS<br>July 1971 through December 1973   | 5. Report Date   | 6. Performing Organization Code                               |
|   | 8. Performing Organization Report No.<br>A-6304  | 10. Work Unit No.   |
| 7. Author(s)  | 11. Contract or Grant No.  | 13. Type of Report and Period Covered<br>Technical Memorandum |
|   | 9. Performing Organization Name and Address<br>Ames Research Center<br>Moffett Field, Calif. 94035 | 14. Sponsoring Agency Code                                    |
| 12. Sponsoring Agency Name and Address<br>National Aeronautics and Space Administration<br>Washington, D. C. 20546  | 15. Supplementary Notes  |   |
| 16. Abstract<br><br>Bibliography of the publications of Ames Research Center authors and contractors which appeared as formal NASA publications, journal articles, books, chapters of books, patents and contractor reports. Years covered are July 1971 through December 1973. |  |   |
| 17. Key Words (Suggested by Author(s))<br>Bibliographies<br>NASA programs<br>Research projects  | 18. Distribution Statement<br>Unclassified - Unlimited<br><br>STAR Category - 99                   |   |
| 19. Security Classif. (of this report)<br>Unclassified  | 20. Security Classif. (of this page)<br>Unclassified   | 21. No. of Pages<br>294                                       |
|   |  | 22. Price*<br>\$8.75  |

\*For sale by the National Technical Information Service, Springfield, Virginia 22151

## FOREWORD

This is a bibliography of Ames Research Center publications resulting from projects and studies that contributed to the aerospace literature for the period July 1971 through December 1973. *Ames Research Publications* continues the earlier *Contributions of Ames Research Scientists to the Aerospace Literature*, which covered fiscal years 1969, 1970, and 1971.

The document is divided into two sections: Section I, unlimited, publicly available published works; Section II, limited publications. Each section has its own author index. Publications are listed by directorate, division, type of publication, and author. Each NASA report is identified by a technical report number and by an accession number so that most items can be ordered using the information provided.

Additional information may be obtained by referring to NASA's *Scientific and Technical Aerospace Reports* (STAR), *Limited Scientific and Technical Aerospace Reports* (L-STAR), and *International Aerospace Abstracts* (IAA). The NASA unlimited reports are available in either hard copy or microfiche through the National Technical Information Service (NTIS), Springfield, VA 22151, or through the Government Printing Office (GPO), Washington, D.C. 20402. Patents are available through the Commissioner of Patents, U.S. Patent Office Washington, D.C. 20231.

Betty R. Sherwood  
Compiler

TABLE OF CONTENTS

SECTION I - PUBLICATIONS

| ORGANIZATION   | Page |
|--|------|
| Office of the Director . . . . .                               | 1    |
| Office of the Deputy Director . . . . .                        | 3    |
| Administration Directorate                                     |      |
| Technical Information Division. . . . .                        | 4    |
| Aeronautics and Flight Systems Directorate . . . . .           | 5    |
| Aeronautics Division. . . . .                                  | 6    |
| Flight Systems Research Division. . . . .                      | 20   |
| Instrumentation Division. . . . .                              | 45   |
| Quiet Propulsive - Lift Aircraft Technology Office. . . . .    | 46   |
| Simulation Sciences Division. . . . .                          | 47   |
| V/STOL Projects Office. . . . .                                | 49   |
| Astronautics Directorate . . . . .                             | 55   |
| Chemical Research Projects Office . . . . .                    | 58   |
| Space Science Division. . . . .                                | 63   |
| Thermo- and Gas-Dynamics Division . . . . .                    | 92   |
| Vehicle Environment Division. . . . .                          | 117  |
| Development Directorate. . . . .                               | 124  |
| Advanced Space Projects Office. . . . .                        | 125  |
| Flight Project Development Division . . . . .                  | 126  |
| Project Bio-Satellite . . . . .                                | 133  |
| Project Pioneer . . . . .                                      | 134  |
| Reliability and Quality Assurance Office. . . . .              | 137  |
| Systems Engineering Division. . . . .                          | 138  |
| Life Sciences Directorate. . . . .                             | 141  |
| Biomedical Research Division. . . . .                          | 142  |
| Biotechnology Division. . . . .                                | 150  |
| Environmental Biology Division. . . . .                        | 170  |
| Exobiology Division . . . . .                                  | 174  |
| Planetary Biology Division. . . . .                            | 182  |
| Research Support Directorate . . . . .                         | 188  |
| Computation Division. . . . .                                  | 189  |
| Institute for Advanced Computation. . . . .                    | 190  |
| Research Facilities and Instrumentation Division. . . . .      | 191  |
| Systems Studies Division . . . . .                             | 196  |
| Army Air Mobility Research and Development Laboratory. . . . . | 208  |
| Author Index . . . . .   | 217  |

SECTION II - LIMITED PUBLICATIONS

|  |   |
|--|---|
| Administration Directorate                 |   |
| Technical Information Division. . . . .    | 1 |
| Aeronautics and Flight Systems Directorate |   |
| Aeronautics Division. . . . .              | 2 |
| Flight Systems Research Division. . . . .  | 8 |

|  |    |
|--|----|
| Quiet Propulsive Lift Aircraft Technology Office. . . . .      | 10 |
| Simulation Sciences Division. . . . .                          | 11 |
| V/STOL Projects Office. . . . .                                | 12 |
| <b>Astronautics Directorate</b>                                |    |
| Space Science Division. . . . .                                | 15 |
| Thermo- and Gas-Dynamics Division . . . . .                    | 16 |
| Vehicle Environment Division. . . . .                          | 18 |
| <b>Development Directorate. . . . .</b>                        | 19 |
| Advance Space Projects Office . . . . .                        | 20 |
| Flight Project Development Division . . . . .                  | 21 |
| Project Pioneer . . . . .                                      | 22 |
| Reliability and Quality Assurance Office. . . . .              | 23 |
| Systems Engineering Division. . . . .                          | 24 |
| <b>Life Sciences Directorate</b>                               |    |
| Biomedical Research Division. . . . .                          | 25 |
| Biotechnology Division. . . . .                                | 26 |
| <b>Research Support Directorate . . . . .</b>                  | 27 |
| Research Facilities and Instrumentation Division. . . . .      | 28 |
| Technical Services Division . . . . .                          | 29 |
| Systems Studies Division . . . . .                             | 30 |
| Army Air Mobility Research and Development Laboratory. . . . . | 33 |
| Author Index . . . . .   | 34 |

**SECTION I**  
**PUBLICATIONS**

July 1971 through December 1973

OFFICE OF THE DIRECTOR

FORMAL REPORTS

1. Anon.  
Final Environmental Impact Statement for Ames Research Center. July 1971.  
NASA TM-X-67669 N72-21286
2. Hypogравic and Hypodynamic Environments: Proceedings of a Conference Held at French Lick, Ind., June 16-18, 1969. Proceedings. Murray, R. H.; and McCally, M., editors. Washington, NASA, 1971.  
NASA SP-269 N71-33251
3. Jones, J. L.  
Transonic Testing in Existing Wind Tunnels. In Advisory Group for Aerospace Research and Development, Paris. Facilities and Techniques for Aerodynamic Testing at Transonic Speeds and High Reynolds Number. Presented at the Fluid Dynamics Panel Specialists Meeting, Goettingen, 26-28 Apr. 1971. Aug. 1971. (AGARD-CP-83-71).  
NASA TM-X-67415 N72-11872
4. Jones, R. T.  
Properties of Oblique-Wing/Body Combinations for Low Supersonic Speeds. In Vehicle Technology for Civil Aviation: The Seventies and Beyond, Langley Research Center, Langley Station, Va., Nov. 2-4, 1971. Conference Proceedings, 1971, p. 389-407.  
NASA SP-292 N72-13018

JOURNAL ARTICLES, MEETING PAPERS, BOOKS AND CHAPTERS OF BOOKS

5. Bambynek, W.; Crasemann, B.; Fink, R. W.; Freund, H. U.; Mark, H.; Swift, C. D.; Price, R. E.; and Rao, P. V.  
X-Ray Fluorescence Yields, Auger, and Coster-Kronig Transition Probabilities. Reviews of Modern Physics, vol. 44, Oct. 1972, p. 716-813.
6. Compton, D. L.  
Taylor Instability in the Shock Layer on a Jovian Atmosphere Entry Probe. Journal of Spacecraft and Rockets, vol. 9, Sept. 1972, pp. 717-718.
7. Compton, D. L.  
Use of an Infrared-Imaging Camera to Obtain Convective Heating Distributions. AIAA Journal, vol. 10, Aug. 1972, p.1130-1132.



8. Harper, C. W.; and Mark, H.  
S.T.O.L., V.T.O.L., and V./S.T.O.L. - Where do They Fit In.  
Technology Review, vol. 74, May 1972, p. 22-30.
9. Jones, R. T.  
New Design Goals and a New Shape for the SST. *Aeronautics and Aeronautics*, vol. 10, Dec. 1972, p. 66-70.
10. Jones, R. T.  
Reduction of Wave Drag by Antisymmetric Arrangement of Wings and Bodies. *AIAA Journal*, vol. 10, Feb. 1972, p. 171-176.
11. Mark, H.  
Future space exploration. *National Defense*, vol. 58, Sept.-Oct. 1973.  
p. 120-123.
12. Mark H.  
Review of Fluorescence Yields and Auger Electron Emission. In  
International Conference on the Physics of Electronic and Atomic  
Collisions, 7th, Amsterdam, 1971. *The Physics of Electronic and Atomic Collisions; Invited Papers and Progress Reports*. Govers, T. R.;  
and de Heer, F. J., Editors. Amsterdam, North-Holland Publ. Co.,  
1972, p. 154-168.
13. Mark, H.  
The Scientific Climate in San Francisco. *Science*, vol. 182, 26 Oct.  
1973, p. 399-400.
14. Seiff, A.; Reese, D. E.; Sommer, S. C.; Kirk, D. B.; Whiting, E. E.;  
and Niemann, H. B.  
PAET, an Entry Probe Experiment in the Earth's Atmosphere. *Icarus*,  
vol. 18, April 1973, p. 525-563.

#### PATENTS

15. Jones, R. T.  
Dual-Fuselage Aircraft Having Yawable Wing and Horizontal Stabilizer.  
June 5, 1973.  
US-PATENT-3,737,121
16. Jones, R. T.  
Single Wing Supersonic Aircraft. Jan. 1, 1973.  
US-PATENT-APPL-SN-321180

OFFICE OF THE DEPUTY DIRECTOR

FORMAL REPORTS

17. Hewitt, J. E.  
Radiation Exposures During the Biosatellite II Flight. In The Experiments of Biosatellite II. Saunders, J. F., Editor. 1971, p. 333-346.  
NASA SP-204 N72-20065
  
18. Syvertson, C. A.; and Mulholland, D. R.  
Aviation's Role in Earth Resources Surveys. In American Society of Mechanical Engineers Aviation and Space Conference, Sept. 11-13, 1972. Paper.  
NASA TM-X-62436

JOURNAL ARTICLES, MEETING PAPERS, BOOKS AND CHAPTERS OF BOOKS

19. Gilbert, R. A.; Jackson, R. P.; Bisplinghoff, R. P.; Syvertson, C. A.; and Wilson, T. A.  
Industry Relations with Government. *Astronautics and Aeronautics*, vol. 9, Nov. 1971, p. 65-72.
  
20. Hewitt, J. E.; Schaefer, H. J.; and Sullivan, J. J.  
Radiation Exposure During the Biosatellite III Primate Flight. *Health Physics*, vol. 23, Oct. 1972, p. 461-468.
  
21. Syvertson, C. A.  
The CARD Study - What is its Impact? *American Inst. of Aeronautics and Astronautics. Annual Meeting and Technical Display, 8th, Washington, D.C., Oct. 25-28, 1971. AIAA Paper 71-1024.*
  
22. Syvertson, C. A.  
Civil Aviation Research and Development (CARD) Policy Study. In NEREM 71; Northeast Electronics Research and Engineering Meeting, Boston, Mass., Nov. 2-5, 1971. Record. Part 1. Newton, Mass., Institute of Electrical and Electronics Engineers, Inc., 1971. p. 58-60.

TECHNICAL INFORMATION DIVISION

JOURNAL ARTICLES, MEETING PAPERS, BOOKS AND CHAPTERS OF BOOKS

23. West, M. W.; Gill, E. D.; and Sherwood, B. R.  
Chemical Evolution and the Origin of Life - Bibliography Supplement  
1971. Space Life Sciences, vol. 4, April 1973, p. 309-328.

AERONAUTICS AND FLIGHT SYSTEMS DIRECTORATE

FORMAL REPORTS

24. Cook, A. M.; and Aiken, T. N.  
Low Speed Aerodynamic Characteristics of a Large-Scale STOL Transport Model with an Augmented Jet Flap. Mar. 1971.  
NASA TM-X-62017 N71-26183
25. Roberts, L.  
Short-Haul Transportation in the 1980's. In NASA. Ames Research Center, Moffett Field, Calif. STOL Technology; Conference Held at Moffett Field, 17-19 Oct. 1972. p. 1-8.  
NASA SP-320 N73-32935
26. Showman, R. D.; Wahrend, W. R., Jr.; and White, K. C.  
A Preliminary Evaluation of Navigation and Guidance Concepts for the Space Shuttle Orbiter from the End of Reentry to Touchdown. In Space Shuttle Integrated Electronics Conference, Manned Spacecraft Center, Houston, Tex., 11-13 May 1971. Proceedings, vol. 1, 1971, p. 195-220.  
NASA TM-X-58063 N71-33060

NASA CONTRACTOR REPORTS

27. Cockayne, W.; and Rusnak, W.  
Study of Automatic Flare and Decrab Guidance and Control System for the Space Shuttle. Final Report. (BAC-6272-933010, Bell Aerospace Co., Buffalo, N.Y.; NAS2-6077.) July 1971.  
NASA CR-114436 N72-25599

JOURNAL ARTICLES, MEETING PAPERS, BOOKS AND CHAPTERS OF BOOKS

28. Roberts, L.  
The Promise of Aeronautics. Astronautics and Aeronautics, vol. 9, May 1971, p. 24-31.

AERONAUTICS DIVISION

FORMAL REPORTS

29. Barlow, A. V.; and Vanderplaats, G. N.  
TIDY, a Complete Code for Renumbering and Editing FORTRAN Source Programs. User's Manual for IBM 360/67. Aug. 1973.  
NASA TM-X-62286 N73-31128
30. Boltz, F. W.; and Haines, R. F.  
Irradiation Effects on Manual Sighting Accuracy of a Space-Flight-Rated Sextant Using Simulated Lunar and Stellar Targets. Sept. 1971.  
NASA TN-D-6507 N71-35774
31. Cahill, J. F.; Treon, S. L.; and Hofstetter, W. R.  
Feasibility of Testing a Large-Chord, Swept-Panel Model to Determine Wing Shock Location at Flight Reynolds Number. Aug. 1971. In Advisory Group for Aerospace Research and Development, Paris. Facilities and Techniques for Aerodynamic Testing at Transonic Speeds and High Reynolds Number. Presented at the Fluid Dynamics Panel Specialists Meeting, Goettingen, 26-28 Apr. 1971. Aug. 1971. (AGARD-CP-83-71)  
NASA TM-X-67414 N72-11870
32. Chyu, W. J.; and Au-Yang, M. K.  
Random Response of Rectangular Panels to the Pressure Field Beneath a Turbulent Boundary Layer in Subsonic Flows. Oct. 1972.  
NASA TN-D-6970 N73-12934
33. Coe, C. F.; and Chyu, W. J.  
Pressure-Fluctuation Inputs and Response of Panels Underlying Attached and Separated Supersonic Turbulent Boundary Layers. In Advisory Group for Aerospace Research and Development, Paris. Symposium on Acoustic Fatigue. Papers presented at the 35th Meeting of the Structures and Materials Panel, Toulouse, 26-27 Sept. 1972. May 1973. AGARD-CP-113. N73-29910
34. Davis, S. S.  
Investigation of Sonic Boom Generated by Thin, Nonlifting, Rectangular Wings. Dec. 1971.  
NASA TN-D-6619 N72-11949
35. Dods, J. B., Jr.; and Hanly, R. D.  
In-Flight Aeroacoustic Environments on Prospective Space Shuttle Vehicles. In NASA Space Shuttle Technology Conference: Dynamics and Aeroelasticity; Structures and Materials, San Antonio, Tex., Apr. 12-14, 1972. Progress Report. July 1972, p. 71-96.  
NASA TM-X-2570 N72-30869

36. Dods, J. B., Jr.; Hanly, R. D.; and Efting, J. H.  
Overall Fluctuating Pressure Levels on Prospective Space Shuttle  
Launch Configurations at Mach Numbers from 0.8 to 2.2. Apr. 1973.  
NASA TM-X-62280 N73-26882
  
37. Erickson, L. L.  
Supersonic Flutter of Sandwich Panels: Effects of Face Sheet Bending  
Stiffness, Rotary Inertia, and Orthotropic Core Shear Stiffnesses.  
July 1971.  
NASA TN-D-6427 N71-32373
  
38. Garcia, F., Jr.; Hicks, R. M.; and Mendoza, J. P.  
A Wind Tunnel Flight Correlation of Apollo 16 Sonic Boom. Feb. 1973.  
NASA TM-X-62073 N73-21073
  
39. Gnos, A. V.; Watson, E. C.; Seebaugh, W. R.; Sanator, R. J.; and  
DeCarlo, J. P.  
Investigation of Flow Fields Within Large Scale Hypersonic Inlet Models.  
Apr. 1973.  
NASA TN-D-7150 N73-21905
  
40. Graham, L. A.; Jones, R. T.; and Boltz, F. W.  
An Experimental Investigation of an Oblique-Wing and Body Combination  
at Mach Numbers Between 0.60 and 1.40. Dec. 1972.  
NASA TM-X-62207 N73-32927
  
41. Graham, L. A.; Jones, R. T.; and Boltz, F. W.  
An Experimental Investigation of Three Oblique-Wing and Body  
Combinations at Mach Numbers Between 0.60 and 1.40. Apr. 1973.  
NASA TM-X-62256 N73-32926
  
42. Graham, L. A.; and Hunton, L. W.  
A Study of Internal Drag of Small-Scale Ducts at Mach Number 4.  
Mar. 1972.  
NASA TM-X-62143 N72-20272
  
43. Graham, L. A.; Jones, R. T.; and Summers, J. L.  
Wind Tunnel Tests of an F-8 Airplane Model Equipped with an Oblique  
Wing. June 1973.  
NASA TM-X-62273 N73-32974
  
44. Gregory, T. J.  
Computerized Preliminary Design at the Early Stages of Vehicle  
Definition. Sept. 1973.  
NASA TM-X-62303 N73-30943
  
45. Guist, L. R.  
Buckling Load of Thin Circular Cylindrical Shells Formed by Plastic  
Expansion. Apr. 1971.  
NASA TN-D-6322 N71-23733

46. Hicks, R. M.; and Mendoza, J. P.  
Oblique-Wing Sonic Boom. Feb. 1973.  
NASA TM-X-62247 N73-21922
  
47. Hicks, R. M.; and Mendoza, J. P.  
Pressure Signatures for a .00053 Scale Model of the Saturn 5-Apollo  
Launch Vehicle with Simulated Exhaust Plumes. July 1973.  
NASA TM-X-62129 N73-30830
  
48. Hicks, R. M.; Mendoza, J. P.; and Thomas, C. L.  
Pressure Signatures for the Apollo Command Module and the Saturn 5  
Launch Vehicle with a Discussion of Strong Shock Extrapolation Proce-  
dures. Apr. 1972.  
NASA TM-X-62117 N73-13904
  
49. Hicks, R. M.; Mendoza, J. P.; and Garcia, F., Jr.  
A Wind-Tunnel Flight Correlation of Apollo 15 Sonic Boom. Jan. 1972.  
NASA TM-X-62111 N73-13016
  
50. Hopkins, E. J.  
Charts for Predicting Turbulent Skin Friction From the Van Driest  
Method (II). Oct. 1972.  
NASA TN-D-6945 N73-10315
  
51. Hunton, L. W.; Hicks, R. M.; and Mendoza, J. P.  
Some Effects of Wing Planform on Sonic Boom. Jan. 1973.  
NASA TN-D-7160 N73-15709
  
52. Jorgensen, L. H.; and Brownson, J. J.  
Effects of Reynolds Number and Body Corner Radius on Aerodynamic  
Characteristics of a Space Shuttle-Type Vehicle at Subsonic Mach  
Numbers. Jan. 1972.  
NASA TN-D-6615 N72-12980
  
53. Jorgensen, L. H.  
A Method for Estimating Static Aerodynamic Characteristics for Slender  
Bodies of Circular and Noncircular Cross Section Alone and With  
Lifting Surfaces at Angles of Attack From 0° to 90°. Apr. 1973.  
NASA TN-D-7228 N73-20998
  
54. Jorgensen, L. H.  
Prediction of Static Aerodynamic Characteristics for Space-Shuttle-Like  
and Other Bodies at Angles of Attack from 0° to 180°. Jan. 1973.  
NASA TN-D-6996 N73-14988
  
55. Keener, E. R.; and Hopkins, E. J.  
Accuracy of Pitot-Pressure Rakes for Turbulent Boundary-Layer  
Measurements in Supersonic Flow. Mar. 1971.  
NASA TN-D-6229 N71-18427

56. Keener, E. R.; and Hopkins, E. J.  
Turbulent Boundary-Layer Velocity Profiles on a Nonadiabatic Flat  
Plate at Mach Number 6.5. Aug. 1972.  
NASA TN-D-6907  
N72-29233
57. Keener, E. R.; and Brownson, J. J.  
Wind-Tunnel Investigation of the Aerodynamic Characteristics of the  
M2-F2 Lifting-Body Entry Configuration at Transonic and Supersonic  
Mach Numbers. Apr. 1972.  
NASA TM-X-2511  
N72-21005
58. King, L. S.  
Investigation, at Inlet Locations, of Fuselage Flow Fields at Transonic  
and Supersonic Speeds. Aug. 1973.  
NASA TN-D-7364  
N73-31929
59. Kruse, R. L.  
Comparison of the Aerodynamic Characteristics of an Ablating and  
Nonablating Blunted Conical Body. Mar. 1973.  
NASA TN-D-7196  
N73-18002
60. Latham, E. A.; Sorensen, N. E.; and Smeltzer, D. B.  
Investigation of a Mixed Compression Axisymmetric Inlet at Mach  
Number 5.3. Jan. 1972.  
NASA TN-D-6647  
N72-14988
61. Mendoza, J. P.; and Hicks, R. M.  
Further Studies of the Extrapolation of Near-Field Overpressure Data.  
March, 1971.  
NASA TM-X-2219  
N71-18559
62. Mendoza, J. P.; and Hicks, R. M.  
Wind Tunnel Pressure Signatures for a .016 Scale Model of the Apollo  
Command Module. July 1971.  
NASA TM-X-62047  
N73-13905
63. Muhlstein, L., Jr.  
Assessment of Potential Buffet Problems on the Space Shuttle Vehicle.  
In NASA Space Shuttle Technology Conference: Dynamics and Aeroelas-  
ticity; Structures and Materials, San Antonio, Tex., Apr. 12-14, 1972.  
Progress Report. July 1972. p. 25-43.  
NASA TM-X-2576  
N72-30867
64. Muhlstein, L., Jr.; and Beranek, R. G.  
Experimental Investigation of the Influence of the Turbulent Boundary  
Layer on the Pressure Distribution Over a Rigid Two-Dimensional Wavy  
Wall. Aug. 1971  
NASA TN-D-6477  
N71-33311



65. Nelms, W. P., Jr.; and Thomas, C. L.  
Aerodynamic Characteristics of an All-Body Hypersonic Aircraft Configuration at Mach Numbers from 0.65 to 10.6. Nov. 1971.  
NASA TN-D-6577 N72-10045
66. Nelms, W. P., Jr.  
Effects of Body Shape on the Aerodynamic Characteristics of an All-Body Hypersonic Aircraft Configuration at Mach Numbers from 0.65 to 10.6. May 1972.  
NASA TN-D-6821 N72-23996
67. Peterson, V. L.; Katzen, E. D.; Axelson, J. A.; Brownson, J. J.; Ciffone, D. L.; Cleary, J. W.; Intrieri, P. F.; Malcolm, G. N.; and Mellenthin, J. A.  
Static and Dynamic Aerodynamics of Space Shuttle Vehicles. In NASA Space Shuttle Technology Conference, Langley Station, Va., Mar. 2-4, 1971. Vol. 1. Aerothermodynamics, Configurations and Flight Mechanics. April 1971, p. 311-373.  
NASA TM-X-2272 N71-26062
68. Rose, W. C.  
The Behavior of a Compressible Turbulent Boundary Layer in a Shock-Wave-Induced Adverse Pressure Gradient. Mar. 1973.  
NASA TN-D-7092 N73-21280
69. Smeltzer, D. B.; and Sorensen, N. E.  
Analytic and Experimental Performance of Two Isentropic Mixed Compression Axisymmetric Inlets at Mach Numbers 0.8 to 2.65. June 1973.  
NASA TN-D-7320 N73-25817
70. Smeltzer, D. B.; and Sorensen, N. E.  
Tests of a Mixed Compression Axisymmetric Inlet with Large Transonic Mass Flow at Mach Numbers 0.6 to 2.65. Dec. 1972.  
NASA TN-D-6971 N73-13777
71. Stivers, L. S., Jr.  
Calculated Pressure Distributions and Components of Total-Drag Coefficients for 18 Constant-Volume, Slender Bodies of Revolution at Zero Incidence for Mach Numbers from 2.0 to 12.0, with Experimental Aerodynamic Characteristics for Three of the Bodies. Oct. 1971.  
NASA TN-D-6536 N71-36416
72. Thomas, C. L.  
Extrapolation of Sonic Boom Pressure Signatures by the Waveform Parameter Method. June 1972.  
NASA TN-D-6832 N72-26004

73. Treon, S. L.; Hofstetter, W. R.; and Abbott, F. T., Jr.  
On the Use of Freon-12 for Increasing Reynolds Number in Wind-Tunnel Testing of Three-Dimensional Aircraft Models at Subcritical and Supercritical Mach Numbers. In Advisory Group for Aerospace Research and Development, Paris. Facilities and Techniques for Aerodynamic Testing at Transonic Speeds and High Reynolds Number. Presented at the Fluid Dynamics Panel Specialists Meeting, Goettingen, 26-28 Apr. 1971. Aug. 1971. AGARD-CP-83-71, p. 27-1 - 27-8.  
NASA TM-X-67417  
N72-11879
74. Vanderplaats, G. N.  
CONMIN - A FORTRAN Program for Constrained Function Minimization User's Manual. Aug. 1973.  
NASA TM-X-62282  
N73-26619
75. Wong, N. D.; and Anderson, W. E.  
Experimental Investigation of a Large-Scale, Two-Dimensional, Mixed-Compression Inlet System: Internal Performance and Drag at Transonic Conditions,  $M_{\infty} = 0.6$  to 1.28. Oct. 1973.  
NASA TN-D-7445  
N73-31928
76. Wong, N. D.; and Anderson, W. E.  
Experimental Investigation of a Large-Scale, Two-Dimensional, Mixed-Compression Inlet System: Performance at Supersonic Conditions,  $M_{\infty} = 1.55$  to 3.2. June 1971.  
NASA TN-D-6392  
N71-26985
77. Woodruff, J. R.; and Chisel, D. M.  
Test Stand for Precise Measurement of Impulse and Thrust Vector of Small Attitude Control Jets. Aug. 1973.  
NASA TN-D-7402  
N73-31762

#### NASA CONTRACTOR REPORTS

78. Bhat, W. V.; and Wilby, J. F.  
An Evaluation of Random Analysis Methods for the Determination of Panel Damping. (Boeing Co., Seattle, Wash.; NAS2-6285.)  
NASA CR-114423  
N72-18909
79. Cole, H. A., Jr.  
On-Line Failure Detection and Damping Measurement of Aerospace Structures by Random Decrement Signatures. Mar. 1973.  
NASA CR-2205  
N73-18929
80. Dwyer, H. A.; Doss, E. D.; and Goldman, A. L.  
A Computer Program for the Calculation of Laminar and Turbulent Boundary Layer Flows. (California Univ., Davis; NAS2-6362.) 1972.  
NASA CR-114366  
N72-28285

81. Iyenger, S.  
Experimental Damping-In-Pitch of Two Slender Cones at Mach 2 and Incidences up to 30°. (LTR-UA-19, National Aeronautical Establishment, Ottawa, Can.; NASw-1947.) Jan. 1972.  
NASA CR-114483 N72-28993
82. Koncsek, J. L.; and Syberg, J.  
Transonic and Supersonic Test of a Mach 2.65 Mixed-Compression Axisymmetric Intake. Mar. 1972.  
NASA CR-1977 N72-18786
83. Kulfan, R. M.; Neumann, F. D.; Nisbet, J. W.; Mulally, A. R.; Murakami, J. K.; Noble, E. C.; McBarron, J. P.; Stalter, J. L.; Gimmestad, D. W.; and Sussman, M. B.  
High Transonic Speed Transport Aircraft Study. Final Report. (Boeing Commercial Airplane Co., Seattle, Wash.; NAS2-7031.) Sept. 1973.  
NASA CR-114658 N74-17750
84. Magnus, R.; and Yoshihara, H.  
Steady Inviscid Transonic Flows Over Planar Airfoils - A Search for a Simplified Procedure. Jan. 1973.  
NASA CR-2186 N73-14989
85. Melick, H. C., Jr.  
Analysis of Inlet Flow Distortion and Turbulence Effects on Compressor Stability. (TR-2-57110/3R-3071, LTV Aerospace Corp., Dallas, Tex.; NAS2-6901.) Mar. 31, 1973.  
NASA CR-114577 N73-21693
86. Orlik-Rückemann, K. J.; LaBerge, J. G.; and Hanff, E. S.  
Supersonic Experiments on Dynamic Cross-Derivatives Due to Pitching and Yawing of Aircraft-Like Vehicles. (LTR-UA-24, National Research Council of Canada, Ottawa; NASw-2369.) Aug. 1973.  
NASA CR-114663 N73-30944
87. Orlik-Rückemann, K. J.  
Survey of Needs and Capabilities for Wind Tunnel Testing of Dynamic Stability of Aircraft at High Angles of Attack. (National Aeronautical Establishment, Ottawa, Can.; NAS2-7279.) 1973.  
NASA CR-114583 N73-22201
88. Rao, G. V. R.; Chu, W. T.; and Digumarthi, R. V.  
Analytical Lift Fan Noise Study. Interim Report. (Rao (G.V.R.) and Associates, Sherman Oaks, Calif.; NAS2-6401.) July 13, 1973.  
NASA CR-114576 N73-30952
89. Smith, K. W.; and DeCoursin, D. G.  
Development of a High Temperature Heater Using an Yttria Stabilized Zirconia Cored Brick Matrix. (FLUIDYNE-0456, Fluidyne Engineering Corp., Minneapolis, Minn.; NAS2-2691.) Oct. 1971.  
NASA CR-114308 N72-17954

90. Stahara, S. S.; and Spreiter, J. R.  
 Calculative Techniques for Transonic Flows About Certain Classes of  
 Wing Body Combinations. Aug. 1972.  
 NASA CR-2103 N72-28994
91. Stahara, S. S.; and Spreiter, J. R.  
 Calculative Techniques for Transonic Flows About Certain Classes of  
 Wing-Body Combinations. Phase 2. Dec. 1972.  
 NASA CR-2157 N73-11999
92. Syberg, J.; and Hickcox, T. F.  
 Design of a Bleed System for a Mach 3.5 Inlet. Jan. 1973.  
 NASA CR-2187 N73-15821
93. Walitt, L.; and Trulio, J. G.  
 A Numerical Method for Computing Three-Dimensional Viscous Supersonic  
 Flow Fields About Slender Bodies. Nov. 1971.  
 NASA CR-1963 N72-12215
94. Wykes, J. H.; and Lawrence, R. E.  
 Estimated Performance and Stability and Control Data for Correlation  
 with XB-70-1 Flight Test Data. (North American Rockwell Corp.,  
 Los Angeles, Calif.; NAS2-6037.)  
 NASA CR-114335 N71-34001

JOURNAL ARTICLES, MEETING PAPERS, BOOKS AND CHAPTERS OF BOOKS

95. AIAA Atmospheric Flight Mechanics Conference, 2d, Palo Alto, Calif.,  
 1972.  
 Informal papers. Peterson, V. L., Curry, W. H. and Malcolm, G. N.,  
 Chairmen. Moffett Field, Calif., NASA Ames Research Center, 1972.
96. Bar-Nun, A.; and Tauber, M. E.  
 (Thunder): Shock waves in prebiological organic synthesis. Space Life  
 Sciences, vol. 3, June 1972, p. 254-259.
97. Bencze, D. P.; and Sorensen, N. E.  
 A Comparative Study of Three Axisymmetric Inlets for a Hypersonic Cruise  
 Mission. Journal of Aircraft, vol. 8, July 1971, p. 516-522.
98. Bencze, D. P.  
 Nacelle-Airframe Interference at Low Supersonic Mach Numbers. American  
 Institute of Aeronautics and Astronautics and Society of Automotive  
 Engineers. Joint Propulsion Specialist Conference, 8th, New Orleans,  
 La., Nov. 29-Dec. 1, 1972. AIAA Paper 72-1113.
99. Chapman, G. T.; Compton, D. L.; and Vincenti, W. G.  
 Theory for Radiatively Driven Harmonic Acoustic Waves in a Confined  
 Gas. Physics of Fluids, vol. 16, Aug. 1973, p. 1220-1231.

100. Chyu, W. J.; and Au-Yang, M. K.  
Response of Panels to Turbulence-Induced, Surface-Pressure Fluctuations and Resulting Acoustic Radiation to the Flow Field. American Institute of Aeronautics and Astronautics. Aero-Acoustics Conference, Seattle, Wash., Oct. 15-17, 1973. AIAA Paper 73-993.
101. Coe, C. F.; Chyu, W. J.; and Dods, J. B., Jr.  
Pressure Fluctuations Underlying Attached and Separated Supersonic Turbulent Boundary Layers and Shock Waves. American Institute of Aeronautics and Astronautics. Aero-Acoustics Conference, Seattle, Wash., Oct. 15-17, 1973. AIAA Paper 73-996.
102. Cook, W. J.; and Chapman, G. T.  
Characteristics of the Unsteady Shock-Induced Laminar Boundary Layer on a Flat Plate. Physics of Fluids, vol. 15, Dec. 1972, p. 2129-2139.
103. Davis, S. S.  
Approximate Analytic Solution for the Position and Strength of Shock Waves about Cones in Supersonic Flow. AIAA Journal, vol. 9, Nov. 1971, p. 2287-2289.
104. Davis, S. S.  
Calculation of Sonic Boom Signatures by Bicharacteristic Methods. American Institute of Aeronautics and Astronautics, Aerospace Sciences Meeting, 10th, San Diego, Calif., Jan. 17-19, 1972. AIAA Paper 72-195. (Also published in AIAA JOURNAL, vol. 10, Sept. 1972, p. 1211-1215.)
105. Davis, S. S.  
Noise Generated by a Thin Wing in a Turbulent Jet. American Institute of Aeronautics and Astronautics. Aerospace Sciences Meeting, 11th, Washington, D.C., Jan. 10-12, 1973. AIAA Paper 73-223.
106. Dods, J. B., Jr.; and Hanly, R. D.  
Evaluation of Transonic and Supersonic Wind-Tunnel Background Noise and Effects of Surface Pressure Fluctuation Measurements. American Institute of Aeronautics and Astronautics. Aerodynamic Testing Conference, 7th, Palo Alto, Calif., Sept. 13-15, 1972. AIAA Paper 72-1004.
107. Fujitsuna, Y.; and Tsugé, S.  
On Detonation Waves Supported by Diffusion Flames. I. The Equivalent Chapman-Jouquet Condition. In International Symposium on Combustion, 14th, University Park, Pa., Aug. 20-25, 1972. Proceedings. Pittsburgh, Combustion Institute, 1973, p. 1265-1273; Comments, p. 1274-1275.
108. Fujiwara, T.; and Tsugé, S. -I.  
Quasi-Onedimensional Analysis of Gaseous Free Detonations. Physical Society of Japan. Journal, vol. 33, July 1972, p. 237-241.

109. Gaspers, P. A., Jr.  
On the Calculation of Panel Flutter Boundaries. AIAA, ASME, and SAE. Structures, Structural Dynamics, and Materials Conference, 13th, San Antonio, Tex., Apr. 10-12, 1972. AIAA Paper 72-403.
110. Gregory, T. J.; Williams, L. J.; and Wilcox, D. E.  
Airbreathing Launch Vehicle for Earth Orbit Shuttle - Performance and Operation. Journal of Aircraft, vol. 8, Sept. 1971, p. 724-731.
111. Holloway, P. F.; Wilhold, G. A.; Jones, J. H.; Garcia, F., Jr.; and Hicks, R. M.  
Shuttle Sonic Boom - Technology and Predictions. American Institute of Aeronautics and Astronautics. Aero-Acoustics Conference, Seattle, Wash., Oct. 15-17, 1973. AIAA Paper 73-1039.
112. Hopkins, E. J.; Keener, E. R.; Polek, T. E.; and Dwyer, H. A.  
Hypersonic Turbulent Skin-Friction and Boundary-Layer Profiles on Nonadiabatic Flat Plates. AIAA Journal, vol. 10, Jan. 1972, p. 40-48.
113. Hopkins, E. J.; and Keener, E. R.  
Pressure-Gradient Effects on Hypersonic Turbulent Skin-Friction and Boundary-Layer Profiles. American Institute of Aeronautics and Astronautics. Aerospace Sciences Meeting, 10th, San Diego, Calif., Jan. 17-19, 1972. AIAA Paper 72-215.  
(Also published in AIAA Journal, vol. 10, Sept. 1972, p. 1141-1142.)
114. Johnson, D. A.  
Insensitivity of Single Particle Time Domain Measurements to Laser Velocimeter "Doppler Ambiguity." AIAA Journal, vol. 11, June 1973, p. 890-892.
115. Johnson, D. A.; and Rose, W. C.  
Measurement of Turbulence Transport Properties in a Supersonic Boundary-Layer Flow Using Laser Velocimeter and Hot-Wire Anemometer Techniques. American Institute of Aeronautics and Astronautics. Aero-Acoustics Conference, Seattle, Wash., Oct. 15-17, 1973. AIAA Paper 73-1045.
116. Jorgensen, L. H.  
Estimation of Aerodynamics for Slender Bodies Alone and With Lifting Surfaces at  $\alpha$ 's from  $0^\circ$  to  $90^\circ$ . AIAA Journal, vol. 11, Mar. 1973, p. 409-412.
117. Keener, E. R.; and Polek, T. E.  
Measurements of Reynolds Analogy for a Hypersonic Turbulent Boundary Layer on a Nonadiabatic Flat Plate. AIAA Journal, vol. 10, June 1972, p. 845-846.
118. Keener, E. R.; and Hopkins, E. J.  
Van Driest Generalization Applied to Turbulent Skin Friction and Velocity Profiles Measured on the Wall of a Mach 7.4 Wind Tunnel. AIAA Journal, vol. 11, Dec. 1973, p. 1784-1785.

119. King, L. S.; and Karamcheti, K.  
Propagation of Plane Waves in Flow through a Variable Area Duct. American Institute of Aeronautics and Astronautics. Aero-Acoustics Conference, Seattle, Wash., Oct. 15-17, 1973. AIAA Paper 73-1009.
120. Klineberg, J. M.; and Steger, J. L.  
Calculation of Separated Flows at Subsonic and Transonic Speeds. In International Conference on Numerical Methods in Fluid Mechanics, 3rd, Paris, France, July 3-7, 1972. Proceedings. Vol. 2, Problems of Fluid Mechanics. Berlin and New York, Springer-Verlag, 1973. p. 161-168.
121. Klineberg, J. M.; Kubota, T.; and Lees, L.  
Theory of Exhaust-Plume/Boundary-Layer Interactions at Supersonic Speeds. AIAA Journal, vol. 10, May 1972, p. 581-588.
122. Krupp, J. A.; and Murman, E. M.  
Computation of Transonic Flows Past Lifting Airfoils and Slender Bodies. AIAA Journal, vol. 10, July 1972, p. 880-886.
123. Latham, E. A.; and Sorensen, N. E.  
Method for Increasing Wind Tunnel Mach Number for Large-Scale Inlet Testing. Journal of Aircraft, vol. 10, Oct. 1973, p. 577-578.  
(Also published as AIAA Paper 72-1096)
124. Muhlstein, L., Jr.  
Experimental Evaluation of the Aerodynamic Damping of Skin Panels at Low Supersonic Mach Numbers. AIAA, ASME, and SAE. Structures, Structural Dynamics, and Materials Conference, 13th, San Antonio, Tex., Apr. 10-12, 1972. AIAA Paper 72-402.
125. Murman, E. M.  
Analysis of Embedded Shock Waves Calculated by Relaxation Methods. In AIAA Computational Fluid Dynamics Conference, Palm Springs, Calif., July 19, 20, 1973. Proceedings. New York, American Institute of Aeronautics and Astronautics, Inc., 1973, p. 27-40.
126. Murman, E. M.  
Computation of Wall Effects in Ventilated Transonic Wind Tunnels. American Institute of Aeronautics and Astronautics. Aerodynamic Testing Conference, 7th, Palo Alto, Calif., Sept. 13-15, 1972. AIAA Paper 72-1007.
127. Murman, E. M.  
A Relaxation Method for Calculating Transonic Flows with Detached Bow Shocks. In International Conference on Numerical Methods in Fluid Mechanics, 3rd, Paris, France, July 3-7, 1972. Proceedings. Vol. 2, Problems of Fluid Mechanics. Berlin and New York, Springer-Verlag, 1973. p. 201-205.

128. Murphy, J. D.  
Application of the Generalized Galerkin Method to the Computation of Fluid Flows. In AIAA Computational Fluid Dynamics Conference, Palm Springs, Calif., July 19, 20, 1973. Proceedings. New York, American Institute of Aeronautics and Astronautics, Inc., 1973. p. 63-68.
129. Reda, D. C.; and Murphy, J. D.  
Shock Wave-Turbulent Boundary Layer Interactions in Rectangular Channels. American Institute of Aeronautics and Astronautics. Fluid and Plasma Dynamics Conference, 5th, Boston, Mass., June 26-28, 1972. AIAA Paper 72-715.  
(Also published in AIAA Journal, vol. 11, Feb. 1973, p. 139-140.)
130. Reda, D. C.; and Murphy, J. D.  
Shock Wave-Turbulent Boundary Layer Interactions in Rectangular Channels. Part II. The Influence of Sidewall Boundary Layers on Incipient Separation and Scale of the Interaction. American Institute of Aeronautics and Astronautics. Aerospace Sciences Meeting, 11th, Washington, D.C., Jan. 10-12, 1973. AIAA Paper 73-234.
131. Reda, D. C.; and Murphy, J. D.  
Sidewall Boundary-Layer Influence on Shock Wave/Turbulent Boundary-Layer Interactions. AIAA Journal, vol. 11, Oct. 1973, p. 1367-1368.
132. Rose, W. C.; Page, R. J.; and Childs, M. E.  
Incipient Separation Pressure Rise for a Mach 3.8 Turbulent Boundary Layer. AIAA Journal, vol. 11, May 1973, p. 761-763.
133. Rose, W. C.; and Murphy, J. D.  
Ratio of Reynolds Shear Stress to Turbulence Kinetic Energy in a Boundary Layer, Physics of Fluids, vol. 16, June 1973, p. 935-937.
134. Rose, W. C.; Nielsen, H. L.; and Watson, E. C.  
Shock-Wave, Turbulent Boundary-Layer Interaction on a Blunted Compression Surface. Journal of Spacecraft and Rockets, vol. 9, Apr. 1972, p. 278-280.
135. Rose, W. C.  
Turbulence Measurements in a Compressible Boundary Layer Subjected to a Shock-Wave-Induced Adverse Pressure Gradient. American Institute of Aeronautics and Astronautics. Aerospace Sciences Meeting, 11th, Washington, D.C., Jan. 10-12, 1973, AIAA Paper 73-167.
136. Schwartz, I. R.  
Effects of Rotating Flows on Combustion and Jet Noise. AIAA Fluid and Plasma Dynamics Conference, 5th, Boston, Mass., June 26-28, 1972. AIAA Paper, no. 72-645.



137. Schwartz, I. R.  
Jet Noise Suppression by Swirling the Jet Flow. AIAA Aero-acoustics Conference, Seattle, Wash., Oct. 15-17, 1973. AIAA Paper, no. 73-1003.
138. Smith, R. C.; and Levin, A. D.  
Experimental Aerodynamic Performance Characteristics of a Rotor Entry Vehicle Configuration. II - Transonic. Feb. 1971.  
NASA TN-D-7047 N71-16534
139. Sorensen, N. E.; Smeltzer, D. B.; and Latham, E. A.  
Advanced Supersonic Inlet Technology. Journal of Aircraft, vol. 10, May 1973, p. 278-282.
140. Sorensen, N. E.; and Smeltzer, D. B.  
Performance Estimates for a Supersonic Axisymmetric Inlet System. American Institute of Aeronautics and Astronautics. Aerospace Sciences Meeting, 10th, San Diego, Calif., Jan. 17-19, 1972. AIAA Paper 72-45.  
(Also published in Journal of Aircraft, vol. 9, Oct. 1972, p. 703-706)
141. Sorensen, N. E.; and Bencze, D. P.  
Possibilities for Improved Supersonic Inlet Performance. American Institute of Aeronautics and Astronautics and Society of Automotive Engineers. Propulsion Conference, 9th, Las Vegas, Nev., Nov. 5-7, 1973. AIAA Paper 73-1271.
142. Tsuge, S.  
The Effect of Boundaries on the Velocity Deficit and the Limit of Gaseous Detonations. Combustion Science and Technology, vol. 3, June 1971, p. 195-205.
143. Tsugé, S.  
On the Breakdown of the Molecular Chaos in the Presence of Translational Nonequilibrium. Physics Letters, vol. 36A, Aug. 30, 1971, p. 249-250.
144. Wheeler, A. J.; and Johnston, J. P.  
Assessment of Three-Dimensional Turbulent Boundary-Layer Prediction Methods. Journal of Fluids Engineering, vol. 95, Sept. 1973, p. 415-421.
145. Young, C. H.; Roberge, A. M.; and Reda, D. C.  
Hypersonic Transitional and Turbulent Flow Studies on a Lifting Entry Vehicle. American Inst. of Aeronautics and Astronautics. Aerospace Sciences Meeting, 9th, New York, N.Y., Jan. 25-27, 1971. AIAA Paper 71-100.

PATENTS

146. Schwartz, I. R.  
Exhaust Noises in Jet Engines. Mar. 23, 1973.  
US-PATENT-APPL-SN-344410
  
147. Sorensen, N. E.  
Wind Tunnel Flow Generation Section. July 13, 1973.  
US-PATENT-APPL-SN-379019

FLIGHT SYSTEMS RESEARCH DIVISION

FORMAL REPORTS

148. Aiken, T. N.  
Advanced Augmentor-Wing Research. In NASA. Ames Research Center,  
Moffett Field, Calif. STOL Technology; Conference Held at Moffett  
Field, 17-19 Oct., 1972. 1972. p. 87-96.  
NASA SP-320 N73-32942  
(Also published as NASA TM-X-62250)
149. Aiken, T. N.  
Aerodynamic and Noise Measurements on a Quasi-Two Dimensional  
Augmentor Wind Model with Lobe-Type Nozzles. Sept. 1973.  
NASA TM-X-62237 N74-13719
150. Aiken, T. N.; Aoyagi, K.; and Falarski, M. D.  
Aerodynamic Characteristics of a Large-Scale Model with a Swept Wing  
and a Jet Flap having an Expandable Duct. Sept. 1973.  
NASA TM-X-62281 N74-11826
151. Aiken, T. N.; and Cook, A. M.  
Results of Full-Scale Wind Tunnel Tests on the H.126 Jet Flap Aircraft.  
Apr. 1973.  
NASA TN-D-7252 N73-20997
152. Anderson, S. B.; and Schroers, L. G.  
Considerations for Stability and Control of V/STOL Aircraft: A Review  
of AGARD Report 577. In Advisory Group for Aerospace Research and  
Development, Paris. Stability and Control; Proceedings of the 40th  
Meeting of the Flight Mechanisms Panel of AGARD, Braunschweig,  
W. Germany, 10-13 Apr., 1972. Nov. 1972.  
AGARD-CP-119 N73-16994
153. Anderson, S. B.; and Schroers, L. G.  
Revisions to V/STOL Handling Qualities Criteria of AGARD Report 408.  
In AGARD Handling Qualities Criteria; Proceedings of the AGARD Flight  
Mech. Panel Specialists Meeting, Ottawa, Sept. 28-Oct. 1, 1971.  
June 1972. p. 4-1 - 4-8.  
AGARD-CP-106 N72-32021
154. Anderson, S. B.;  
V/STOL Handling. II. Documentation. In Advisory Group for Aerospace  
Research and Development, Paris. June 1973.  
AGARD-R-577, Part II. N73-27906

155. Aoyagi, K.; Hall, L. P.; and Falarski, M. D.  
Wind-Tunnel Investigation of a Large Scale 35° Swept-Wing Jet Transport  
Model with an External Blowing Triple-Slotted Flap. July 1972.  
NASA TM-X-2600 N72-28009
156. Aoyagi, K.; Falarski, M. D.; and Koenig, D. G.  
Wind Tunnel Investigation of a Large-Scale 25° Swept-Wing Jet Transport  
Model with an External Blowing Triple-Slotted Flap. Nov. 1973.  
NASA TM-X-62197 N74-13721
157. Aoyagi, K.; Falarski, M. D.; and Koenig, D. G.  
Wind Tunnel Investigation of a Large-Scale Upper Surface Blown-Flap  
Transport Model Having Two Engines. Aug. 1973.  
NASA TM-X-62296 N73-32973
158. Aoyagi, K.; and Hall, L. P.  
Wind-Tunnel Investigation of a Large 35° Swept-Wing Jet Transport  
Model with an External-Flow Jet-Augmented Double-Slotted Flap. Aug.  
1971.  
NASA TN-D-6482 N71-32805
159. Atencio, A., Jr.; Kirk, J. V.; Soderman, P. T. and Hall, L.  
Comparison of Flight and Wind Tunnel Measurements of Jet Noise for the  
XV-5B Aircraft. Oct. 1972.  
NASA TM-X-62187 N73-10029
160. Atencio, A., Jr.; and Soderman, P. T.  
Comparison of Wind Tunnel and Flyover Noise Measurements of the  
YOV-10A STOL Aircraft. June 1972.  
NASA TM-X-62166 N72-27031
161. Atencio, A., Jr.; Hall, L. P.; and Kirk, J. V.  
Low Speed Wind Tunnel Investigation of a Large Scale Lift Fan STOL  
Transport Model. Feb. 1973.  
NASA TM-X-62231 N73-20014
162. Atencio, A., Jr.  
Noise Measurements from a Large-Scale Lift Fan Transport in the 40- by  
80-Foot Wind Tunnel. Mar. 1973.  
NASA TM-X-62284 N73-32975
163. Aubrun, J. -N.  
Nonlinear Systems Identification in Presence of Nonuniqueness. Aug.  
1971.  
NASA TN-D-6467 N71-31352
164. Barrack, J. P.; and Kirk, J. V.  
Aerodynamic Characteristics of a Large-Scale Lift-Engine Fighter Model  
with External Swiveling Lift-Engines. July 1972.  
NASA TM-X-62167 N72-28012

165. Bourquin, K.; Palmer, E. A.; Cooper, G.; and Gerdes, R. M.  
Initial Flight and Simulator Evaluation of a Head Up Display for  
Standard and Noise Abatement Visual Approaches. Feb. 1973.  
NASA TM-X-62187 N73-18021
166. Bray, R. S.; Drinkwater, F. J., III; and Fry, E. B.  
The influence of Motion on the Effectiveness of Flight Simulators in  
Training Maneuvers. In NASA Aircraft Safety and Operating Problems,  
Langley Research Center, Langley Station, Va., May 4-6, 1971. Vol. 1.  
Conference Proceedings, 1971. p. 207-220.  
NASA SP-270 N71-30772
167. Bray, R. S.  
Initial Operating Experience with an Aircraft Simulator having Extensive  
Lateral Motion. May 1972.  
NASA TM-X-62155 N72-24335
168. Brown, S. C.  
Computer Simulation of Aircraft Motions and Propulsion System Dynamics  
for the YF-12 Aircraft at Supersonic Cruise Conditions. Aug. 1973.  
NASA TM-X-62245 N73-28990
169. Burrous, C. N.; Brown, S. C.; Goka, T.; and Park, K. E.  
Preliminary Assessment of the Microwave Landing System Requirements for  
STOL Operations. Oct. 1973.  
NASA TM-X-62310 N74-11431
170. Cayot, J. E.; Chubboy, R. A.; and Hynes, C. S.  
Program Plan to Develop Airworthiness Standards for STOL Aircraft.  
In NASA. Ames Research Center, Moffett Field, Calif. STOL Technology;  
Conference Held at Moffett Field, 17-19 Oct., 1972. 1972. p. 345-351.  
NASA SP-320 N73-32959
171. Chigier, N. A.; and Corsiglia, V. R.  
Tip Vortices: Velocity Distributions. Sept. 1971.  
NASA TM-X-62087 N71-36679
172. Chigier, N. A.; and Corsiglia, V. R.  
Wind Tunnel Test Data for Wing Trailing Vortex Flow Survey. May 1972.  
NASA TM-X-62148 N72-23994
173. Cicolani, L. S.  
Position Determination Accuracy from the Microwave Landing System.  
Jan. 1973.  
NASA TN-D-7116 N73-15681
174. Ciffone, D. L.; Orloff, K. L.; and Grant, G. R.  
Laser Doppler Velocimeter Investigation of Trailing Vortices Behind a  
Semi-Span Swept Wing in a Landing Configuration. Aug. 1973.  
NASA TM-X-62294 N73-30244

175. Ciffone, D. L.; and Robinson, G. H.  
A Simulator Investigation of the Influence of Engine Response Characteristics on the Approach and Landing for an Externally Blown Flap Aircraft. Part 2. Aerodynamic Model. May 1973.  
NASA TM-X-62265 N73-26022
176. Cooper, G. E.  
The Pilot-Aircraft Interface. In Vehicle Technology for Civil Aviation: the Seventies and Beyond, Langley Research Center, Langley Station, Va., Nov. 2-4, 1971. Conference Proceedings, 1971. 1971. p. 271-286.  
NASA SP-292 N72-13010
177. Corliss, L. D.; and Dugan, D. C.  
A VTOL Translational Rate Control System Study on a Six Degrees-of-Freedom Motion Simulator. Oct. 1972.  
NASA TM-X-62194 N72-33026
178. Denery, D. G.  
Identification of System Parameters from Input-Output Data with Application to Air Vehicles. Aug. 1971.  
NASA TN-D-6468 N71-32473
179. Denery, D. G.; Bourquin, K. R.; and Drinkwater, F. J., III.  
Preliminary Results on Two-Segment Noise Abatement Studies. Sept. 22 1971.  
NASA TM-X-62098 N72-13985
180. Eckert, W. T.; and Maki, R. L.  
Low-Speed Wind Tunnel Investigation of the Lateral-Directional Characteristics of a Large-Scale Variable Wing-Sweep Fighter Model in the High-Lift Configuration. Oct. 1973.  
NASA TM-X-62306 N74-12714
181. Eckert, W. T.; and Maki, R. L.  
Low-Speed Wind-Tunnel Investigation of the Longitudinal Characteristics of a Large-Scale Variable Wing-Sweep Fighter Model in the High-Lift Configuration. Aug. 1973.  
NASA TM-X-62244 N73-31940
182. Eckert, W. T.; Mort, K. W.; and Piazza, J. E.  
Wind-Sensitivity Studies of a Non-Return Wind Tunnel, with a 216- by 432-mm (8.5- by 17.0-inch) Test Section - Phase I. Sept. 1972.  
NASA TM-X-62171 N72-33245
183. Eckert, W. T.; Mort, K. W.; and Piazza, J. E.  
Wind-Sensitivity Studies of a Non-Return Wind Tunnel with a 216- by 432-mm (8.5- by 17.0-inch) Test Section - Phase II. Aug. 1973.  
NASA TM-X-62307 N74-13949

184. Edwards, F. G.  
Determination of Pilot and Vehicle Describing Functions from the Gemini-10 Mission. May 1972.  
NASA TN-D-6803 N72-24116
185. Edwards, F. G.; and Foster, J. D.  
Flight Test Results from the CV990 Simulated Space Shuttle During Unpowered Automatic Approaches and Landings. Aug. 1973.  
NASA TM-X-62285 N73-27753
186. Erzberger, H.; and Pecsvaradi, T.  
Pilot's Manual for Automated 4D Guidance Systems. Apr. 1973.  
NASA TM-X-62233 N73-25710
187. Erzberger, H.; and Lee, H. Q.  
Terminal-Area Guidance Algorithms for Automated Air-Traffic Control. Apr. 1972.  
NASA TN-D-6773 N72-23017
188. Falarski, M. D.; and Koenig, D. G.  
Acoustic Characteristics of a Large-Scale Augmentor Wing Model at Forward Speed. Nov. 1973.  
NASA TM-X-2940 N74-10052
189. Falarski, M. D.; Aoyagi, K.; and Koenig, D. G.  
Acoustic Characteristics of a Large-Scale Wind-Tunnel Model of an Upper-Surface Blown Flap Transport Having Two Engines. Sept. 1973.  
NASA TM-X-62319 N74-15719
190. Falarski, M. D.  
Acoustic Characteristics of a Semispan Wing Equipped with an Externally Blown Jet Flap including Results at Forward Speed. Mar. 1973.  
NASA TM-X-2749 N73-18041
191. Falarski, M. D.; Aoyagi, K.; and Koenig, D. G.  
Acoustic Characteristics of Large-Scale STOL Models at Forward Speed. In NASA. Ames Research Center, Moffett Field, Calif. STOL Technology; Conference Held at Moffett Field, 17-19 Oct., 1972. 1972. p. 443-454.  
NASA SP-320 N73-32965  
(Also published as NASA TM-X-62251, Oct. 1972)
192. Falarski, M. D.; and Koenig, D. G.  
Aerodynamic Characteristics of a Large Scale Model with a Swept Wing and Augmented Jet Flap. July 1971.  
NASA TM-X-62029 N72-11901
193. Falarski, M. D.; Stroub, R. H.; McCloud, J. L.; and Soderman, P. T.  
An Investigation of a Full-Scale Advancing Blade Concept Rotor System at High Advance Ratio. Aug. 1971.  
NASA TM-X-62081 N71-33517

194. Falarski, M. D.; and Aiken, T. N.  
Large Scale Wind Tunnel Investigation of a Semispan Wing Equipped  
with an Externally-Blown Jet Flap. July 1971.  
NASA TM-X-62079 N72-11902
195. Falarski, M. D.  
Large-Scale Wind-Tunnel Investigation of the Noise Characteristics  
of a Semispan Wing Equipped with an Externally Blown Jet Flap.  
May 1972.  
NASA TM-X-62154 N72-24011
196. Falarski, M. D.; and Koenig, D. G.  
Longitudinal and Lateral Stability and Control Characteristics of a  
Large-Scale Model with a Swept Wing and Augmented Jet Flap. Apr. 1972.  
NASA TM-X-62145 N74-75522
197. Franklin, J. A.; and Innis, R. C.  
Flight-Path and Airspeed Control for the STOL Approach and Landing.  
In NASA. Ames Research Center, Moffett Field, Calif. STOL Technology;  
Conference Held at Moffett Field, 17-19 Oct., 1972. 1972. p. 181-198.  
NASA SP-320 N73-32949
198. Franklin, J. A.; and Innis, R. C.  
Pitch Attitude, Flight Path, and Airspeed Control during Approach and  
Landing of a Powered Lift STOL Aircraft. Dec. 1972.  
NASA TM-X-62203 N73-16014
199. Franklin, J. A.; and Koenig, R. W.  
A Simulator Investigation of the Influence of Engine Response  
Characteristics on the Approach and Landing for an Externally Blown  
Flap Aircraft. Part 1. Description of the Simulation and Discussion  
of Results. May 1973.  
NASA TM-X-62265 N73-26021
200. Fry, E. B.; Gerdes, R. M.; and Schroers, L. G.  
A Piloted Simulation Study of the Effects of Controller Force Gradient  
in VTOL Hovering Flight. Jan. 1973.  
NASA TM-X-62230 N73-17015
201. Giulianetti, D. J.; and Maki, R. L.  
Low Speed Aerodynamic Characteristics of a Large-Scale Model With a  
Thin, Highly Swept, 2.67 Aspect Ratio Wing Having a Cranked Leading  
Edge. Aug. 1972.  
NASA TN-D-6919 N72-27998
202. Greif, R. K.; Fry, E. B.; Gerdes, R. M.; and Gossett, T. D.  
Effect of Stabilization on VTOL Aircraft in Hovering Flight. Aug. 1972.  
NASA TN-D-6900 N72-28015



203. Hall, L. P.; and Kirk, J. V.  
Large-Scale Wind-Tunnel Investigation of a V/STOL Transport Model  
with Podded Lift Fans Forward and Aft of a Low Mounted Wing. Feb.  
1971.  
NASA TM-X-62102 N72-17987
204. Hardy, G. H.  
Space Shuttle Orbiter Handling Quality Criteria Applicable to  
Terminal Area, Approach, and Landing. In Space Shuttle Aerothermo-  
dynamics Technology Conference, Moffett Field, Calif., Dec. 15-16, 1971.  
Vol. IV. Operational Flight Mechanics, Feb. 1972. p. 1239-1263.  
NASA TM-X-25097 N72-20888
205. Hodder, B. K.  
Investigation of the Effect of Inlet Turbulence Length Scale on Fan  
Discrete Tone Noise. Sept. 1973.  
NASA TM-X-62300 N73-31625
206. Innis, R. C.; and Anderson, S. B.  
Comparisons of Simulator and Flight Results on Augmentor-Wing Jet STOL  
Research Aircraft. In NASA. Ames Research Center, Moffett Field,  
Calif. STOL Technology; Conference Held at Moffett Field, 17-19 Oct.,  
1972. 1972. p. 283-290.  
NASA SP-320 N73-32955
207. Jacob, H. G.  
An Engineering Optimization Method with Application to STOL-Aircraft  
Approach and Landing Trajectories. Sept. 1972.  
NASA TN-D-6978 N72-31022
208. Jacobsen, R. A.; and Greif, R. K.  
Simulation Study of the Lift-Roll Coupling Problem for Hovering VTOL  
Aircraft. Aug. 1972.  
NASA TN-D-6906 N72-28020
209. Johnson, W.  
Lifting-Surface Theory for Calculating the Loading Induced on a Wing  
by a Flap. May 1972.  
NASA TN-D-6798 N72-22007
210. Kelly, M. W.; Mort, K. W.; and Hickey, D. H.  
Full Scale Subsonic Wind Tunnel Requirements and Design Studies.  
Sept. 1972.  
NASA TM-X-62184 N72-33246
211. Kelly, M. W.; McKinney, M. O.; and Luidens, R. W.  
The Requirements for a New Full Scale Subsonic Wind Tunnel. Feb. 1972.  
NASA TM-X-62106 N72-19291

212. Kirk, J. V.; Dickinson, S. O.; Hall, L. P.; and Coffman, M. G.  
Aerodynamic Characteristics of a Large Scale Lift Fan Transport Model  
with Podded Fans Forward and Lift Cruise Fans Mounted Above the Wing.  
Apr. 1972.  
NASA TM-X-62151  
N72-24010
213. Koenig, D. G.; and Falarski, M. D.  
Aerodynamic Characteristics of a Swept Augmentor Wing. In NASA. Ames  
Research Center, Moffett Field, Calif. STOL Technology; Conference  
Held at Moffett Field, 17-19 Oct., 1972. 1972. p. 71-86.  
NASA SP-320  
(Also Published as NASA TM-X-62252, Oct. 1972)  
N73-32941
214. Koenig, D. G.; and Falarski, M. D.  
Longitudinal Aerodynamic Characteristics of a Large Scale Model with  
a Swept Wing and Augmented Jet Flap in Ground Effect. Oct. 1972.  
NASA TM-X-62174  
N73-10030
215. Kurkowski, R. L.; Fichtl, G. H.; and Gera, J.  
Development of Turbulence and Wind Shear Models for Simulator Applica-  
tion. In NASA Aircraft Safety and Operating Problems, Langley Research  
Center, Langley Station, Va., May 4-6, 1971. Vol. 1. Conference  
Proceedings, 1971. p. 291-306.  
NASA SP-270  
N71-30778
216. Lee, H. Q.  
A Unified Formalism for Position Determination from Various Navigation  
Measurements. July 1971.  
NASA TN-D-6417  
N71-28930
217. Lezius, D. K.  
Study of the Far Wake Vortex Field Generated by a Rectangular Airfoil  
in a Water Tank. May 1973.  
NASA TM-X-62274  
N73-26288
218. McGee, L. A.; and Christensen, J. V.  
En Route Position and Time Control of Aircraft Using Kalman Filtering  
of Radio Aid Data. Dec. 1973.  
NASA TN-D-7509  
N74-12360
219. McGee, L. A.; Smith, G. L.; Hegarty, D. M.; Carson, T. M.; Merrick,  
R. B.; Schmidt, S. F.; and Conrad, B.  
Flight Results from a Study of Aided Inertial Navigation Applied to  
Landing Operations. Oct. 1973.  
NASA TN-D-7302  
N73-32515

220. McGee, L. A.; Smith, G. L.; Hegarty, D. M.; Merrick, R. B.; Carson, T. M.; and Schmidt, S. F.  
Navigation for Space Shuttle Approach and Landing Using an Inertial Navigation System Augmented by Various Data Sources. In Space Shuttle Integrated Electronics Conference, Manned Spacecraft Center, Houston, Tex., 11-13 May, 1971. Proceedings, v. 1, 1971, p. 221-256.  
NASA TM-X-58063 N71-33061
221. McLean, J. D.  
Preliminary Determination of Spacecraft Trajectories Using On-Board Optical Measurements. Oct. 1971.  
NASA TN-D-6551 N71-38212
222. McNeill, W. E.; Gerdes, R. M.; Innis, R. C.; and Ratcliff, J. D.  
A Flight Study of the Use of Direct-Lift-Control Flaps to Improve Station Keeping During In-Flight Refueling. Oct. 1973.  
NASA TM-X-2936 N73-32970
223. Medan, R. T.; and Ray, K. S.  
Boundary Condition Program for Aerodynamic Lifting Surface Theory. Nov. 1973.  
NASA TM-X-62323 N74-16699
224. Medan, R. T.  
Geometry Program for Aerodynamic Lifting Surface Theory. Sept. 1973.  
NASA TM-X-62309 N74-11810
225. Medan, R. T.; and Ray, K. S.  
Influence Matrix Program for Aerodynamic Lifting Surface Theory. Dec. 1973.  
NASA TM-X-62324 N74-16701
226. Medan, R. T.; and Ray, K. S.  
Plotting Program for Aerodynamic Lifting Surface Theory. Nov. 1973.  
NASA TM-X-62321 N74-14739
227. Medan, R. T.  
Steady, Subsonic, Lifting Surface Theory for Wings with Swept, Partial Span, Trailing Edge Control Surfaces. Apr. 1973.  
NASA TN-D-7251 N73-19999
228. Merrick, R. B.; and Smith, G. L.  
Digital Simulation of Continuous Error Models with Application to an Instrument Landing System Error. Mar. 1973.  
NASA TM-X-62116 N72-22648
229. Merrick, V. K.; and Tinling, B. E.  
Influence of Boom Torsional Rigidity and Thermally Induced Torsion on the Stability of a Semipassive Gravity-Stabilized Satellite. Aug. 1971.  
NASA TN-D-6481 N71-32790

230. Mort, K. W.; Eckert, W. T.; and Kelly, M. W.  
The Steady-State Flow Quality in a Model of a Non-Return Wind Tunnel.  
Aug. 1972. N72-31286  
NASA TM-X-62170
231. Neuman, F.; Merrick, R.; and Martin, C. F.  
The Correlation Structure of Several Popular Pseudorandom Number  
Generators. July 1973. N73-26618  
NASA TM-X-62275
232. Neuman, F.; and Warner, N.  
Generalized Aerodynamic Coefficient Table Storage, Checkout and Inter-  
polation for Aircraft Simulation. Jan. 1973. N73-16983  
NASA TM-X-62229
233. Onken, R.  
Simplified Methods for Interpreting the Effect of Transfer-Function  
Zeros on the Transient Response of Aircraft. July 1972. N72-27024  
NASA TM-X-2585
234. Orloff, K. L.; Ciffone, D. L.; and Lorincz, D.  
Airfoil Wake Vortex Characteristics in the Far Field. Nov. 1973. N74-22625  
NASA TM-X-62318
235. Orloff, K. L.; and Grant, G. R.  
The Application of Laser Doppler Velocimetry to Trailing Vortex  
Definition and Alleviation. Feb. 1973. N73-22448  
NASA TM-X-62243
236. Osder, S.; Neuman, F.; and Foster, J.  
Digital Autopilots: Design Considerations and Simulator Evaluations.  
Oct. 1971. N72-11942  
NASA TM-X-62094
237. Page, V. R.; and Aiken T. N.  
Large-Scale Wind-Tunnel Tests of a Propeller-Driven Deflected Slipstream  
STOL Model in Ground Effect. Oct. 1971. N71-36436  
NASA TM-X-2313
238. Page, V. R.; and Aiken, T. N.  
Stability and Control Characteristics of a Large-Scale Deflected Slip-  
stream STOL Model with a Wing of 5.7 Aspect Ratio. Oct. 1971. N71-36435  
NASA TN-D-6393
239. Pecsvaradi, T.; and Erzberger, H.  
Four-D Guidance of STOL Aircraft in the Terminal Area. In NASA. Ames  
Research Center, Moffett Field, Calif. STOL Technology; Conference  
Held at Moffett Field, 17-19 Oct., 1972. 1972. p. 307-332. N73-32957  
NASA SP-320  
(Also published as NASA TM-X-62234, Oct. 1972)

240. Pope, J. M.; Dimeff, J.; and Abraham, S.  
A Wireless Respiration Failure Detection System. 1972.  
NASA TM-X-68511 N72-73765
241. Power, L. J.  
Application of Modern Control Theory to the Design of Optimum Aircraft  
Controllers. Jan. 1973.  
NASA TM-X-62208 N73-17016
242. Rossow, V. J.  
Theoretical Study of Lift-Generated Vortex Sheets Designed to Avoid  
Roll Up. Sept. 1973.  
NASA TM-X-62304 N73-32976
243. Smith, D.  
Experiment T002: Manual Navigation Sightings. In NASA. Manned Space-  
craft Center, Houston, Tex. The Gemini Program: Physical Sciences  
Experiments Summary. Zeitler, E. G. and Rogers, T. G., Compilers.  
Sept. 1971. p. 61-69.  
NASA TM-X-58075 N72-10861
244. Smith, D. W.; Watson, D.; and Christensen, J. V.  
Terminal-Area STOL Operating Systems Experiments Program. In NASA.  
Ames Research Center, Moffett Field, Calif. STOL Technology; Conference  
Held at Moffett Field, 17-19 Oct., 1972. 1972. p. 333-343.  
NASA SP-320 N73-32958  
(Also published as NASA TM-X-62235)
245. Smith, G. L.  
Ames-Aided Inertial Navigation Work - the First Two Years of Progress.  
Apr. 1973.  
NASA TM-X-62199 N73-22614
246. Snyder, C. T.; Fry, E. B.; Drinkwater, F. J., III; Forrest, R. D.;  
Scott, B. C.; and Benefield, T. D.  
Motion Simulator Study of Longitudinal Stability Requirements for Large  
Delta Wing Transport Airplanes During Approach and Landing with Sta-  
bility Augmentation Systems Failed. Dec. 1972.  
NASA TM-X-62200 N73-15034
247. Snyder, C. T.; Bray, R. S.; Drinkwater, F. J., III; and Forrest, R. D.  
Simulation Studies for Development of Certification Criteria Applicable  
to SST Takeoff. In NASA Aircraft Safety and Operating Problems,  
Langley Research Center, Langley Station, Va., May 4-6, 1971. Vol. 1,  
Conference Proceedings, 1971. p. 277-290.  
NASA SP-270 N71-30777
248. Snyder, C. T.; Drinkwater, F. J., III; Fry, E. B.; and Forrest, R. D.  
Takeoff Certification Considerations for Large Subsonic and Supersonic  
Transport Airplanes Using the Ames Flight Simulator for Advanced  
Aircraft. Mar. 1973.  
NASA TN-D-7106 N73-18031

249. Soderman, P. T.  
Aerodynamic Effects of Leading-Edge Serrations on a Two-Dimensional Airfoil. Sept. 1972.  
NASA TM-X-2643 N72-30992
250. Soderman, P. T.; and Aiken, T. N.  
Full-Scale Wind-Tunnel Tests of a Small Unpowered Jet Aircraft with a T-Tail. Nov. 1971.  
NASA TN-D-6573 N72-10031
251. Soderman, P. T.  
Leading-Edge Serrations Which Reduce the Noise of Low-Speed Rotors. Aug. 1973.  
NASA TN-D-7371 N73-27898
252. Stewart, E. C.  
Economic and Environmental Aspects of STOL Transportation. In NASA. Ames Research Center, Moffett Field, Calif. STOL Technology; Conference Held at Moffett Field, 17-19 Oct., 1972. 1972. p. 23-34.  
NASA SP-320 N73-32937  
(Also published as NASA TM-X-62239)
253. Stroub, R.; Falarski, M. D.; McCloud, J. L.; and Soderman, P. T.  
An Investigation of a Full-Scale Advancing Blade Concept Rotor System at High Advance Ratio. Aug. 1971.  
NASA TM-X-62081 N71-33517
254. Stroub, R. H.  
Helicopter Payload Gains Utilizing Water Injection for Hot Day Power Augmentation. Oct. 1972.  
NASA TM-X-62195 N72-33027
255. White, J. S.; and Lee, H. Q.  
User's Manual for the Variable Dimension Automatic Synthesis Program (VASP). Oct. 1971.  
NASA TM-X-2417 N72-10190
256. Wick, B. H.  
Overview of Technology Sessions. In NASA. Ames Research Center, Moffett Field, Calif. STOL Technology; Conference Held at Moffett Field, 17-19 Oct., 1972. 1972. p. 35-42.  
NASA SP-320 N73-32938

NASA CONTRACTOR REPORTS

257. Anon.  
Design Integration and Noise Studies for Jet STOL Aircraft. Task 7A.  
Augmentor Wing Cruise Blowing Valveless System. Vol. 2. Design  
Exploration. (D6-40829-VOL-2, Boeing Commercial Airplane Co., Seattle,  
Wash.; NAS2-6344.) Oct. 1972.  
NASA CR-114570 N73-27907
258. Anon.  
Study of Nonradial Stators for Noise Reduction. Sept. 1971.  
NASA CR-1882 N71-36118
259. Bies, D. A.  
Investigation of the Feasibility of Making Model Acoustic Measurements  
in the NASA Ames 40- by 80-Foot Wind Tunnel. (NAS2-6206.) 1971.  
NASA CR-114352 N71-30825
260. Campbell, J. M.; Harkonen, D. L.; and O'Keefe, J. V.  
Design Integration and Noise Studies for Jet STOL Aircraft. Task 7C.  
Augmentor Wing Cruise Blowing Valveless System. Vol. 1. Static Testing  
of Augmentor Noise and Performance. (D6-41216-VOL-1, Boeing Commercial  
Airplane Co., Seattle, Wash.; NAS2-6344.) Nov. 1973.  
NASA CR-114622 N74-17752
261. Cole, J. E., III.  
The Influence of a Crossflow on Jet Noise. Nov. 1972.  
NASA CR-2169 N73-12036
262. Conrad, B.; and Schmidt, S. F.  
A Study of Techniques for Calculating Motion-Drive Signals for Flight  
Simulators. (REPT-71-28, Analytical Mechanics Associates, Inc.,  
Mountain View, Calif.; NAS2-5816.) July 1971.  
NASA CR-114345 N71-35385
263. Crowley, K. C.; Jaeger, M. A.; and Meldrum, D. F.  
Aircraft Noise Source and Computer Programs - User's Guide. (D6-60234,  
Boeing Commercial Airplane Co., Seattle, Wash.; NAS2-6969.) July 1973.  
NASA CR-114650 N73-31946
264. Dunn, D. G.; and Peart, N. A.  
Aircraft Noise Source and Contour Estimation. (D6-60233, Boeing  
Commercial Airplane Co., Seattle, Wash.; NAS2-6969.) July 1973.  
NASA CR-114649 N73-31945
265. Dunn, D. G.; Peart, N. A.; Miller, D. L.; and Crowley, K. C.  
Jet Engine Noise Source and Noise Footprint Computer Programs.  
(D6-60169, Boeing Co., Seattle, Wash.; NAS2-6969.) Oct. 1972.  
NASA CR-114517 N73-15708

266. El-Sum, H. M. A.; and Mawardi, O. K.  
Diagnostic Techniques for Measurements of Aerodynamic Noise in Free  
Field and Reverberant Environment of Wind Tunnels. (El-Sum  
Consultants, Atherton, Calif.; NAS2-6872.) May 1973.  
NASA CR-114636 N73-30669
267. Friedland, B.; Ling, C.; and Hutton, M. F.  
Quasi-Optimum Design of a Six Degree of Freedom Moving Base Simulator  
Control System. Oct. 1973.  
NASA CR-2312 N74-10299
268. Gilbert, G. B.; and Hill, P. G.  
Analysis and Testing of Two-Dimensional Slot Nozzle Ejectors with  
Variable Area Mixing Sections. May 1973.  
NASA CR-2251 N73-24034
269. Glass, R. E.; and Tanner, C. S.  
Noise Measurements at Stockton Airport Obtained during Engineering  
Evaluation of Two-Segment Approaches in a 727-222 Aircraft.  
(Hydrospace-Challenger, Inc., San Diego, Calif.; NAS2-7369.)  
Aug. 31, 1973.  
NASA CR-114689 N74-18685
270. Glass, R. E.  
Noise Reductions Achieved on a 720-023B Aircraft using a Two-Segment  
Approach. (HRC-TR-S-205, Hydrospace Research Corp., San Diego, Calif.;  
NAS2-6490.) Dec. 1971.  
NASA CR-114417 N72-18001
271. Hackett, J. E.; and Praytor, E. B.  
Ground Effect for V/STOL Aircraft Configurations and its Simulation  
in the Wind Tunnel. Part 1. Introduction and Theoretical Studies.  
(Lockheed-Georgia Co., Marietta; NAS2-6690.) 1972.  
NASA CR-114495 N73-12283
272. Hackett, J. E.; Boles, R. A.; and Praytor, E. B.  
Ground Effect for V/STOL Aircraft Configurations and its Simulation  
in the Wind Tunnel. Part 2. Experimental Studies. (Lockheed-Georgia  
Co., Marietta; NAS2-6690.) 1972.  
NASA CR-114496 N73-12284
273. Hersh, A. S.; and Hayden, R. E.  
Aerodynamic Sound Radiation from Lifting Surfaces With and Without  
Leading-Edge Serrations. (Bolt, Beranek, and Newman, Inc., Canoga Park,  
Calif.; MAS2-5974.)  
NASA CR-114370 N71-36422
274. Hickman, K. E.; Hill, P. G.; and Gilbert, G. B.  
Analysis and Testing of High Entrainment Single-Nozzle Jet Pumps with  
Variable Mixing Tubes. June 1972.  
NASA CR-2067 N72-27997



275. Hitt, E. F.; Bruckner, J. M. H.; Drago, V. J.; Brown, R. A.; Rea, F. G.; and Porter, R. F.  
Effectiveness Evaluation of STOL Transport Operations. Final Report.  
(Battelle Columbus Labs., Ohio; NAS2-6889.) Feb. 1973.  
NASA CR-114631 N73-25062
276. Hoh, R. H.; Klein, R. H.; and Johnson, W. A.  
Design of a Flight Director/Configuration Management System for  
Piloted STOL Approaches. (STI-TR-1015-3, Systems Technology, Inc.,  
Hawthorne, Calif.; NAS2-6441.) Sept. 1973.  
NASA CR-114688 N74-15715
277. Kazin, S. B.; and Volk, L. J.  
LF336 Lift Fan Modification and Acoustic Test Program. Dec. 1971.  
NASA CR-1934 N72-17004
278. Knight, R. G.; Powell, W. V., Jr.; and Prizlow, J. A.  
Conceptual Design Study of a V/STOL Lift Fan Commercial Short Haul  
Transport. Apr. 1973.  
NASA CR-2185 N73-21930
279. Kretz, M.; Aubrun, J. N.; and Larche, M.  
March 1971 Wind Tunnel Tests of the Dorand DH 2011 Jet Flap Rotor.  
Vol. 1. Final Report. (DH-2011-D-E5-VOL-1, Giravions Dorand Co.,  
Suresnes, France; NAS2-3673.) June 1973.  
NASA CR-114693 N74-13722
280. Kretz, M.; Aubrun, J. N.; and Larche, M.  
March 1971 Wind Tunnel Tests of the Dorand DH 2011 Jet Flap Rotor,  
Vol. 2. Final Report. (DH-2011-D-E5-VOL-2, Giravions Dorand Co.,  
Suresnes, France; NAS2-3673.) June 1973.  
NASA CR-114694 N74-13723
281. Levinsky, E. S.; and Yeh, T. T.  
Analytical and Experimental Investigation of Circulation Control by  
Means of a Turbulent Coanda Jet. Sept. 1972.  
NASA CR-2114 N72-31014
282. Mendenhall, M. R.; Dillenius, M. F. E.; and Spangler, S. B.  
Theoretical Investigation of the Aerodynamic Interference Induced by  
Cruise and Lift Fans on Transport-Type Aircraft. Aug. 1971.  
NASA CR-1730 N71-32453
283. Noiseux, D. U.  
Study of Porous Surface Microphones for Acoustic Measurements in Wind  
Tunnels. (BBN-2539, Bolt, Beranek and Newman, Inc., Cambridge, Mass.;  
NAS2-6844.) Apr. 1973.  
NASA CR-114593 N73-23289

284. O'Keefe, V. O.; and Kelley, G. S.  
Design Integration and Noise Studies for Jet STOL Aircraft. Vol. 1.  
Program Summary. Final Report. (D6-40552-1-VOL-1, Boeing Co.,  
Seattle, Wash.; NAS2-6344.) May 1972. N72-28007  
NASA CR-114471
285. Osder, S.; and Keller, R.  
Study of Automatic and Manual Terminal Guidance and Control Systems  
for Space Shuttle Vehicles. Final Report, Apr.-June, 1971. (REPT-71-  
0025-00-01, Sperry Rand Corp., Phoenix, Ariz.; NAS2-5804.) Dec. 1971.  
NASA CR-114407 N72-16508
286. Osder, S.; and Keller, R.  
Study of Automatic and Manual Terminal Guidance and Control Systems for  
Space Shuttle Vehicles. Vol. 1. Sections 1-3. Final Report, Mar.  
1970-Mar. 1971. (REPT-71-0225-01-00-VOL-1, Sperry Rand Corp., Phoenix,  
Ariz.; NAS2-5804.) Aug. 1971. N72-13585  
NASA CR-114400
287. Osder, S.; and Keller, R.  
Study of Automatic and Manual Terminal Guidance and Control Systems  
for Space Shuttle Vehicles. Vol. 2. Section 4-Appendix B. Final  
Report, Mar. 1970-Mar. 1971. (REPT-71-0225-02-00-VOL-2, Sperry Rand  
Corp., Phoenix, Ariz.; NAS2-5804.) Aug. 1971. N72-13862  
NASA CR-114401
288. Painter, J. A.; and Shannon, J. H.  
A Study to Determine the Applicability of Noise Abatement Approach  
Procedures to McDonnell Douglas Aircraft. Final Report. (MDC-J6220,  
McDonnell-Douglas Corp., Long Beach, Calif.; NAS2-7586.) Dec. 1973.  
NASA CR-114677 N74-15714
289. Plotkin, A.  
Two-Dimensional Laminar Incompressible Separated Flow Past Airfoils.  
(AE-73-1, Maryland Univ., College Park; NGR-21-002-266.) July 1973.  
NASA CR-114656 N73-29185
290. Rao, G. V. R.; Chu, W. T.; and Digumarthi, R. V.  
Theoretical Studies of Tone Noise from a Fan Rotor. Final Report.  
Nov. 1973. N74-10735  
NASA CR-2354
291. Roepcke, F. A.; and Nickson, T. B.  
Design Integration and Noise Studies for Jet STOL Aircraft. Task VIIA.  
Augmentor Wing Cruise Blowing Valveless System. Vol. 1. System Design  
and Test Integration. (D6-40950-VOL-1, Boeing Commercial Airplane Co.,  
Seattle, Wash.; NAS2-6344.) Apr. 1973. N74-17751  
NASA CR-114621

292. Rogers, R. A.; Wohl, B.; and Gale, C. M.  
Flight Evaluation of Two Segment Approaches for Jet Transport Noise Abatement. (American Airlines, Inc., Tulsa, Okla.; NAS2-6501.) June 1973.  
NASA CR-114735 N74-16995
293. Runnels, J. N.; and Gupfa, A.  
Design Integration and Noise Studies for Jet STOL Aircraft. Task VIIC. Augmentor Wing Cruise Blowing Valveless System. Vol. 2. Small-Scale Development Testing of Augmentor Wing Critical Ducting Components. (D6-40879-VOL-2, Boeing Commercial Airplane Co., Seattle, Wash.; NAS2-6344.) Nov. 1973.  
NASA CR-114623 N74-17753
294. Schlundt, R. W.; DeWolf, R. W.; Ausrotas, R. A.; Curry, R. E.; DeMaio, D.; Keene, D. W.; Speyer, J. L.; Weinreich, M.; and Zeldin, S.  
STOL Traffic Environment and Operational Procedures. Final Report. (R-717, Massachusetts Inst. of Tech., Cambridge; NAS2-6437.) Mar. 1972.  
NASA CR-114523 N73-12990
295. Schwind, R. G.; and Allen, H. J.  
The Effects of Leading-Edge Serrations on Reducing Flow Unsteadiness about Airfoils - an Experimental and Analytical Investigation. Final Report. Nov. 1973.  
NASA CR-2344 N74-10019
296. Shollenberger, C. A.  
An Investigation of a Two-Dimensional Propulsive Lifting System. May 1973.  
NASA CR-2250 N73-25997
297. Smith, K. R., Jr.; and Belina, F. W.  
Small V/STOL Aircraft Analysis. Vol. 2. Appendices. (ATR-73(7302)-1-VOL-2, Aerospace Corp., El Segundo, Calif., NAS2-6473.) June 1973.  
NASA CR-114629 N74-10045
298. Solomon, H. L.; and Sokolsky, S.  
An Economic Assessment of STOL Aircraft Potential including Terminal Area Environmental Considerations. Vol. 2. Appendices. (ATR-73(7305)-1-VOL-2, Aerospace Corp., El Segundo, Calif.; NAS2-6473.) July 1973.  
NASA CR-114605 N74-10044
299. Stimpert, D. L.; and Fogg, R. G.  
Effect of Crossflow Velocity on the Generation of Lift Fan Jet Noise in VTOL Aircraft. (General Electric Co., Cincinnati, Ohio; NAS2-5462.) Feb. 1973.  
NASA CR-114571 N73-21929

300. Stimpert, D. L.  
Effect of Crossflow Velocity on VTOL Lift Fan Blade Passing Frequency  
Noise Generation. (General Electric Co., Cincinnati, Ohio; NAS2-5462.)  
Feb. 1973. N73-21928  
NASA CR-114566
301. Tanner, C. S.; and Glass, R. E.  
Noise Measurements Obtained During Visual Approach Monitor Evaluation  
in 747 Aircraft. (HRC-TR-S-213, Hydrospace Research Corp., San Diego,  
Calif.; NAS2-6490.) May 1972. N72-28010  
NASA CR-114478
302. Tanner, C. S.; and Glass, R. E.  
Noise Measurements Taken at LAX During Operational Evaluation of Two-  
Segment Approaches in a 727-200 Aircraft. (HCI-TR-S-231, Hydrospace-  
Challenger, Inc., San Diego, Calif.; NAS2-7369.) Aug. 31, 1973. N74-18686  
NASA CR-114690
303. Webb, H. M.  
Study of Low Density Air Transportation Concepts. Oct. 1972. N72-33028  
NASA CR-2142

JOURNAL ARTICLES, MEETING PAPERS, BOOKS AND CHAPTERS OF BOOKS

304. Ahtye, W. F.  
Thermal Conductivity in Vibrationally Excited Gases. Journal of Chemical  
Physics, vol. 57, Dec. 15, 1972, p. 5542-5555.
305. Atencio, A., Jr.; and Soderman, P. T.  
Comparison of Aircraft Noise Measured in Flight Test and in the NASA  
Ames 40- by 80-Foot Wind Tunnel. American Institute of Aeronautics  
and Astronautics. Aero-Acoustics Conference, Seattle, Wash., Oct. 15-17,  
1973. AIAA Paper 73-1047.
306. Barman, J. F.; Callier, F. M.; and Desoer, C. A.  
 $L^2$ -Stability and  $L^2$ -Instability of Linear Time-Invariant Distributed  
Feedback Systems Perturbed by a Small Delay in the Loop. IEEE Trans-  
actions on Automatic Control, vol. AC-18, Oct. 1973, p. 479-484.
307. Bossel, H. H.; and Orloff, K. L.  
Laser Doppler Anemometer for Water Tunnel Applications. Journal of  
Hydronautics, vol. 6, July 1972, p. 101-105.
308. Bray, R. S.; and Anderson, S. B.  
Simulation Techniques Used in Investigating Aircraft Accidents. In  
International Conference on Atmospheric Turbulence, London, England,  
May 18-21, 1971. Proceedings.

309. Bray, R. S.  
A Study of Vertical Motion Requirements for Landing Simulation.  
Human Factors, vol. 15, Dec. 1973, p. 561-568.  
(Also published as NASA TM-X-62236)
310. Bull, J. S.; and Debra, D. B.  
Precision Pointing Thrustor. American Institute of Aeronautics and  
Astronautics. Guidance and Control Conference, Key Biscayne, Fla.,  
Aug. 20-22, 1973. AIAA Paper 73-858.
311. Burrous, C. N.; and Deboo, G. J.  
Temperature Compensation of Light Emitting Diodes and Photo-diodes.  
In Electro-Optical Systems Design Conference, New York, N.Y.,  
Sept. 14-16, 1971. Proceedings. Chicago. Industrial and Scientific  
Conference Management, Inc., 1971. p. 38-44.
312. Chigier, N. A.; and Corsiglia, V. R.  
Wind-Tunnel Studies of Wing Wake Turbulence. American Institute of  
Aeronautics and Astronautics. Aerospace Sciences Meeting, 10th,  
San Diego, Calif., Jan. 17-19, 1972. AIAA Paper 72-41.
313. Corsiglia, V. R.; Jacobsen, R. A.; and Chigier, N.  
An Experimental Investigation of Trailing Vortices Behind a Wing with  
a Vortex Dissipator. In Symposium on Aircraft Wake Turbulence,  
Seattle, Sept. 1-3, 1970. Aircraft Wake Turbulence and its Detection:  
Proceedings. New York, Plenum Press, 1971, p. 229-242.
314. Corsiglia, V. R.; Schwind, R. G.; and Chigier, N. A.  
Rapid Scanning, Three-Dimensional Hot-Wire Anemometer Surveys of  
Wing-Tip Vortices. Journal of Aircraft, vol. 10, Dec. 1973, p. 752-757.  
(Also published as AIAA Paper 73-681)
315. Denery, D. G.; Bourquin, K. R.; White, K. C.; and Drinkwater, F. J., III.  
Flight Evaluation of Three-Dimensional Area Navigation for Jet Transport  
Noise Abatement. Journal of Aircraft, vol. 10, April 1973, p. 226-231.  
(Also published as AIAA Paper 72-814)
316. Denery, D. G.  
Simplification in the Computation of the Sensitivity Functions for  
Constant Coefficient Linear Systems. IEEE Transactions on Automatic  
Control, vol. AC-16, Aug. 1971, p. 348-350.
317. Erzberger, H.; and Pecsvaradi, T.  
4-D Guidance System Design with Application to STOL Air Traffic Control.  
In Joint Automatic Control Conference, 13th, Stanford, Calif., Aug.  
16-18, 1972. Preprints of Technical Papers. New York, American  
Institute of Aeronautics and Astronautics, Inc., 1972. p. 445-454.

318. Falarski, M. D.; Soderman, P. T.; and Koenig, D. G.  
Aspects of Investigating STOL Noise using Large-Scale Wind-Tunnel Models. Canadian Aeronautics and Space Journal, vol. 19, Feb. 1973, p. 61-69.  
(Also published as NASA TM-X-62164)
319. Feistel, T. W.; Stewart, E. C.; Gerdes, R. M.; and Smith, K. R., Jr.  
A Look at V/STOL for Business Aircraft. Society of Automotive Engineers. National Business Aircraft Meeting, Wichita, Kan., Mar. 15-17, 1972. SAE Paper 720334
320. Franklin, J. A.  
Flight Investigation of the Influence of Turbulence on Lateral-Directional Flying Qualities. Journal of Aircraft, vol. 8, Oct. 1971, p. 795-802.
321. Franklin, J. A.  
Flight Investigation of the Influence of Turbulence on Longitudinal Flying Qualities. Journal of Aircraft, vol. 9, April 1972, p. 273-281.  
(Also published as AIAA Paper 71-905)
322. Gallagher, J. T.; Saworotnow, I.; Seemann, R.; Gossett, T. D.  
A Model-Following Variable Stability System for the NASA ARC X-14B. American Institute of Aeronautics and Astronautics. Aerospace Sciences Meeting, 10th, San Diego, Calif., Jan. 17-19, 1972. AIAA Paper 72-96.  
(Also published in Journal of Aircraft, vol. 9, July 1972, p. 461-469)
323. Goka, T.; Tarn, T. J.; and Zaborszky, J.  
On the Controllability of a Class of Discrete Bilinear Systems. Automatica, vol. 9, Sept. 1973, p. 615-622.
324. Hickey, D. H.; and Kelly, M. W.  
Aspects of Large-Scale, Subsonic, Wind-Tunnel Design for Propulsion Noise Research. American Institute of Aeronautics and Astronautics and Society of Automotive Engineers. Propulsion Conference, 9th, Las Vegas, Nev., Nov. 5-7, 1973. AIAA Paper 73-1279.
325. Hough, G. R.  
Cambered Jet-Flapped Airfoils. Journal of Applied Mechanics, vol. 40, Dec. 1973, p. 1131-1133.
326. Hough, G. R.  
Remarks on Vortex-Lattice Methods. Journal of Aircraft, vol. 10, May 1973, p. 314-317.
327. Hruby, R. J.; and Edgerton, A. T.  
Subsurface Discontinuity Detection by Microwave Radiometry. In International Symposium on Remote Sensing of Environment, 7th, University of Michigan, Ann Arbor, Mich., May 17-21, 1971. Proceedings. Ann Arbor, University of Michigan, 1971. Vol. 1, p. 319-325.

328. Jacob, H. G.  
Hill-Climbing Controller for Plants with any Dynamics and Rapid Drifts. International Journal of Control, 1st Ser., vol. 16, July 1972, p. 17-35.
329. Johnson, W.; and Ham, N. D.  
On the Mechanism of Dynamic Stall. American Helicopter Society. Journal, vol. 17, Oct. 1972, p. 36-45.
330. Johnson, W. R.  
A Perturbation Solution of Rotor Flapping Stability. American Institute of Aeronautics and Astronautics. Atmospheric Flight Mechanics Conference, 2nd, Palo Alto, Calif., Sept. 11-13, 1972. AIAA Paper 72-955.
331. Karmarkar, J. S.  
Application of Positive-Real Functions in Hyperstable Discrete Model-Reference Adaptive System Design. In Hawaii International Conference on System Sciences, 5th, University of Hawaii, Honolulu, Hawaii, Jan. 11-13, 1972. Proceedings. North Hollywood, Calif., Western Periodicals Co., 1972. p. 382-384.
332. Karmarkar, J. S.; and Siljak, D. D.  
A Computer-Aided Regulator Design. In Allerton Conference on Circuit and System Theory, 9th, Monticello, Ill., Oct. 6-8, 1971. Annual Proceedings. Urbana, University of Illinois, 1972. p. 585-594.
333. Karmarkar, J. S.; and Siljak, D. D.  
Maximization of the Region of Exponential Absolute Stability. In Asilomar Conference on Circuits and Systems, 5th, Pacific Grove, Calif., Nov. 8-10, 1971. Conference Record. North Hollywood, Calif., Western Periodicals Co., 1972. p. 114-117.
334. Kirk, J. V.; Hall, L. P.; and Hodder, B. K.  
Aerodynamics of Lift Fan V/STOL Aircraft. American Inst. of Aeronautics and Astronautics. Annual Meeting and Technical Display, 8th, Washington, D.C., Oct. 25-28, 1971. AIAA Paper 71-981.  
(Also published as NASA-TM-X-62086)
335. Landau, I. D.; and Coutriol, B.  
Adaptive Model Following Systems for Flight Control and Simulation. AIAA Aerospace Sciences Meeting, 10th, San Diego, Calif. Jan. 17-19, 1972. AIAA Paper 72-95.  
(Also published in Journal of Aircraft, vol. 9, Sept. 1972, p. 668-674)
336. Landau, I. D.  
A Generalization of the Hyperstability Conditions for Model Reference Adaptive Systems. IEEE Transactions on Automatic Control, vol. AC-17, Apr. 1972, p. 246-247.
337. Landau, I. D.; Sinner, E.; and Courtiol, B.  
Model Reference Adaptive Systems; Some Examples. American Society of Mechanical Engineers, Winter Annual Meeting, New York, N.Y., Nov. 26-30, 1972. ASME Paper 72-WA/AUT-13.

338. Laudau, I. D.  
Synthesis of Discrete Model Reference Adaptive Systems. IEEE Transactions on Automatic Control, vol. AC-16, Oct. 1971, p. 507-508.
339. Lee, H. Q.; McLean, J. D.; and Erzberger, H.  
Guidance and Control Techniques for Automated Air Traffic Control. Journal of Aircraft, vol. 9, July 1972, p. 490-496.
340. Lee, H. Q.; and McLean, J. D.  
Guidance Technique for Automated Air Traffic Control. American Institute of Aeronautics and Astronautics. Aerospace Sciences Meeting, 10th, San Diego, Calif., Jan. 17-19, 1972. AIAA Paper 72-121.
341. Lilley, D. G.; and Chigier, N. A.  
Nonisotropic Exchange Coefficients in Turbulent Swirling Flames from Mean Value Distributions. Combustion and Flame, vol. 16, Apr. 1971, p. 177-189.
342. Martin, C.  
Equivalence of Quadratic Performance Criteria. International Journal of Control, vol. 17, Mar. 1973, p. 653-658.
343. McLean, J. D.; and Tobias, L.  
An Interactive Real Time Simulation for Scheduling and Monitoring of STOL Aircraft in the Terminal Area. American Institute of Aeronautics and Astronautics. Aerospace Sciences Meeting, 11th, Washington, D.C., Jan. 10-12, 1973. AIAA Paper 73-163.  
(Also published in Journal of Aircraft, vol. 10, June 1973, p. 372-378)
344. Messiter, A. F.; Hough, G. R.; and Feo, A.  
Base Pressure in Laminar Supersonic Flow. Journal of Fluid Mechanics, vol. 60, Sept. 18, 1973, p. 605-624.
345. Mort, K. W.; Eckert, W. T.; and Kelly, M. W.  
The Steady-State Flow Quality of an Open Return Wind Tunnel Model. Canadian Aeronautics and Space Journal, vol. 18, Nov. 1972, p. 285-289.
346. Orloff, K. L.; and Logan, S. E.  
Confocal Backscatter Laser Velocimeter with On-Axis Sensitivity. Applied Optics, vol. 12, Oct. 1973, p. 2477-2481.
347. Park, K. E.  
An Approximate Method for the Synthesis of Optimal Control of Distributed Systems. In IEEE Conference on Decision and Control and Symposium on Adaptive Processes, 11th, New Orleans, La., Dec. 13-15, 1972. Proceedings. New York, Institute of Electrical and Electronics Engineers, Inc., 1972, p. 436-440.



348. Park, K. E.; and Kinnen, E.  
Stability of Distributed Parameter Systems. In Joint Automatic Control Conference, 13th, Stanford, Calif., Aug. 16-18, 1972. Preprints of Technical Papers. New York, American Institute of Aeronautics and Astronautics, Inc., 1972. p. 352-357.
349. Pecsvaradi, T.  
Comments on a "Decomposition Algorithm for Solving a Class of Optimal Control Problems." Journal of Mathematical Analysis and Applications, vol. 41, Feb. 1973, p. 486-489.
350. Pecsvaradi, T.  
Optimal Horizontal Guidance Law for Aircraft in the Terminal Area. In Hawaii International Conference on System Sciences, 5th, University of Hawaii, Honolulu, Hawaii, Jan. 11-13, 1972. Proceedings. North Hollywood, Calif., Western Periodicals Co., 1972. p. 264-266.  
(Also published in IEEE Transactions on Automatic Control, vol. AC-17, Dec. 1972, p. 763-772)
351. Pecsvaradi, T.; and Narendra, K. S.  
Reachable Sets for Linear Dynamical Systems. Information and Control, vol. 19, Nov. 1971, p. 319-344.
352. Pope, J. M.; Fryer, T. B.; and Sandler, H.  
An Ingestible Temperature Transmitter. In Conference on Engineering in Medicine and Biology, 24th Annual, Las Vegas, Nev., Oct. 31-Nov. 4, 1971. Washington, D.C., Alliance for Engineering in Medicine and Biology, 1971. Vol. 13, p. 321.
353. Rao, G. V. R.; Chu, W. T.; and Hodder, B. K.  
Rotor Noise due to Inflow Turbulence. American Institute of Aeronautics and Astronautics. Fluid and Plasma Dynamics Conference, 6th, Palm Springs, Calif., July 16-18, 1973. AIAA Paper 73-632.
354. Rossow, V. J.  
Conformal Mapping for Potential Flow About Airfoils with Attached Flap. Journal of Aircraft, vol. 10, Jan. 1973, p. 60-62.
355. Rossow, V. J.  
On the Inviscid Rolled-Up Structure of Lift-Generated Vortices. Journal of Aircraft, vol. 10, Nov. 1973, p. 647-650.  
(Also published as NASA TM-X-62224)
356. Tarn, T. J.; Elliott, D. L.; and Goka, T.  
Controllability of Discrete Bilinear Systems with Bounded Control. In Joint Automatic Control Conference, 14th, Columbus, Ohio, June 20-22, 1973. Preprints of Technical Papers. New York, Institute of Electrical and Electronics Engineers, Inc., 1973. p. 742-745.  
(Also published in IEEE Transactions on Automatic Control, vol. AC-18, June 1973, p. 298-301)

357. Tobias, L.  
Automated Aircraft Scheduling Methods in the Near Terminal Area.  
Journal of Aircraft, vol. 9, Aug. 1972, p. 520-524.  
(Also published as AIAA Paper 72-120)
358. Watts, G. A.; and Biggers, J. C.  
Hingeless Rotor Vibration and Loads at High Advance Ratio. In Status  
of Testing and Modeling Techniques for V/STOL Aircraft. Proceedings  
of the Mideast Region Symposium, Essington, Pa., Oct. 26-28, 1972.  
Philadelphia, Pa., Boeing Vertol Co., 1973.
359. Watts, G. A.; and Biggers, J. C.  
Horizontal Stoppable Rotor Conversion. American Helicopter Society.  
Annual National V/STOL Forum, 27th, Washington, D.C., May 19-21, 1971.  
AHS Preprint 502.
360. Wingrove, R. C.  
Applications of a Technique for Estimating Aircraft States from Recorded  
Flight Test Data. American Institute of Aeronautics and Astronautics.  
Atmospheric Flight Mechanics Conference, 2nd, Palo Alto, Calif.,  
Sept. 11-13, 1972, AIAA Paper 72-965.
361. Wingrove, R. C.  
Quasi-Linearization Technique for Estimating Aircraft States from Flight  
Data. Journal of Aircraft, vol. 10, May 1973, p. 303-307.

#### PATENTS

362. Burrous, C. N.; and Deboo, G. J.  
Temperature Compensated Light Source using a Light Emitting Diode.  
Dec. 5, 1972.  
US-PATENT-3,705,316
363. Feinstein, L.; and Hruby, R. J.  
Method and Apparatus for Swept-Frequency Impedance Measurement of Welds.  
Nov. 30, 1971.  
US-PATENT-3,624,496
364. Hruby, R. J.; Cress, S. B.; and Dunn, W. R.  
Coaxial Inverted Geometry Transistor Having Buried Emitter. Sept. 18,  
1973.  
US-PATENT-3,760,239
365. Lee, R. D.  
Bio-Isolated DC Operational Amplifier. June 30, 1972.  
US-PATENT-APPL-SN-267862

366. Lee, R. D.  
Metallic Intrusion Detector System. July 11, 1972.  
US-PATENT-3,676,772
367. Lee, R. D.  
Ultrasonic Biomedical Measuring and Recording Apparatus. Aug. 18, 1972.  
US-PATENT-APPL-SN-281876
368. Orloff, K. L.; Grant, G. R.; and Gunter, W. D., Jr.  
Dual Wavelength Scanning Doppler Velocimeter. Apr. 18, 1973.  
US-PATENT-APPL-SN-352383
369. Pope, J. M.; and Fryer, T. B.  
Miniature Ingestible Telemeter Devices to Measure Deep Body Temperature.  
Oct. 27, 1972.  
US-PATENT-APPL-SN-301418
370. Walsh, T. M.  
Interferometric Rotation Sensor. Apr. 24, 1973.  
US-PATENT-3,729,260

INSTRUMENTATION DIVISION

FORMAL REPORTS

371. Mayer, A.  
Target Contrast Considerations in Millimeter Wave Radiometry for  
Airborne Navigation. Aug. 1971.  
NASA TM-X-62082

N72-10539

PATENTS

372. Kerwin, W. J.  
Active RC Networks. Sept. 14, 1971.  
US-PATENT-3,605,032

QUIET PROPULSIVE - LIFT AIRCRAFT TECHNOLOGY OFFICE

NASA CONTRACTOR REPORTS

373. Baum, D. W.  
Development of Explosively Driven Launcher for Meteoroid Studies.  
Jan. 1973.  
NASA CR-2143 N73-15272
374. Baum, D. W.  
Explosively Driven Hypervelocity Launcher--Second-Stage Augmentation  
Techniques. (PIFR-245-1, Physics International Co., San Leandro,  
Calif.; NAS2-5860.) Mar. 1973.  
NASA CR-114589 N73-21252

## SIMULATION SCIENCES DIVISION

### FORMAL REPORTS

375. Ganzler, B. C.  
Virtual Image Display for Flight Simulation. July 1971.  
NASA TM-X-2327 N71-28889

### NASA CONTRACTOR REPORTS

376. Schmidt, S. F.; Bjorkman, W. S.; and Conrad, B.  
New Mechanization Equations for Aided Inertial Navigation Systems.  
Dec. 1973.  
NASA CR-2352 N74-12358

### JOURNAL ARTICLES, MEETING PAPERS, BOOKS AND CHAPTERS OF BOOKS

377. Cleveland, W. B.  
The Handling Qualities Simulation Program for the Augmentor Wing Jet  
STOL Research Aircraft. In Fall Joint Computer Conference, Las Vegas,  
Nev., Nov. 16-18, 1971. Proceedings. Montvale, N.J., AFIPS Press,  
1971. p. 213-223.
378. Conrad, B.; Schmidt, S. F.; and Douvillier, J. G.  
Washout Circuit Design for Multi-Degrees-of-Freedom Moving Base  
Simulators. American Institute of Aeronautics and Astronautics. Visual  
and Motion Simulation Conference, Palo Alto, Calif., Sept. 10-12, 1973.  
AIAA Paper 73-929.
379. Markham, J. W.; Stein, S.; Pelligra, R.; Lippe, P.; and Noyes, J.  
Use of a Centrifuge in Treatment of an Intraventricular Metallic Foreign  
Body. Journal of Neurosurgery, vol. 34, June 1971, p. 800-804.
380. Pelligra, R.; Sandler, H.; Rositano, S.; Skrettingland, K.; and  
Mancini, R.  
Advance Techniques for Monitoring Human Tolerance to Positive  $G_z$   
Accelerations. Revue de Medecine Aeronautique et Spatiale, vol. 12,  
1973, p. 301-304.  
(Also published in Aerospace Medical Association. Annual Scientific  
Meeting, 43rd, Bal Harbour, Fla., May 8-11, 1972. Preprints. p. 245-246.)

PATENTS

381. Steinmetz, C. P.  
Energy Limiter for Hydraulic Actuators Patent. Mar. 9, 1971.  
US-PATENT-3,568,572

V/STOL PROJECTS OFFICE

FORMAL REPORTS

382. Cook, W. L.  
Effects of Advanced Technology on STOL Transport Aircraft. In Vehicle Technology for Civil Aviation: The Seventies and Beyond, Langley Research Center, Langley Station, Va., Nov. 2-4, 1971. Conference Proceedings, 1971. p. 359-373.  
NASA SP-292 N72-13016
383. Gambucci, B. J.; and Pearson, J.  
A Unique Model, Suspension, and Excitation System for Launch Vehicle Dynamics Studies. In NRL: The Shock and Vibration Bulletin, Dec. 1969, p. 205-209. Dec. 1971.  
NASA TM-X-67397 N71-76419
384. Holzhauser, C. A.  
Direct-Lift Jet V/STOL Concepts. In NASA. Vehicle Technology for Civil Aviation: The Seventies and Beyond, Langley Research Center, Langley Station, Va., Nov. 2-4, 1971. Conference Proceedings, 1971. p. 333-343.  
NASA SP-292 N72-13014
385. Holzhauser, C. A.; Morello, S. A.; Innis, R. C.; and Patton, J. M., Jr.  
A Flight Evaluation of VTOL Jet Transport Under Visual and Simulated Instrument Conditions. Mar. 1972.  
NASA TN-D-6754 N72-20012  
(Also published as NASA TM-X-62083)
386. Holzhauser, C. A.; and Innis, R. C.  
Safety Considerations for Powered-Lift STOL Aircraft. In NASA. Langley Research Center, Langley Station, Va. NASA Aircraft Safety and Operating Problems. Vol. 1. Conference Proceedings. Conference Held at Langley Station, Va., 4-6 May, 1971. p. 221-231.  
NASA SP-270 N71-30773
387. Post, S. E.; Gambucci, B. J.; and Holzhauser, C. A.  
An Analysis of the Takeoff and Landing Performance of a Jet-Powered STOL Augmentor Wing Design. Aug. 1972.  
NASA TM-X-62176 N72-30001
388. Post, S. E.  
Computer Programs for Estimation of STOL Takeoff, Landing, and Static Performance. Dec. 1972.  
NASA TM-X-62217 N73-16007



389. Quigley, H. C.; and Vomaske, R. F.  
Preliminary Results of Flight Tests of the Augmentor-Wing Jet STOL  
Research Aircraft. In NASA. Ames Research Center, Moffett Field,  
Calif. STOL Technology; Conference Held at Moffett Field, 17-19 Oct.,  
1972. 1972. p. 259-282.  
NASA SP-320 N73-32954
390. Weiberg, J. A.; Giulianetti, D.; Gambucci, B.; and Innis, R. C.  
Takeoff and Landing Performance and Noise Measurements of a Deflected  
Slipstream STOL Airplane with Interconnected Propellers and Rotating  
Cylinder Flaps. Dec. 1973.  
NASA TM-X-62320 N74-13720

#### NASA CONTRACTOR REPORTS

391. Alexander, H. R.; Eason, W.; Gillmore, K.; Morris, J.; and Spittle, R.  
V/STOL Tilt Rotor Aircraft Study. Vol. 7. Tilt Rotor Flight Control  
Program Feedback Studies. (D222-10060-3-VOL-7, Boeing Vertol Co.,  
Philadelphia, Pa.; NAS2-6598.) Mar. 1973.  
NASA CR-114600 N73-30011
392. Allison, R. L.; Mack, M.; and Rumsey, P. C.  
Design Evaluation Criteria for Commercial STOL Transports. (D6-40409,  
Boeing Co., Seattle, Wash.; NAS2-6344.) June 1972.  
NASA CR-114454 N72-31020
393. Anon.  
Advancement of Proprotor Technology. Task 2. Wind-Tunnel Test Results.  
(REPT-300-099-004, Bell Helicopter Co., Fort Worth, Tex.; NAS2-5386.)  
Sept. 30, 1971.  
NASA CR-114363 N74-11834
394. Anon.  
Conceptual Design of a V/STOL Lift Fan Commercial Short Haul Transport.  
Summary. Jan. 1973.  
NASA CR-2184 N73-15041
395. Anon.  
Large Scale Wind Tunnel Investigation of a Folding Tilt Rotor. Task II.  
Final Report. (D272-099-002, Bell Helicopter Co., Fort Worth, Tex.;  
NAS2-5461.) May 1972.  
NASA CR-114464 N72-30013
396. Anon.  
V/STOL Tilt-Rotor Aircraft Study. Vol. I. Conceptual Design of Useful  
Military and/or Commercial Aircraft. (D222-10016-1, Boeing Co.,  
Philadelphia, Pa.; NAS2-6598.) Mar. 1972.  
NASA CR-114437 N73-22964

397. Anon.  
V/STOL Tilt-Rotor Aircraft Study. Vol. II. Preliminary Design of Research Aircraft. (D222-10016-2-VOL-2, Boeing Co., Philadelphia, Pa.; NAS2-6598.) Mar. 1972.  
NASA CR-114438 N73-22965
398. Anon.  
V/STOL Tilt-Rotor Study, Task I. Vol. I. Conceptual Design. (REPT-300-099-005-VOL-1, Bell Helicopter Co., Fort Worth, Tex.; NAS2-6599.) 1972.  
NASA CR-114441 N73-21926
399. Anon.  
V/STOL Tilt-Rotor Study, Task II. Vol. II. Research Aircraft Design. (REPT-300-099-006-VOL-2, Bell Helicopter Co., Fort Worth, Tex.; NAS2-6599.) 1972.  
NASA CR-114442 N73-21927
400. Ashleman, R. H.; and Kavdahl, H.  
The Development of an Augmentor Wing Jet STOL Research Airplane (Modified C-8A). Vol. 1. Summary. (D6-40720-1-VOL-1, Boeing Commercial Airplane Co., Seattle, Wash.; NAS2-6025.) Aug. 1972.  
NASA CR-114503 N73-30016
401. Cichy, D. R.; Harris, J. W.; and MacKay, J. K.  
Flight Tests of a Rotating Cylinder Flap on a North American Rockwell YOY-10 Aircraft. Nov. 1972.  
NASA CR-2135 N73-13020
402. Clymer, D. J.; and Flora, C. C.  
Approach Path Control for Powered-Lift STOL Aircraft. (D6-60222, Boeing Commercial Airplane Co., Seattle, Wash.; NAS2-6344.) Apr. 1973.  
NASA CR-114574 N73-24062
403. Eldridge, W. M.; Ferrell, J. A.; McKee, J. W.; Wayne, J. E., Jr.; and Zabinsky, J. M.  
Conceptual Design Studies of Candidate V/STOL Lift Fan Commercial Short Haul Transport for 1980-85 V/STOL Lift Fan Study. Feb. 1973.  
NASA CR-2183 N73-18038
404. Gibs, J.; Stepniewski, W. Z.; Spencer, R.; and Kohler, G.  
Noise Reduction of a Tilt-Rotor Aircraft including Effects on Weight and Performance. (D222-10062-1, Boeing Vertol Co., Philadelphia, Pa.; NAS2-6784.) June 1973.  
NASA CR-114648 N73-31937
405. Harendra, P. B.; Joglekar, M. J.; Gaffey, T. M.; and Marr, R. L.  
V/STOL Tilt-Rotor Study. Vol. V. A Mathematical Model for Real Time Flight Simulation of the Bell Model 301 Tilt-Rotor Research Aircraft. (BELL-301-099-001-VOL-5, Bell Helicopter Co., Fort Worth, Tex.; NAS2-6599.) Apr. 13, 1973.  
NASA CR-114614 N73-30949

406. Helf, S.; Broman, E.; Gatchel, S.; and Charles, B.  
Full Scale Hover Test of a 25 Foot Tilt Rotor. (REPT-300-099-010,  
Bell Helicopter Co., Fort Worth, Tex.; NAS2-7308.) May 16, 1973.  
NASA CR-114626 N73-25070
407. Magee, J. P.; and Alexander, H. R.  
V/STOL Tilt-Rotor Aircraft Study: Wind Tunnel Tests of a Full Scale  
Hingeless Prop/Rotor Designed for the Boeing Model 222 Tilt-Rotor Air-  
craft. (D222-10059-1, Boeing Vertol Co., Philadelphia, Pa.; NAS2-6505.)  
Oct. 1973.  
NASA CR-114664 N74-15711
408. Mahal, A. S.; and Gilchrist, I. J.  
Design Integration and Noise Studies for Jet STOL Aircraft. Task 7B:  
Wind Tunnel Investigation of a 14-Percent-Thick Airfoil with Upper  
Surface Blowing at High Subsonic Mach Numbers. (D6-60182, Boeing  
Commercial Airplane Co., Seattle, Wash.; NAS2-6344.) Jan. 1973.  
NASA CR-114560 N73-19998
409. Marr, R. L.; Sambell, K. W.; and Neal, G. T.  
V/STOL Tilt-Rotor Study. Vol VI. Hover, Low Speed and Conversion  
Tests of a Tilt-Rotor Aeroelastic Model. (BELL-301-099-002-VOL-6,  
Bell Helicopter Co., Fort Worth, Tex.; NAS2-6599.) May 15, 1973.  
NASA CR-114615 N73-30950
410. McHugh, F. J.; Eason, W.; Alexander, H. R.; and Mutter, H.  
V/STOL Tilt-Rotor Aircraft Study. Vol. X. Performance and Stability  
Test of a 1/4.622 Froude Scaled Boeing Vertol Model 222 Tilt-Rotor  
Aircraft (Phase 1). (D222-10053-1-VOL-10, Boeing Vertol Co., Philadel-  
phia, Pa.; NAS2-6598.) Oct. 1973.  
NASA CR-114603 N74-13727
411. Rosenstein, H.; McVeigh, M. A.; and Mollenkof, P. A.  
V/STOL Tilt-Rotor Aircraft Study. Vol. VIII. Mathematical Model for a  
Real Time Simulation of a Tilt-Rotor Aircraft (Boeing Vertol Model 222).  
(D222-10061-1-VOL-8, Boeing Vertol Co., Philadelphia, Pa.; NAS2-6598.)  
Apr. 1973.  
NASA CR-114601 N73-31947
412. Rosenstein, H.; McVeigh, M. A.; and Mollenkof, P. A.  
V/STOL Tilt-Rotor Aircraft Study. Vol. IX. Piloted Simulator Evalua-  
tion of the Boeing Vertol Model 222 Tilt-Rotor Aircraft. (D222-10052-  
1-VOL-9, Boeing Vertol Co., Philadelphia, Pa.; NAS2-6598.) Feb. 1973.  
NASA CR-114602 N73-30012
413. Rumsey, P. C.; Spitzer, R. E.; and Glende, W. L. B.  
A Design Support Simulation of the Augmentor Wing Jet STOL Research  
Aircraft. (D6-24806-1, Boeing Co., Renton, Wash.; NAS2-6025.) Jan.  
1972.  
NASA CR-114435 N72-22014

414. Rumsey, P. C.; and Spitzer, R. E.  
 Simulator Model Specification for the Augmentor Wing Jet STOL Research Aircraft. (D6-26065TN, Boeing Co., Renton, Wash.; NAS2-6025.) Dec. 1971.  
 NASA CR-114434 N72-22013
415. Skavdahl, H.; and Patterson, D. H.  
 The Development of an Augmentor Wing Jet STOL Research Aircraft (Modified C-8A). Vol. II. Analysis of Contractor's Flight Test. (D6-40720-2-VOL-2, Boeing Commercial Airplane Co., Seattle, Wash.; NAS2-6025.) Aug. 1972.  
 NASA CR-114504 N73-30017
416. Soule, V. H.; and Clark, R. D.  
 A Compendium of Static and Cruise Test Results from a Series of Tests on 13 Ft Diameter Low Disc Loading Rotors. (D160-10021-1, Boeing Co., Philadelphia, Pa.; NAS2-6784.) Mar. 27, 1973.  
 NASA CR-114625 N73-24063
417. Soule, V. H.  
 V/STOL Tilt-Rotor Aircraft Study. Vol. V. Definition of Stowed Rotor Research Aircraft. (D222-10060-1-VOL-5, Boeing Vertol Co., Philadelphia, Pa.; NAS2-6598.) Mar. 1973.  
 NASA CR-114598 N73-30009
418. Soule, V. H.; and Badri-Nath, Y.  
 V/STOL Tilt-Rotor Aircraft Study. Vol. VI. Preliminary Design of a Composite Wing for Tilt-Rotor Research Aircraft. (D222-10060-2-VOL-6, Boeing Vertol Co., Philadelphia, Pa.; NAS2-6598.) Mar. 1973.  
 NASA CR-114599 N73-30010
419. Spitzer, R. E.  
 Predicted Flight Characteristics of the Augmentor Wing Jet STOL Research Aircraft. (D6-40381, Boeing Co., Renton, Wash.; NAS2-6025.) July 1972.  
 NASA CR-114463 N72-28017
420. Stapleford, R. L.; Klein, R. H., and Hob, R. H.  
 Handling Qualities Criteria for the Space Shuttle Orbiter During the Terminal Phase of Flight. Apr. 1972.  
 NASA CR-2017 N72-23914

JOURNAL ARTICLES, MEETING PAPERS, BOOKS AND CHAPTERS OF BOOKS

421. Deckert, W. H.; and Holzhauser, C. A.  
 Evaluation of V/STOL Research Aircraft Design. Society of Automotive Engineers. National Aerospace Engineering and Manufacturing Meeting, Los Angeles, Calif., Oct. 16-18, 1973. SAE Paper 730947.

422. Deckert, W. H.; and Evans, R. C.  
NASA Lift Fan V/STOL Transport Technology Status. Society of Automotive Engineers. National Aerospace Engineering and Manufacturing Meeting, San Diego, Calif., Oct. 2-5, 1972. SAE Paper 720856.
423. Edenborough, H. K.; Gaffey, T. M.; and Weiberg, J. A.  
Analyses and Tests Confirm Design of Proprotor Aircraft. American Institute of Aeronautics and Astronautics. Aircraft Design, Flight Test, and Operations Meeting, 4th, Los Angeles, Calif., Aug. 7-9, 1972. AIAA Paper 72-083.
424. Poisson-Quinton, Ph.; and Cook, W. L.  
A Summary of Wind Tunnel Research on Tilt-Rotors from Hover to Cruise Flight. Onera, TP No. 1133, 1972.  
(Also published as AGARD-CP-111 and NASA TM-X-68948)
425. Quigley, H. C.; Sinclair, S. R. M.; Nark, T. C., Jr.; and O'Keefe, J. V.  
A Progress Report on the Development of an Augmentor Wing Jet STOL Research Aircraft. Society of Automotive Engineers. National Aeronautic and Space Engineering and Manufacturing Meeting, Los Angeles, Calif., Sept. 28-30, 1971. SAE Paper 710757.
426. Spitzer, R. E.; Rumsey, P. C. and Quigley, H. C.  
Use of the Flight Simulator in the Design of a STOL Research Aircraft. American Institute of Aeronautics and Astronautics. Aircraft Design, Flight Test, and Operations Meeting, 4th, Los Angeles, Calif., Aug. 7-9, 1972. AIAA Paper 72-762.

#### PATENTS

427. Boissevain, A. G.; and Nelson, B. W.  
Optical Machine Tool Alignment Indicator Patent. Feb. 23, 1971.  
US-PATENT-3,565,530

ASTRONAUTICS DIRECTORATE

FORMAL REPORTS

428. Anon.  
Evidence for an Angular Momentum Flux in the Solar Wind. In Solar Wind; Proceedings of a Conference Held at Pacific Grove, Calif., 21-26 Mar., 1971. Sonnett, C. P.; Coleman, P. J., Jr.; and Wilcox, J. M., Editors. 1972. p. 261-275.  
NASA SP-308 N73-10784
429. Anon.  
Evidence for Changes in the Angular Velocity of the Surface Regions of the Sun and Stars. In Solar Wind; Proceedings of a Conference Held at Pacific Grove, Calif., 21-26 Mar., 1971. Sonett, C. P.; Coleman, P. J., Jr.; and Wilcox, J. M., Editors. 1972. p. 276-286.  
NASA SP-308 N73-10785
430. Anon.  
Evidence for the Distribution of Angular Velocity Inside the Sun and Stars. In Solar Wind; Proceedings of a Conference Held at Pacific Grove, Calif., 21-26 Mar., 1971. Sonnett, C. P.; Coleman, P. J., Jr.; and Wilcox, J. M., Editors. 1972. p. 287-306.  
NASA SP-308 N73-10786
431. Sonett, C. P.; and Colburn, D. S.  
MIE Scattering of the Interplanetary Magnetic Field by the Whole Moon. Jan. 1973.  
NASA TM-X-62225 N73-16833
432. Sonnett, C. P.; Coleman, P. J., Jr.; and Wilcox, J. M., Editors.  
Solar Wind; Proceedings of a Conference Held at Pacific Grove, Calif., 21-26 Mar. 1971. Washington, 1972.  
NASA SP-308 N73-10760

NASA CONTRACTOR REPORTS

433. Schwartz, K.; and Schubert, G.  
Lunar Electromagnetic Scattering. I. Propagation Parallel to the Diamagnetic Cavity Axis. (California Univ., Los Angeles; NAS2-6876.) Dec. 1, 1972.  
NASA CR-114546 N73-15861
434. Schwartz, K.; and Schubert, G.  
Topology of Induced Lunar Magnetic Fields. (California Univ., Los Angeles; NAS2-6876.) 1973.  
NASA CR-114545 N73-15860

JOURNAL ARTICLES, MEETING PAPERS, BOOKS AND CHAPTERS OF BOOKS

435. Compton, D. L.; and Cooper, D. M.  
Duplication in a Shock Tube of Stagnation Region Conditions on a Jovian Atmosphere-Entry Probe. In Recent Developments in Shock Tube Research; Proceedings of the Ninth International Symposium, Stanford, Calif., July 16-19, 1973. Stanford, Calif., Stanford University Press, 1973. p. 318-329.
436. Compton, D. L.; Chapman, G. T.; and Baganoff, D.  
Experiments on Radiatively Driven Harmonic Acoustic Waves in a Confined Gas. *Physics of Fluids*, vol. 16, Aug. 1973, p. 1232-1244.
437. Schubert, G.; Sonett, C. P.; Lee, H. J.; and Schwartz, K.  
Induced Magnetosphere of the Moon. I. Theory. *Journal of Geophysical Research*, vol. 78, May 1, 1973, p. 2094-2110. (Also published as NASA TM-X-62227)
438. Schubert, G.; Schwartz, K.; Sonett, C. P.; Colburn, D. S.; and Smith, B. E.  
Lunar Electromagnetic Scattering. II. Magnetic Fields and Transfer Functions for Parallel Propagation. In Lunar Science Conference, 4th, Houston, Tex., March 5-8, 1973. Proceedings. New York, Pergamon Press, Inc., 1973. Vol. 3, p. 2909-2923.
439. Sonett, C. P.; Mihalov, J. D.; and Ness, N. F.  
Concerning the Electrical Conductivity of the Moon. *Journal of Geophysical Research*, vol. 76, Aug. 1, 1971, p. 5172-5180.
440. Sonett, C. P.; Fahleson, U.; and Alfvén, H.  
Electrodynamic Sailing: Beating into the Solar Wind. *Science*, vol. 178, Dec. 8, 1972, p. 1115-1119.
441. Sonett, C. P.; and Runcorn, S. K.  
Electromagnetic Evidence Concerning the Lunar Interior and its Evolution. *The Moon*, vol. 8, Sept. 1973, p. 308-334.
442. Sonett, C. P.; and Runcorn, S. K.  
How to use Magnetic Fields for Fun and Profit. *Comments on Modern Physics. Part C. Comments on Astrophysics and Space Physics*, vol. 3, Sept.-Oct. 1971, p. 149-154.  
(Also published as NASA TM-X-62023)
443. Sonett, C. P.; Dyal, P.; Colburn, D. S.; Mihalov, J. D.; Parkin, C. W.; Smith, B. F.; Schubert, G.; and Schwartz, K.  
Induced and Permanent Magnetism on the Moon - Structural and Evolutionary Implications. In International Astronomical Union, General Assembly, 14th, Brighton, England, Aug. 18-27, 1970. *Highlights of Astronomy; Proceedings*. Dordrecht, D. Reidel Publishing Co., 1971. Vol. 2, p. 173-188.

444. Sonett, C. P.; Smith, B. F.; Colburn, D. S.; Schubert, G.; and Schwartz, K. The Induced Magnetic Field of the Moon: Conductivity Profiles and Inferred Temperature. In Lunar Science Conference, 3rd, Houston, Tex., Jan. 10-13, 1972. Proceedings. Cambridge, Mass., MIT Press, 1972. Vol. 3, p. 2309-2336.  
(Also published as NASA TM-X-62153)
445. Sonett, C. P.; Schubert, G.; Smith, B. F.; Schwartz, K.; and Colburn, D. S. Lunar Electrical Conductivity from Apollo 12 Magnetometer Measurements: Compositional and Thermal Inferences. Lunar Science Conference, 2d, Houston, Tex., Jan. 11-14, 1971. Proceedings. Boston, MIT Press, 1971. Vol. 3, p. 2415-2431. (Geochimica et Cosmochimica Acta. Supplement 2)  
(Also published as NASA TM-X-62019)
446. Sonett, C. P.; and Mihalov, J. D. Lunar Fossil Magnetism and Perturbations of the Solar Wind. Journal of Geophysical Research, vol. 77, Feb. 1, 1972, p. 588-603.  
(Also published as NASA TM-X-62026)
447. Sonett, C. P. Planetary Magnetism in the Outer Solar System. Space Science Reviews, vol. 14, Mar.-May 1973, p. 552-558.
448. Sonett, C. P. Space Probe. Encyclopedia of Science and Technology. 3d edition. N.Y., McGraw-Hill, 1971. p. 633-655.



CHEMICAL RESEARCH PROJECTS OFFICE

FORMAL REPORTS

449. Cagliostro, D. E.; and Winkler, E. L.  
Methanator Fueled Engines for Pollution Control. March 1973.  
NASA TM-X-62186 N73-31144
450. Fish, R. H.  
The Performance of Lightweight Plastic Foams Developed for Fire Safety.  
In Conference on Materials for Improved Fire Safety, Manned Spacecraft  
Center, Houston, Tex., May 6-7, 1970. 1971. p. 103-110.  
NASA SP-5096 N72-16420
451. Fohlen, G. M.; Parker, J. A.; Riccitiello, S. R.; and Sawko, P. M.  
Intumescence: An In Situ Approach to Thermal Protection. In Confer-  
ence on Materials for Improved Fire Safety, Manned Spacecraft Center,  
Houston, Tex., May 6-7, 1970. 1971. p. 111-119.  
NASA SP-5096 N72-16421
452. Kourtides, D. A.; and Parker, J. A.  
Chemical Research Projects Office: Functions, Accomplishments, and  
Programs. Sept. 1972.  
NASA TM-X-62186 N72-31144
453. Neel, C. B.; and Fish, R. H.  
Study of Protection of Passengers in Aircraft Crash Fires. In NASA  
Aircraft and Operating Problems, Langley Research Center, Langley  
Station, Va., May 4-6, 1971. Conference Proceedings, 1971. Vol. 1,  
p. 11-31.  
NASA SP-270 N71-30758
454. Riccitiello, S. R.; and Heising, K. W.  
The Application of Space Program Fire Retardent Technology to Housing.  
Aug. 1973.  
NASA TN-D-7370 N73-28592
455. Young, W.; and Parker, J. A.  
Effect of Freons on Acetylcholinesterase Activity and Some Counter  
Measures. In Conference on Environmental Toxicology, 3rd, Fairbairn,  
Ohio, Oct. 1972. Proceedings. 1972. Paper no. 17.  
AMRL-TR-72-130 N74-73410

NASA CONTRACTOR REPORTS

456. Hoffman, J.; and Schwartz, H. R.  
Formulation and Production of Intumescent Coating Systems. (Hughes Air-  
craft Co., Culver City, Calif.; NAS2-6387.) 1973.  
NASA CR-114470 N73-32468

457. Jennings, R. R.; MacWilliams, D. C.; Foshee, W. C.; and Katzer, M. F.  
Study to Optimize Gellant Polymer-Water Systems for the Control of  
Hypergolic Spills and Fires. Mar. 1973.  
NASA CR-2198 N73-19789
458. Mayo, F. R.  
Review of Oxidative Degradations of Certain Heterocyclic Polymers.  
(Stanford Research Inst., Menlo Park, Calif.; NAS2-6464.) Nov. 1971.  
NASA CR-114377 N72-12067
459. Pannell, C. E.; and Magner, J. E.  
Synthesis of Optically Clear Polymeric Materials for High Temperature  
Windows. Final Report. (Dow Chemical Co., Walnut Creek, Calif.;  
NAS2-6388.) Feb. 28, 1973.  
NASA CR-114681 N74-10112
460. Parker, J. A.  
New Fire Retardant Foams and Intumescent. In Fireproofing and Safety  
Symposium, University of Southern California, Los Angeles, Calif.,  
May 27, 1971. Proceedings. 1971. p. 55-108.  
NASA CR-125412 N72-15898
461. Van Buren, K. E.  
Synthesis of Terephthalonitrile N, N-Dioxide. Final Report. (Hughes  
Aircraft Co., Culver City, Calif.; NAS2-7831.) Dec. 1973.  
NASA CR-114705 N74-14864

JOURNAL ARTICLES, MEETING PAPERS, BOOKS AND CHAPTERS OF BOOKS

462. Cagliostro, D. E.; Goldstein, H.; and Parker, J. A.  
Silica Reinforcement and Char Reactions in the Apollo Heat Shield.  
Journal of Spacecraft and Rockets, vol. 9, May 1972, p. 346-350.
463. Collins, G. R.; and Riccitiello, S. R.  
An Anomalous Reaction of Aceto-4-(or 6-) Nitro-2, 5-Xylidides with  
Hydrochloric Acid. Journal of Organic Chemistry, vol. 37, 1972,  
p. 3353-3354.
464. D'Alelio, G. F.  
Structural Design and Thermal Properties of Polymers. In Symposium on  
Ablative Plastics, San Francisco, 1968. Ablative Plastics; Papers.  
D'Alelio, G. F. and Parker, J. A., Editors. New York, Dekker, 1971.  
p. 85-126.
465. Dickey, R. R.; Lundell, R. H.; and Parker J. A.  
The Development of Polybenzimidazole Composites as Ablative Heat Shields.  
In Symposium on Ablative Plastics, San Francisco, 1968. Ablative  
Plastics; Papers. D'Alelio, G. F. and Parker, J. A., Editors. New  
York, Dekker, 1971. p. 247-258.

466. Gilwee, W. J.; Rosser, R. W.; and Parker, J. A.  
High Temperature Resistant Composites from Bismaleimide Resin. In  
New Horizons in Materials and Processing; Proceedings of the 18th  
National Symposium and Exhibition, Los Angeles, Calif., Apr. 3-5, 1973.  
Azusa, Calif., Society for the Advancement of Material and Process  
Engineering, 1973. p. 284-291.
467. Golub, M. A.  
Photochemistry of Unsaturated Polymers. Pure and Applied Chemistry,  
vol. 30, 1972, p. 105-117.
468. Golub, M. A.; and Parker, J. A., Editors.  
Polymeric Materials for Unusual Service Conditions; Proceedings of the  
Conference, Moffett Field, Calif., Nov. 29-Dec. 1, 1972. New York,  
Wiley-Interscience, 1973. (Applied Polymer Symposia, no. 22)
469. Golub, M. A.; and Sung, M.-T.  
Thermal Cyclization of 1,2-Polybutadiene and 3,4-Polyisoprene. Journal  
of Polymer Science. Part B. Polymer Letters, vol. 11, Feb. 1973,  
p. 129-138.
470. Golub, M. A.; and Gargiulo, R. J.  
Thermal Degradation of 1,4-Polyisoprene and 1,4-Polybutadiene. Journal  
of Polymer Science. Part B. Polymer Letters, vol. 10, Jan. 1972,  
p. 41-49.
471. Lerner, N. R.; and Cagliostro, D. E.  
Flame Inhibition by Hydrogen Halides: Some Spectroscopic Measurements.  
Combustion and Flame, vol. 21, Dec. 1973, p. 315-320.
472. Neel, C. B.; Parker, J. A.; Fish, R. H.; Henshaw, J.; Newland, J. H.;  
and Tempesta, F. L.  
Heat Shields for Aircraft - A New Concept to Save Lives in Crash Fires.  
Astronautics and Aeronautics, vol. 9, Nov. 1971, p. 18-26.
473. Riccitiello, S. R.; Fohlen, G. M.; and Parker, J. A.  
Thermal Reactions of N,N' Bis(p-Nitrophenyl)Sulfamide and p-Benzo-  
quinone Dioxime - Acid Mixtures. Journal of Polymer Science. Part A-1.  
Polymer Chemistry, vol. 9, Feb. 1971, p. 317-323.
474. Sawko, P. M.; Fontes, E. J.; and Riccitiello, S. R.  
An Intumescent Coating for Improved Fuel Fire Protection of Heat  
Sensitive Articles. Journal of Paint Technology, vol. 44, Aug. 1972,  
p. 51-55.
475. Sung, M.-T.; and Parker, J. A.  
Amphetamines: Correlation of Activity with Stability of Molecular  
Complexes. National Academy of Sciences. Proceedings, vol. 69,  
June 1972, p. 1346-1347.

476. Sung, M.-T.; and Parker, J. A.  
Molecular Complexes of Methoxyindoles with 1,3,5-Trinitrobenzene and  
Tetracyanoethylene (Spectroscopy/Association Constants/NMR). National  
Academy of Sciences. Proceedings, vol. 69, May 1972, p. 1196-1200.
477. Symposium on Ablative Plastics, San Francisco, 1968. Ablative Plastics;  
Papers. Held March 31-April 5, 1968, American Chemical Society,  
Division of Organic Coating and Plastics Chemistry, San Francisco.  
D'Alelio, G. F.; and Parker, J. A., Editors. New York, Dekker, 1971.  
(Also published in Journal of Macromolecular Science (Chemistry),  
vol. A3, nos. 3 and 4, 1969)
478. Vojvodich, N. S.  
Hypervelocity Heat Protection--a Review of Laboratory Experiments.  
In Symposium on Ablative Plastics, San Francisco, 1968. Ablative  
Plastics; Papers. D'Alelio, G. F.; and Parker, J. A., Editors. New  
York, Dekker, 1971. p. 41-68.
479. Winkler, E. L.; and Parker, J. A.  
Molecular Configuration and Pyrolysis Reactions of Phenolic-Novolaks.  
Journal of Macromolecular Science. Part C. Reviews of Macromolecular  
Chemistry, vol. C5, 1971, p. 245-274.

#### PATENTS

480. Fish, R. H.; Parker, J. A.; and Rosser, R. W.  
Fiber Modified Polyurethane Foam for Ballistic Protection. Patent  
Application. Sept. 17, 1973.  
US-PATENT-APPL-SN-398885
481. Parker, J. A.; Dimeff, J.; and Heimbuch, A. H.  
Chromato-Fluorographic Drug Detector. Apr. 25, 1973.  
US-PATENT-APPL-SN-354611
482. Parker, J. A.; and Riccitiello, S. R.  
Flexible Fire Retardant Polyisocyanate Modified Neoprene Foam -  
For Thermal Protective Devices. Patent. Nov. 13, 1973.  
US-PATENT-3,772,220
483. Riccitiello, S. L.; and Parker, J. A.  
Intumescent Composition, Foamed Product Prepared Therewith, and Process  
for Making Same. May 1, 1973.  
US-PATENT-3,730,891
484. Rosser, R. W.  
Polyimide Foam for Thermal Insulation and Fire Protection. Patent.  
Nov. 13, 1973.  
US-PATENT-3,772,216

485. Sawko, P. M.  
Intumescent Paint Containing Nitrile Rubber. Nov. 14, 1972.  
US-PATENT-3,702,841
486. Sawko, P. M.  
Polymeric Vehicles as Carriers for Sulfonic Acid Salt of  
Nitrosubstituted Aromatic Amines. May 16, 1972.  
US-PATENT-3,663,464

SPACE SCIENCE DIVISION

FORMAL REPORTS

487. Adler, R. J.; and Sheffield, C.  
Algebraically Special Space-Time in Relativity, Black Holes,  
and Pulsar Models. Aug. 1973.  
NASA TM X-62298  
N73-32742
488. Anderson, D. L.; Cunningham, B. E.; Dahms, R. G.; and Morgan, R. G.  
Particle Impact and Optical Property Analysis of the Surfaces of  
Surveyor 3 Materials. In Analysis of Surveyor 3 Material and  
Photographs Returned by Apollo 12. 1972. p. 76-89.  
NASA SP-284  
N72-26740
489. Barnes, A.  
Microscale Fluctuations in the Solar Wind. In Solar Wind; Proceedings  
of a Conference Held at Pacific Grove, Calif., 21-26 Mar., 1971.  
Sonett, C. P., Coleman, P. J., Jr. and Wilcox, J. M., Editors. 1972.  
p. 333-352.  
NASA SP-308  
N73-10788
490. Barnes, A.; and Hartle, R. E.  
Model for Energy Transfer in the Solar Wind: Model Results. In  
Solar Wind; Proceedings of a Conference Held at Pacific Grove, Calif.,  
21-26 Mar., 1971. Sonett, C. P., Coleman, P. J., Jr., and Wilcox,  
J. M., Editors. 1972. p. 219-226.  
NASA SP-308  
N73-10777
491. Blanchard, M. B.  
Artificial Meteor Ablation Studies. In Hemenway, C. L., Millman,  
P. M. and Cook, A. F., Editors. Evolutionary and Physical Properties  
of Meteoroids. Proceedings of the International Astronomical Union's  
Colloquium, no. 13, Albany, N.Y., 14-17 June, 1971. 1973. p. 241-254.  
NASA SP-319  
N74-19459
492. Blanchard, M. B.; and Cunningham, G. G.  
Artificial Meteor Ablation Studies: Olivine. Oct. 1973.  
NASA TM-X-62312  
N74-13563
493. Bunch, T. E.; and Olsen, E.  
Ortho- and Clinopyroxene Compositions in Ordinary Chondrites and  
Related Blander Model Calculation Procedures. Mar. 1973.  
NASA TM-X-62259  
N73-24835
494. Colburn, D. S.  
Lunar Magnetic Field Measurements, Electrical Conductivity Calcula-  
tions and Thermal Profile Inferences. Oct. 1971.  
NASA TM-X-62093  
N72-12829

495. Colburn, D. S.; Sonett, C. P.; and Schwartz, K.  
Unipolar Interaction of Mercury with the Solar Wind: The Steady  
State Bow Shock Problem. July 1971.  
NASA TM-X-62028 N71-29923
496. Colin, L.; Chan, K. L.; and Madsen, R. G.  
Closed-Loop Ionogram Processor for the Analysis of Topside Sounder  
Ionogram Films (Filmclip). Mar. 1971.  
NASA TN-D-6204 N71-18406
497. Dyal, P., Parkin, C. W.; Sonett, C. P.; DuBois, R. L.; and Simmons, G.  
Lunar Portable Magnetometer Experiment. In NASA. Lyndon B.  
Johnson Space Center, Houston, Tex. Apollo 16 Preliminary Science  
Report, Washington, D.C., 1971. p. 227-237.  
NASA SP-272. N71-30967
498. Dyal, P.; Parkin, C. W.; Sonett, C. P.; DuBois, R. L.; and Simmons, G.  
Lunar Portable Magnetometer Experiment. In NASA. Lyndon B.  
Johnson Space Center, Houston, Tex. Apollo 16 Preliminary Science  
Report. Washington, D.C. 1972. p. 12-1 - 12-8.  
NASA SP-315 N73-21744
499. Dyal, P.; Parkin, C. W.; and Sonett, C. P.  
Lunar-Surface Magnetometer Experiment. In NASA. Manned Spacecraft  
Center, Houston, Tex. Apollo 15 Preliminary Science Report. 1972.  
p. 9-1 - 9-16.  
NASA SP-289 N72-22823
500. Dyal, P.; Parkin, C. W.; Colburn, D. S.; and Schubert, G.  
Lunar Surface Magnetometer Experiment. In NASA. Lyndon B. Johnson  
Space Center, Houston, Tex. Apollo 16 Preliminary Science Report.  
1972. p. 11-1 - 11-14.  
NASA SP-315 N73-21743
501. Dyal, P.; Parkin, C. W.; and Daily, W. D.  
Surface Magnetometer Experiments: Internal Lunar Properties. Apr.  
1973.  
NASA TM-X-62278 N73-26842
502. Dyal, P.; Parkin, C. W.; and Daily, W. D.  
Temperature and Electrical Conductivity of the Lunar Interior from  
Magnetic Transient Measurements in the Geomagnetic Tail. 1973.  
NASA TM-X-70083 N74-27338
503. Greeley, R.  
Lunar Hadley Rille: Considerations of its Origin. Jan. 1971.  
NASA TM-X-62011 N71-14687

504. Greeley, R.  
 Mariner 9 Photographs of Small-Scale Volcanic Structures on Mars.  
 Dec. 1972.  
 NASA TM-X-62222 N73-18841
505. Greeley, R.; Iversen, J. D.; Pollack, J. B.; Udovich, N.; and  
 White, B.  
 Wind Tunnel Studies of Martian Aeolian Processes. May 1973.  
 NASA TM-X-62297 N73-31746
506. Hartle, R. E.; and Barnes, A.  
 Model for Energy Transfer in the Solar Wind: Formulation of Model.  
In Solar Wind; Proceedings of a Conference Held at Pacific Grove,  
 Calif., 21-26 Mar., 1971. Sonett, C. P., Coleman, P. J., Jr. and  
 Wilcox, J. M., Editors. 1972. p. 248-251.  
 NASA SP-308 N73-10782
507. Hirshberg, J.  
 Solar Wind Helium Enhancements Following Major Solar Flares. In  
 Solar Wind; Proceedings of a Conference Held at Pacific Grove,  
 Calif., 21-26 Mar., 1971. Sonett, C. P., Coleman, P. J., Jr. and  
 Wilcox, J. M., Editors. 1972. p. 582-587.  
 NASA SP-308 N73-10808
508. Iversen, J. D.; Greeley, R.; Pollack, J. B.; and White, B. R.  
 Simulation of Martian and Eolian Phenomena in the Atmospheric Wind  
 Tunnel. In Conference on Space Simulation, 7th, Los Angeles, Calif.,  
 12-14 Nov., 1973. Proceedings of a Symposium. 1973. p. 191-213.  
 NASA SP-336 N74-10247
509. Mandeville, J.-C.; and Vedder, J. F.  
 Microcraters Formed in Glass by Low Density Projectiles. 1971.  
 NASA TM-X-67469 N72-13497  
 (Also published as NASA TM-X-68301)
510. Mihalov, J. D.  
 Distant Bow Shock Observations by Explorer 33. Sept. 1973.  
 NASA TM-X-62313 N74-10776
511. Mihalov, J. D.; and Sonett, C. P.  
 Lunar Fossil Magnetism and Perturbations of the Solar Wind. June 1971.  
 NASA TM-X-62026 N71-28024
512. Mihalov, J. D.; Colburn, D. S.; Smith, B. F.; Sonett, C. P.; and  
 Wolfe, J. H.  
 Pioneer Solar Plasma and Magnetic Field Measurements in Interplanetary  
 Space during 2-17 August 1972. May 1973.  
 NASA TM-X-62291 N73-27719



513. Mulholland, D. R.; Reller, J. O., Jr.; Neel, C. B., Jr.; and Mason, R. H.  
Shuttle Sortie Simulation using a Lear Jet Aircraft: Mission No. 1  
(Assess Program). Dec. 1972. N73-29868  
NASA TM-X-62283
514. Mulholland, D. R.; Reller, J. O., Jr.; Neel, C. B.; and Haughney, L. C.  
Study of Airborne Science Experiment Management Concepts for Application  
to Space Shuttle. Vol. 1. Executive Summary. July 1973. N74-13570  
NASA TM-X-62288
515. Mulholland, D. R.; Reller, J. O., Jr.; Neel, C. B.; and Haughney, L. C.  
Study of Airborne Science Experiment Management Concepts for Applica-  
tion to Space Shuttle. Vol. 2. July 1973. N73-31729  
NASA TM-X-62287
516. Mulholland, D. R.; Reller, J. O., Jr.; Neel, C. B.; and Haughney, L. C.  
Study of Airborne Science Experiment Management Concepts for Applica-  
tion to Space Shuttle. Vol. 3. Appendixes. Aug. 1973. N74-10783  
NASA TM-X-62289
517. Oberbeck, V. R.; Hörz, F.; Morrison, R. H.; and Quaide, W. L.  
Emplacement of the Cayley Formation. Sept. 1973. N73-30804  
NASA TM-X-62302
518. Oberbeck, V. R.  
Implications of Regolith Thickness in the Apollo 16 Landing Site.  
Oct. 1971. N71-37424  
NASA TM-X-62089
519. Oberbeck, V. R.; and Morrison, R. H.  
The Lunar Herringbone Pattern. In NASA. Lyndon B. Johnson Space Center,  
Houston, Tex. Apollo 17 Preliminary Science Report. 1973. p. 32-15 -  
32-29. N74-18477  
NASA SP-330
520. Oberbeck, V. R.; Greeley, R.; Morgan, R. B.; and Lovas, M. J.  
Lunar Rilles: A Catalog and Method of Classification. Nov. 1971. N72-13832  
NASA TM-X-62088
521. Oberbeck, V. R.; Morrison, R. H.; and Wedekind, J.  
Lunar Secondary Craters. In NASA. Lyndon B. Johnson Space Center,  
Houston, Tex. Apollo 16 Preliminary Science Report. 1972. p. 29-51 -  
29-56. N73-21775  
NASA SP-315

522. Oberbeck, V. R.; Aoyagi, M; Greeley, R.; and Lovas, M.  
 Planimetric Shapes of Lunar Rilles. In NASA. Lyndon B. Johnson  
 Space Center, Houston Tex. Apollo 16 Preliminary Science Report.  
 1972. p. 29-80 - 29-88.  
 NASA SP-315 N73-21781
523. Parkin, C. W.; Dyal. P.; and Daily, W. D.  
 Iron Abundance in the Moon from Magnetometer Measurements. Apr.  
 1973.  
 NASA TM-X-62279 N73-26841
524. Phillips, R. J.; Adams, G. F.; Brown, W. E., Jr.; Eggleton, R. E.;  
 Jackson, P.; Jordan, R.; Linlor, W. I.; Peeples, W. J.; Porcello,  
 L. J.; Ryu, J.; Schaber, G.; Sill, W. R.; Thompson, T. W.; Ward,  
 S. H.; and Zelenka, J. S.  
 Apollo Lunar Sounder Experiment. In NASA. Lyndon B. Johnson Space  
 Center, Houston, Tex. Apollo 17 Preliminary Science Report.  
 1973. p. 22-1 - 22-26.  
 NASA SP-330 N74-18454
525. Poppoff, I. G.  
 Ames Research Center SR&T Program and Earth Observations. In Earth  
 Resources Program. 4th Annual Review, Jan. 21, 1972. Vol. 1.  
 National Aeronautics and Space Administration Programs. 1972.  
 NASA TM-X-68564 N72-29303
526. Reller, J. O., Jr.  
 Design and Performance of the Ames Electric-Arc Shock Tunnel. June  
 1973.  
 NASA TM-X-2814 N73-25258
527. Rodsen, R. G.; Berg, O. E.; and Farlow, N. H.  
 Dust Storms in Space? In Hemenway, C. L.; Millman, P. M. and Cook,  
 A. F., Editors. Evolutionary and Physical Properties of Meteoroids;  
 Proceedings of the International Astronomical Union's Colloquium,  
 no. 13, Held at the State University of New York, Albany, N. Y.,  
 June 14-17, 1971. p. 223-226.  
 NASA SP-319 N74-19457
528. Savage, H. F.; and Boitnott, C. A.  
 Laboratory Determination of the Luminous Efficiency of Meteor Consti-  
 tuents. In Hemenway, C. L., Millman, P. M. and Cook, A. F., Editors.  
 Evolutionary and Physical Properties of Meteoroids; Proceedings of  
 the International Astronomical Union's Colloquium, no. 13, Albany, N. Y.,  
 June 14-17, 1971. p. 83-87.  
 NASA SP-319 N74-19443
529. Schultz, P. H.; and Ingerson, F. E.  
 Martian Lineaments from Mariner 6 and 7 Photographs. Apr. 1973.  
 NASA TM-X-62264. N73-23817

530. Warner, R. W.; and Wilcox, P. R.  
Hypersonic and Transonic Buzz Measurements on the Lower Pitch Flap  
of the M2-F2 Lifting Entry Configuration. May 1972.  
NASA TN-D-6799 N72-22006
531. Warner, R. W.; Wilcox, P. R.; and Gambucci, B. J.  
Initial Rotation-Loading and Low Speed Flutter Test Results for a  
Straight Wing Version of the Space Shuttle Vehicle. Jan. 1972.  
NASA TM-X-62110 N72-15940
532. Wilcox, P. R.  
Calculation of Stress Concentration due to a Hyperboloid Cavity in a  
Thin Plate Using NASTRAN. In NASTRAN: Users' Experiences, Langley  
Research Center, Langley Station, Va., Sept. 13-15, 1971. p. 9-16.  
NASA TM-X-2378 N71-36255
533. Wilcox, J. M.; and Colburn, D. S.  
Interplanetary Sector Structure at Solar Maximum. June 6, 1971.  
NASA TM-X-67601 N72-15735
534. Witteborn, F. S.  
Infrared Telescopes for a Space Observatory. In European Space  
Research Organization, Paris. The Implications for European Space  
Programmes of the Possibilities of Manned Missions. Part 2. UV,  
Visible Astronomy, Infrared Astronomy. Proceedings of the ESRO  
Summer School, 1973. 1973.  
N74-33345
535. Wolfe, J. H.  
The Large-Scale Structure of the Solar Wind. In Solar Wind;  
Proceedings of a Conference Held at Pacific Grove, Calif., 21-26  
Mar., 1971. Sonett, C. P., Coleman, P. J., Jr. and Wilcox, J. M.,  
Editors. 1972. p. 170-201.  
NASA SP-308 N73-10774

#### NASA CONTRACTOR REPORTS

536. Briggs, G. A.; Cutts, J. A.; Steinbacher, R. H.; Thorpe, T. E.;  
Whitehead, A. B.; DeVaucouleurs, G.; Davies, M. E.; Masursky, H.;  
and Pollack, J. B.  
Television Experiment. In Jet Propulsion Laboratory, California  
Institute of Technology, Pasadena, Calif. Mariner Mars 1971 Project.  
Vol. 5. Science Experiment Reports; Final Report. p. 63-70. (JPL-  
TR-32-1550-VOL-5, Jet Propulsion Lab., Calif. Inst. of Tech., Pasadena;  
NAS7-100.) Aug. 20, 1973.  
NASA CR-135726 N73-33841

537. Hertel, R.; and Holm, M.  
Counter Tube Window and X-Ray Fluorescence Analyzer Study. (UMC-1116-FR, Universal Monitor Corp., Pasadena; NAS2-7356.) Mar. 20, 1973.  
NASA CR-114619 N73-24484
538. Hornig, A. W.; and Eastwood, D.  
Compendium of Marine Luminescence Signatures, Part 2 (Appendix C). (Baird-Atomic, Inc., Bedford, Mass.; NAS2-6408.) Mar. 1973.  
NASA CR-114579 N73-25115
539. Hornig, A. W.; and Eastwood D.  
A Study of Marine Luminescence Signatures, Part 1. Final Report. (Baird-Atomic, Inc., Bedford, Mass; NAS2-6408.) Mar. 1973.  
NASA CR-114578 N73-25114
540. Mende, S. B.; and Eather, R. H.  
Airborne Auroral Data and Satellite Data Analysis. Final Report. (Lockheed Missiles and Space Co., Palo Alto, Calif.; NAS2-6299.) Oct. 1971.  
NASA CR-114379 N72-14363
541. Mende, S. B.  
Analysis of Data of the 1968-1969 Airborne Auroral Expeditions. Final Report. (Lockheed Missiles and Space Co., Palo Alto, Calif.; NAS2-7296.) Mar. 1973.  
NASA CR-114616 N73-24409
542. Mihalov, J. D.  
Assessment of Jupiter's Trapped Radiation by Pioneer. In Jupiter Radiation Belt Workshop, Jet Propulsion Laboratory, Pasadena, Calif., 13-15, July, 1971. Proceedings. Beck, A. J., Jr., Editor. July 1972. p. 445-472. (JPL-TM-33-543, Jet Propulsion Lab., Calif. Inst. of Tech., Pasadena; NAS7-100.)  
NASA CR-127124 N72-27872
543. Nielsen, J. N.; Stahara, S. S.; and Woolley, J. P.  
A Study of Ingestion and Dispersion of Engine Exhaust Products in Trailing Vortex Systems. (NEAR-TR-54, Nielsen Engineering and Research, Inc., Mountain View, Calif.; NAS2-7337.) Nov. 1973.  
NASA CR-114721 N74-16497
544. Pollack, J. B; Veverka, J.; Noland, M.; Sagan, C.; Duxbury, T. C.; Acton, C. H., Jr.; Born, G. H.; Hartmann, W. K.; and Smith, B. A.  
Mariner 9 Television Observations of Phobos and Deimos 2. In Jet Propulsion Laboratory, California Institute of Technology, Pasadena, Calif. Mariner Mars 1971 Project. Vol. 4. Science Results. p. 373-388. (JPL-TR-32-1550-VOL-4, Jet Propulsion Lab., Calif. Inst. of Tech., Pasadena; NAS7-100.) July 15, 1973.  
NASA CR-135530 N73-32705

545. Schubert, G.; and Schwartz, K.  
High Frequency Electromagnetic Response of the Moon. (California Univ., Los Angeles; NAS2-5876.) Nov. 1971.  
NASA CR-114385 N72-12821

JOURNAL ARTICLES, MEETING PAPERS, BOOKS AND CHAPTERS OF BOOKS

546. Aggarwal, H. R.; and Ablow, C. M.  
Plastic Bending of an Annular Plate by Uniform Impulse. International Journal of Non-Linear Mechanics, vol. 6, Feb. 1971, p. 69-80.
547. Aggarwal, H. R.  
Rayleigh Wave Effects in an Elastic Half-Space. AIAA Journal, vol. 10, Aug. 1972, p. 1086-1088.
548. Anderson, D. L.; Cunningham, B. E.; and Dahms, R. G.  
Radiation Degradation Analysis of Surveyor III Material. Progress in Astronautics and Aeronautics, vol. 29, 1972, p. 205-220.
549. Arvesen, J. C.; Millard, J. P.; and Weaver, E. C.  
Remote Sensing of Chlorophyll and Temperature in Marine and Fresh Waters. Astronautica Acta, vol. 18, June 1973, p. 229-239.
550. Aubry, M. P.; Kivelson, M. G.; McPherron, R. L.; Russell, C. T.; and Colburn, D. S.  
Outer Magnetosphere Near Midnight at Quiet and Disturbed Times. Journal of Geophysical Research, vol. 77, Oct. 1, 1972, p. 5487-5502.
551. Bader, M.; and Worden, A. M.  
Experimental Payloads: Inception to Integration. In Space Shuttle Payloads; Proceedings of the Symposium, Washington, D. C., December 27-28, 1972. Morgenthaler, G. W.; and Bursnall, W. J., Editors. Tarzana, Calif., American Astronautical Society, 1973. p. 45-53. (AAS Science and Technology Series, vol. 30)
552. Bader, M.; and Farlow, N. H.  
Potential Reductions in Cost and Response Time for Shuttleborne Space Experiments. American Inst. of Aeronautics and Astronautics. Space Systems Meeting, Denver, Colo., Jul. 19-20, 1971. AIAA Paper 71-808.
553. Barnes, A.; and Scargle, J. D.  
Collisionless Damping of Hydromagnetic Waves in Relativistic Plasma. I. Weak Landau Damping; Heating of the Crab Nebula. Astrophysical Journal, vol. 184, Aug. 15, 1973, p. 251-270.
554. Barnes, A.; and Hung, R. J.  
On the Kinetic Temperature of He<sup>++</sup> in the Solar Wind. Cosmic Electrodynamics, vol. 3, Jan. 1973, p. 416-436.

555. Barnes, A.; and Hung, R. J.  
Plasma Heating and Acceleration due to Landau Damping of Hydromagnetic Waves. *Journal of Plasma Physics*, vol. 8, Oct. 1972, p. 197-215.
556. Barnes, A.; and Suffolk, G. C. J.  
Relativistic Kinetic Theory of the Large-Amplitude Transverse Alfvén Wave. *Journal of Plasma Physics*, vol. 5, June 1971, p. 315-329.
557. Barnes, A.  
Theoretical Constraints on the Microscale Fluctuations in the Interplanetary Medium. *Journal of Geophysical Research*, vol. 76, Nov. 1, 1971, p. 7522-7526.
558. Baum, P. J.; and Pollack, J.  
Admittance Probe Measurements in the Double Inverse Pinch Device. *Journal of Applied Physics*, vol. 44, Jan. 1973, p. 163-167.
559. Black, D. C.  
The A, B, C's of Trapped Helium, Neon, and Argon in Meteorites and Lunar Samples. *In The Origin of the Solar System; Symposium, Nice, France, Apr. 3-7, 1972. Proceedings.* Reeves, H., Editor. Paris, Centre National de la Recherche Scientifique, 1972. p. 237-241; Discussion, p. 241-244.
560. Black, D. C.; and Suffolk, G. C. J.  
Concerning the Planetary System of Barnard's Star. *Icarus*, vol. 19, July 1973, p. 353-357.
561. Black, D. C.  
Deuterium in the Early Solar System. *Icarus*, vol. 19, May 1973, p. 154-159.
562. Black, D. C.  
On the Equivalence of the Planet-Satellite Formation Processes. *Icarus*, vol. 15, Aug. 1971, p. 115-119.
563. Black, D. C.  
On the Origins of Trapped Helium, Neon and Argon Isotopic Variations in Meteorites - I. Gas-Rich Meteorites, Lunar Soil and Breccia. *Geochimica et Cosmochimica Acta*, vol. 36, March 1972. p. 347-375.
564. Black, D. C.  
On the Origins of Trapped Helium, Neon and Argon Isotopic Variations in Meteorites - II. Carbonaceous Meteorites. *Geochimica et Cosmochimica Acta*, vol. 36, March 1972, p. 377-394.
565. Black, D. C.; and Suffolk, G. C. J.  
Perturbing Aspects of the Companions of Barnard's Star. *In The Origin of the Solar System; Symposium, Nice, France, Apr. 3-7, 1972. Proceedings.* Reeves, H., Editor. Paris, Centre National de la Recherche Scientifique, 1972. p. 336-338.

566. Black, D. C.  
Some Implications of a New Value for the Primordial Solar Deuterium-Hydrogen Ratio. *Nature: Physical Science*, vol. 234, Dec. 20, 1971, p. 148-149.
567. Blanchard, M. B.  
Artificial Meteor Ablation Studies: Iron Oxides. *Journal of Geophysical Research*, vol. 77, May 10, 1972, p. 2442-2455.
568. Blanchard, M. B.; Farlow, N. H.; and Ferry, G. V.  
Methods of Analyzing Microsize Particulate Aerosols and Contaminants. ACS, AIAA, EPA, IEEE, ISA, NASA, and NOAA, Joint Conference on Sensing of Environmental Pollutants, Palo Alto, Calif., Nov. 8-10, 1971. AIAA Paper 71-1104.
569. Brownlee, D. E.; Hörz, F.; Hartung, J. B.; and Gault, D. E.  
Micrometeoroid Craters Smaller than 100 Microns. *In* The Apollo 15 Lunar Samples. Chamberlain, J. W. and Watkins, C., Editors. Houston, Tex., Lunar Science Institute, 1972. p. 407-411.
570. Brownlee, D. E.; Hörz, F.; Vedder, J. F.; Gault, D. E.; and Hartung, J. B.  
Some Physical Parameters of Micrometeoroids. *In* Lunar Science Conference, 4th, Houston, Tex., Mar. 5-8, 1973. Proceedings. New York, Pergamon Press, Inc., 1973. Vol. 3, p. 3197-3212.
571. Bunch, T. E.; and Okrusch, M.  
Al-Rich Pargasite. *The American Mineralogist*, vol. 58, July-Aug. 1973, p. 721-726.
572. Bunch, T. E.; and Keil, K.  
Contributions to Mineral Chemistry of Hawaiian Rocks; I. Gabbroic Pegmatoid Dike Segregations in Wainanae Range, Oahu, Hawaii. *Contributions to Mineralogy and Petrology*, vol. 31, 1971, p. 267-274.
573. Bunch, T. E.; Prinz, M.; and Keil, K.  
Electron Microprobe Analyses of Lithic Fragments and Glasses from Apollo 12 Lunar Samples. New Mexico University. Institute of Meteoritics. Special Publication, no. 4, 1972.
574. Bunch, T. E.; Keil, K.; and Huss, G. I.  
The Landes Meteorite. *Meteoritics*, vol. 7, Mar. 30, 1972, p. 31-38.
575. Bunch, T. E.; Quaide, W.; Prinz, M.; Keil, K.; and Dowty, E.  
Lunar Ultramafic Glasses, Chondrules and Rocks. *Nature: Physical Science*, vol. 239, Sept. 25, 1972, p. 57-59.
576. Bunch, T. E.; Keil, K.; and Prinz, M.  
Mineralogy, Petrology and Chemistry of Lunar Rock 12039. *Meteoritics*, vol. 7, Sept. 30, 1972, p. 245-255.

577. Bunch, T. E.; and Cassidy, W. A.  
Petrographic and Electron Microprobe Study of the Monturaqui Impactite.  
Contributions to Mineralogy and Petrology, vol. 36, 1972, p. 95-112.
578. Bunch, T. E.; Mall, A. P.; and Lewis, C. F.  
The Seoni Chondrite. Meteoritics, vol. 7, June 30, 1972, p. 87-95.
579. Burke, W. J.; Rich, F. J.; Reasoner, D. L.; Colburn, D. S.; and  
Goldstein, B. E.  
Effects on the Geomagnetic Tail at 60  $R_E$  of the Geomagnetic Storm of  
April 9, 1971. Journal of Geophysical Research, vol. 78, Sept. 1,  
1973, p. 5477-5489.
580. Busche, F. D.; Conrad, G. H.; Keil, K.; Prinz, M.; Bunch, T. E.;  
Erichman, J.; and Quaide, W. L.  
Electron Microprobe Analyses of Minerals from Apollo 12 Lunar Samples.  
New Mexico University. Institute of Meteoritics. Special Publication,  
no. 3, 1971.
581. Busche, F. D.; Prinz, M.; Keil, K.; and Bunch, T. E.  
Spinel and the Petrogenesis of Some Apollo 12 Igneous Rocks. American  
Mineralogist, vol. 57, 1972, p. 1729-1747.
582. Buti, B.  
Effects of Solar Wind Composition, Anisotropy, and Streaming on  
Ordinary Mode Electromagnetic Instability. Journal of Geophysical  
Research, vol. 78, Dec. 1, 1973, p. 8023-8031.
583. Buti, B.; and Lakhina, G. S.  
Electromagnetic Instabilities in Non-Uniform Anisotropic Plasmas.  
Journal of Plasma Physics, vol. 10, Oct. 1973, p. 249-263.
584. Buti, B.  
Stability of Solar Wind Against Electromagnetic Streaming Instability.  
Astrophysical Journal, vol. 181, May 1, 1973, p. 1055-1063.
585. Cameron, R. M.; Bader, M.; and Mobley, R. E.  
Design and Operation of the NASA 91.5-cm Airborne Telescope. Applied  
Optics, vol. 10, Sept. 1971, p. 2011-2015.
586. Caroff, L. J.; Petrosian, V.; Salpeter, E. E.; Wagoner, R. V.; and  
Werner, M. W.  
Interpretation of Far Infra-Red Emission from Interstellar Grains.  
Royal Astronomical Society. Monthly Notices, vol. 164, 1973, p. 295-  
302.
587. Caroff, L. J.; Noerdlinger, P. D.; and Scargle, J. D.  
Transfer of Resonance-Line Radiation in Differentially Expanding  
Atmospheres. I. General Considerations and Monte Carlo Calculations.  
Astrophysical Journal, vol. 176, Sept. 1, 1972, p. 439-461.



588. Case, L. A.  
Relativistic Runaway from Collapsed Matter. *Astrophysical Journal*,  
vol. 173, May 1, 1972, p. 665-669.
589. Cassen, P.; and Reynolds, R. T.  
Role of Convection in the Moon. *Journal of Geophysical Research*,  
vol. 78, June 10, 1973, p. 3203-3215.
590. Chackerian, C., Jr.; and Weisbach, M. F.  
Amplified Laser Absorption: Detection of Nitric Oxide. *Optical  
Society of America. Journal*, vol. 63, Mar. 1973, p. 342-345.
591. Chackerian, C., Jr.; and Weisbach, M. F.  
Relaxation of the  $V = 4,5,6,7, \Sigma_g^+$  Vibrational Levels of Carbon  
Monoxide Studied by Laser Absorption. *Journal of Chemical Physics*,  
vol. 59, July 15, 1973, p. 807-811.
592. Chackerian, C., Jr.  
Vibrational Relaxation of Carbon Monoxide Studied by Two-Wavelength  
Infrared Emission. *AIAA Journal*, vol. 11, Dec. 1973, p. 1706-1710.
593. Chow, T. L.; and Caroff, L.  
White Dwarfs as Infrared Sources in the Galactic Centre. *Journal of  
Physics A: Mathematical, Nuclear and General*, vol. 6, Aug. 1973,  
p. 1285-1288.
594. Colburn, D. S.  
Lunar Magnetic Field Measurements, Electrical Conductivity Calculations  
and Thermal Profile Inferences. *In The Moon; Proceedings of the 2nd  
Symposium, Newcastle-Upon-Tyne, England, Mar. 22-26, 1971.* Runcorn,  
S. K.; and Urey, H. C., Editors. Dordrecht, D. Reidel Publishing Co.,  
1972. p. 355-371.
595. Colburn, D. S.; Sonett, C. P.; and Schwartz, K.  
Unipolar Interaction of Mercury with the Solar Wind; The Steady State  
Bow Shock Problem. *Earth and Planetary Science Letters*, vol. 14,  
Apr. 1972, p. 325-337.
596. Conrad, G. H.; Hlava, P. F.; Green, J. A.; Moore, R. B.; Moreland, G.;  
Dowty, E.; Prinz, M.; Keil, K.; Nehru, C. E.; and Bunch, T. E.  
Electron Microprobe Analyses of Lithic Fragments and Their Minerals  
from Luna 20 Fines. New Mexico University. *Institute of Meteoritics.*  
Special Publication, no. 12, 1973.
597. Daily, W. D.  
Alfvén Wave Refraction by Interplanetary Inhomogeneities. *Journal of  
Geophysical Research*, vol. 78, May 1, 1973, p. 2043-2053.  
(Also published as NASA TM-X-62270, May 1973)

598. Dryer, M.; Smith, Z. K.; Endrud, G. H.; and Wolfe, J. H.  
Pioneer 7 Observations of the August 29, 1966, Interplanetary Shock-  
Wave Ensemble. *Cosmic Electrodynamics*, vol. 3, July 1972, p. 184-  
207.
599. Dubach, J.; and Barker, W. A.  
Charged Particle Induced Ionization Rates in Planetary Atmospheres.  
*Journal of Atmospheric and Terrestrial Physics*, vol. 33, Aug. 1971,  
p. 1287-1288.
600. Dyal, P.; and Parkin, C. W.  
The Apollo 12 Magnetometer Experiment: Internal Lunar Properties  
from Transient and Steady Magnetic Field Measurements. In *Lunar  
Science Conference, 2nd, Houston, Tex., Jan. 11-14, 1971. Proceed-  
ings. Cambridge, Mass., MIT Press, 1971. Vol. 3. p. 2391-2413.*
601. Dyal, P.; and Parkin, C. W.  
Electrical Conductivity and Temperature of the Lunar Interior from  
Magnetic Transient-Response Measurements. *Journal of Geophysical  
Research*, vol. 76, Sept. 1, 1971, p. 5947-5969.  
(Also published as NASA TM-X-62012)
602. Dyal, P.; and Parkin, C. W.  
Global Electromagnetic Induction in the Moon and Planets. *Physics  
of the Earth and Planetary Interiors*, vol. 7, Sept. 1973, p. 251-265.
603. Dyal, P.; and Parkin, C. W.  
Lunar Properties from Transient and Steady Magnetic Field Measurements.  
*The Moon*, vol. 4, Apr. 1972, p. 63-87.
604. Dyal, P.; and Gordon, D. I.  
Lunar Surface Magnetometers. *IEEE Transactions on Magnetism*, vol.  
MAG-9, Sept. 1973, p. 226-231.
605. Dyal, P.; and Parkin, C. W.  
The Magnetism of the Moon. *Scientific American*, vol. 225, Aug. 1971,  
p. 62-73.
606. Dyal, P.; Parkin, C. W.; Snyder, C. W.; and Clay, D. R.  
Measurements of Lunar Magnetic Field Interaction with the Solar Wind.  
*Nature*, vol. 236, Apr. 21, 1972, p. 381-385.
607. Dyal, P.; Parkin, C. W.; and Cassen, P.  
Surface Magnetometer Experiments - Internal Lunar Properties and  
Lunar Field Interactions with the Solar Plasma. In *Lunar Science  
Conference, 3rd, Houston, Tex., Jan. 10-13, 1972. Proceedings.  
Cambridge, Mass., MIT Press, 1972. Vol. 3, p. 2287-2307.*

608. Dyal, P.; Parkin, C. W.; and Daily, W. D.  
Surface Magnetometer Experiments: Internal Lunar Properties. In  
Lunar Science Conference, 4th, Houston, Tex., Mar. 5-8, 1973. Proceed-  
ings. New York, Pergamon Press, Inc., 1973. Vol. 3, p. 2925-2945.
609. Edmonds, J. D. Jr.  
A Four-Component Hypermass Equation Possibly Applying to Unstable  
Neutrinos. *Nuovo Cimento, Lettere*, vol. 5, Oct. 14, 1972, p. 572-  
574.
610. Edmonds, J. D., Jr.  
Generalized Charge in the Eight-Component Spin- $\frac{1}{2}$  Wave Equation.  
*Foundations of Physics*, vol. 3, Sept. 1973, p. 313-319.
611. Edmonds, J. D., Jr.  
Hypermass Generalization of Einstein's Gravitation Theory. *International*  
*Journal of Theoretical Physics*, vol. 7, 1973, p. 475-482.
612. Ehler, W.; and Linlor, W. I.  
Origin of "Energetic" Ions from Laser-Produced Plasmas. *Journal of*  
*Applied Physics*, vol. 44, Sept. 1973, p. 4229-4231.
613. Erickson, E. F.; Swift, C. D.; Witteborn, F. C.; Mord, A. J.;  
Augason, G. C.; Caroff, L. J.; Kunz, L. W.; and Giver, L. P.  
Infrared Spectrum of the Orion Nebula between 55 and 200 Microns.  
*Astrophysical Journal*, vol. 183, July 15, 1973, p. 535-539.
614. Farlow, N. H.; Ferry, G. V.; and Lem, H. Y.  
Analysis of Individual Particles Collected from the Stratosphere.  
*Space Research, XIII; Proceedings of Open Meetings of Working*  
*Groups on Physical Sciences of the 15th Plenary Meeting of COSPAR,*  
*Madrid, 10-24 May, 1972. Berlin, Akademie-Verlag, 1973. p. 1153-*  
*1157.*
615. Farlow, N. H.; and Ferry, G. V.  
Cosmic Dust in the Mesosphere. In *Space Research XII; Proceedings*  
*of the 14th Plenary Meeting, Seattle, Wash., June 18-July 2, 1971.*  
*Berlin, East Germany, Akademie-Verlag GMBH, 1972. Vol. 1, p. 369-380.*
616. Farlow, N. H.; and Lem, H. Y.  
X Ray Analysis of Balloon-Collected Particles Erroneously Considered  
as an October Influx into the Lower Stratosphere. *Journal of Geo-*  
*physical Research*, vol. 78, Nov. 20, 1973, p. 7923-7927.
617. Ferry, G. V.; and Farlow, N. H.  
Upper Atmospheric Dust Concentrations in Polar Regions. In *Space*  
*Research XII; Proceedings of the 14th Plenary Meeting, Seattle, Wash.,*  
*June 18-July 2, 1971. Berlin, East Germany, Akademie-Verlag GMBH,*  
*1972. Vol. 1, p. 381-390.*

618. Fricker, P. E.; Reynolds, R. T.; and Summers, A. L.  
Possible Thermal History of the Moon. In The Moon: Proceedings of the Second Symposium, Newcastle-Upon-Tyne, England, Mar. 22-26, 1971. Runcorn, S. K.; and Urey, H. C., Editors. Dordrecht, D. Reidel Publishing Co., 1972. p. 384-391.
619. Friis-Christensen, E.; Lassen, K.; Wilhjelm, J.; Wilcox, J. M.; Gonzalez, W.; and Colburn, D. S.  
Critical Component of the Interplanetary Magnetic Field Responsible for Large Geomagnetic Effects in the Polar Cap. Journal of Geophysical Research, vol. 77, July 1, 1972, p. 3371-3376.
620. Friis-Christensen, E.; Lassen, K.; Wilcox, J. M.; Gonzalez, W.; and Colburn, D. S.  
Interplanetary Magnetic Sector Polarity from Polar Geomagnetic Field Observations. Nature: Physical Science, vol. 233, Sept. 20, 1971, p. 48-50.  
(Also published in the Danish Meteorological Institute, Charlottenlund, Denmark. Geophysical Papers, R-26, 1971 (NASA TM-X-67650), and as NASA TM-X-67438, NASA TM-X-67518, and NASA TM-X-67602)
621. Gault, D. E.; Hörz, F.; and Hartung, J. B.  
Abrasion and Catastrophic Rupture of Lunar Rocks - Some Implications to the Micrometeoroid Flux at 1 AU. Space Research, XIII. Proceedings of the Open Meetings of Working Groups on Physical Sciences of the 15th Plenary Meeting of COSPAR, Madrid, Spain, May 10-24, 1972. Berlin, Akademie-Verlag, 1972. p. 1085-1094.
622. Gault, D. E.  
Displaced Mass, Depth, Diameter, and Effects of Oblique Trajectories for Impact Craters Formed in Dense Crystalline Rocks. The Moon, vol. 6, Jan.-Feb. 1973, p. 32-44.
623. Gault, D. E.; Hörz, F.; and Hartung, J. B.  
Effects of Microcratering on the Lunar Surface. In Lunar Science Conference, 3rd, Houston, Tex., Jan. 10-13, 1972. Proceedings. Cambridge, Mass., MIT Press, 1972. Vol. 3, p. 2713-2734.
624. Greeley, R.  
Additional Observations of Actively Forming Lava Tubes and Associated Structures, Hawaii. Modern Geology, vol. 3, 1972, p. 157-160.
625. Greeley, R.; and Gault, D. E.  
Crater Frequency Age Determinations for the Proposed Apollo 17 Site at Taurus-Littrow. Earth and Planetary Science Letters, vol. 18, Feb. 1973, p. 102-108.
626. Greeley, R.  
Geology of Selected Lava Tubes in the Bend Area, Oregon. Oregon. Dept. of Geology and Mineral Industries. Bulletin, no. 71, 1971.  
(Also published as NASA TM-X-67438)

627. Greeley, R.  
Lava Tubes and Channels in the Lunar Marius Hills. *The Moon*, vol. 3,  
Dec. 1971, p. 289-314.
628. Greeley, R.; and Hyde, J. H.  
Lava Tubes of the Cave Basalt, Mount St. Helens, Washington. *Geo-  
logical Society of America. Bulletin*, vol. 83, Aug. 1972, p. 2397-  
2418.  
(Also published as NASA TM-X-62022)
629. Greeley, R.  
Mariner 9 Photographs of Small Volcanic Structures on Mars. *Geology*,  
Dec. 1973, p. 175-180.  
(Also published as NASA TM-X-62222)
630. Greeley, R.  
Note on the Occurrence of Dribblet Spires in the Snake River Plain,  
Idaho. *Northwest Science*, vol. 45, 1971, p. 145-148.
631. Grossman, A. S.; Graboske, H.; Pollack, J.; Reynolds, K.; and  
Summers, A.  
An Evolutionary Calculation of Jupiter. *Physics of the Earth and  
Planetary Interiors*, vol. 6, Dec. 1972, p. 91-98.  
(Also published in Runkorn, S. K., Editor. *High Pressure Physics and  
Planetary Interiors*. Amsterdam, North-Holland Publ. Co., 1972. p. 91-  
98)
632. Hartung, J. B.; Hörz, F.; Aitken, F. K.; Gault, D. E.; and Brownlee,  
D. E.  
The Development of Microcrater Populations on Lunar Rocks. *In Lunar  
Science Conference, 4th, Houston, Tex., Mar. 5-8, 1973. Proceedings*.  
New York, Pergamon Press, Inc., 1973. Vol. 3, p. 3213-3234.
633. Hartung, J. B.; Hörz, F.; and Gault, D. E.  
Lunar Microcraters and Interplanetary Dust. *In Lunar Science  
Conference, 3rd, Houston, Tex., Jan. 10-13, 1972. Proceedings*.  
New York, Pergamon Press, 1972. Vol. 3, p. 2735-2753.
634. Hirshberg, J.; and Colburn, D. S.  
Geomagnetic Activity at Sector Boundaries. *Journal of Geophysical  
Research*, vol. 78, July 1, 1973, p. 3952-3957.
635. Hirshberg, J.  
Helium Abundance of the Sun. *Reviews of Geophysics and Space Physics*,  
vol. 11, Feb. 1973, p. 115-131.
636. Hirshberg, J.; Bame, S. J.; and Robbins, D. E.  
Solar Flares and Solar Wind Helium Enrichments - July 1965-July 1967.  
*Solar Physics*, vol. 23, Apr. 1972, p. 467-486.

637. Hirshberg, J.  
The Solar Wind Cycle, the Sunspot Cycle, and the Corona. *Astrophysics and Space Science*, vol. 20, Feb. 1973, p. 473-481.
638. Hirshberg, J.  
Upper Limit of the Torque of the Solar Wind on the Earth. *Journal of Geophysical Research*, vol. 77, Sept. 1, 1972, p. 4855-4857.
639. Hirshberg, J.; Asbridge, J. R.; and Robbins, D. E.  
Velocity and Flux Dependence of the Solar-Wind Helium Abundance. *Journal of Geophysical Research*, vol. 77, July 1, 1972, p. 3583-3588.
640. Hlava, P. F.; Green, J. A.; Prinz, M.; Nehru, C. E.; Keil, K.; Dowty, E.; and Bunch, T. E.  
Apollo 15 Rake Sample Microbreccias and Non-Mare Rocks: Bulk Rock, Mineral and Glass Electron Microprobe Analyses. New Mexico University. Institute of Meteoritics. Special Publication, no. 11, 1973.  
(Also published as NASA TM-X-70079)
641. Hörz, F.; and Quaide, W. L.  
Debye-Scherrer Investigations of Experimentally Shocked Silicates. *The Moon*, vol. 6, Jan.-Feb. 1973, p. 45-82.
642. Hörz, F.; Hartung, J. B.; and Gault, D. E.  
Micrometeorite Craters and Related Features on Lunar Rock Surfaces. *Earth and Planetary Science Letters*, vol. 10, Mar. 1971, p. 381-386.
643. Hörz, F.; Hartung, J. B.; and Gault, D. F.  
Micrometeorite Craters on Lunar Rock Surfaces. *Journal of Geophysical Research*, vol. 76, Aug. 10, 1971, p. 5770-5798.
644. Houck, J. R.; Pollack, J. B.; Sagan, C.; Schaack, D.; and Decker, J. A., Jr.  
High Altitude Infrared Spectroscopic Evidence for Bound Water on Mars. *Icarus*, vol. 18, Mar. 1973, p. 470-480.
645. Hung, R. J.; and Barnes, A.  
Dissipation of Hydromagnetic Waves with Application to the Outer Solar Corona. I. Collisionless Protons and Collisional Electrons. *Astrophysical Journal*, vol. 180, Feb. 15, 1973, p. 253-269.
646. Hung, R. J.; and Barnes, A.  
Dissipation of Hydromagnetic Waves with Application to the Outer Solar Corona. II. Transition from Collisional to Collisionless Electrons. *Astrophysical Journal*, vol. 180, Feb. 15, 1973, p. 271-284.
647. Hung, R. J.; and Barnes, A.  
Dissipation of Hydromagnetic Waves with Application to the Outer Solar Corona. III. Transition from Collisional to Collisionless Protons. *Astrophysical Journal*, vol. 181, Apr. 1, 1973, p. 183-208.

648. Inn, E. C. Y.  
CO Quantum Yield in the Photolysis of CO<sub>2</sub> at  $\lambda$ 1470 and  $\lambda$ 1500-1670.  
Journal of Geophysical Research, vol. 77, Apr. 1, 1972, p. 1991-1993.
649. Inn, E. C. Y.; and Heimerl, J. M.  
The Photolysis of CO<sub>2</sub> at Wavelengths Exceeding 1740 Å. Journal of  
the Atmospheric Sciences, vol. 28, Sept. 1971, p. 838-841.
650. Inn, E. C. Y.  
Rate Constant for the Reaction CO(<sup>1</sup>Σ<sup>+</sup>) + O(<sup>3</sup>P) + CO<sub>2</sub> - 2CO<sub>2</sub>.  
Journal of Chemical Physics, vol. 59, Nov. 15, 1973, p. 5431-5433.
651. Intriligator, D. S.; and Wolfe, J. H.  
Evidence of a Diffuse Magnetopause Boundary. Journal of Geophysical  
Research, vol. 77, Oct. 1, 1972, p. 5480-5486.
652. Intriligator, D. S.; Wolfe, J. H.; and McKibbin, D. D.  
Simultaneous Solar-Wind Plasma and Magnetic-Field Measurements in  
the Expected Region of the Extended Geomagnetic Tail. Journal of  
Geophysical Research, vol. 77, Sept. 1, 1972, p. 4645-4649.
653. James, T. C.  
Intensity Measurements of the 0,0 Band of the a<sup>3</sup>Π-X<sup>1</sup>Σ Cameron  
System of CO. Journal of Molecular Spectroscopy, vol. 40, Dec. 1971,  
p. 545-553.
654. James, T. C.  
Transition Moments, Franck-Condon Factors, and Lifetimes of Forbidden  
Transitions. Calculation of the Intensity of the Cameron System of  
CO. Journal of Chemical Physics, vol. 55, Oct. 15, 1971, p. 4118-  
4124.
655. Keil, K.; Fodor, R. V.; and Bunch, T. E.  
Contributions to the Mineral Chemistry of Hawaiian Rocks. 2. Feld-  
spars and Interstitial Material in Rocks from Haleakala and West Maui  
Volcanos, Maui, Hawaii. Contributions to Mineralogy and Petrology,  
vol. 37, 1972, p. 253-257.
656. Keil, K.; Prinz, M.; and Bunch, T. E.  
Mineralogy, Petrology, and Chemistry of Some Apollo 12 Samples. In  
Lunar Science Conference, 2nd, Houston, Tex., Jan. 11-14, 1971.  
Proceedings. Cambridge, Mass., MIT Press, 1971. Vol. 1, p. 319-341.
657. Kellman, S. A.; and Black, D. C.  
A Reexamination of the Mean H<sub>1</sub> Density Along the Hubble Sequence.  
Astrophysical Journal, vol. 184, Sept. 15, 1973, p. 753-756.
658. Kerridge, J. F.; and Vedder, J. F.  
Accretionary Processes in the Early Solar System: An Experimental  
Approach. Science, vol. 177, July 14, 1972, p. 161-163.

659. Kerridge, J. F.  
Iron Transport in Chondrites: Evidence from the Warrenton Meteorite. *Geochimica et Cosmochimica Acta*, vol. 36, Aug. 1972, p. 913-916.
660. Khan, I. H.  
Surface Segregation in Titanium as Monitored by Auger Electron Spectroscopy. *Surface Science*, vol. 40, Dec. 1973, p. 723-727.
661. Kuhn, P. M.; Lojko, M. S.; and Petersen, E. V.  
Water Vapor: Stratospheric Injection by Thunderstorms. *Science*, vol. 174, Dec. 24, 1971, p. 1319-1321.
662. Leovy, C. B.; and Pollack, J. B.  
A First Look at Atmospheric Dynamics and Temperature Variations on Titan. *Icarus*, vol. 19, June 1973, p. 195-201.
663. Leovy, C. B.; Briggs, G. A.; Young, A. T.; Smith, B. A.; Pollack, J. B.; Shipley, E. N.; and Wildey, R. L.  
The Martian Atmosphere: Mariner 9 Television Experiment Progress Report. *Icarus*, vol. 17, Oct. 1972, p. 373-393.
664. Leovy, C. B.; Zurek, R. W.; and Pollack, J. B.  
Mechanisms for Mars Dust Storms. *Journal of the Atmospheric Sciences*, vol. 30, July 1973, p. 749-762.
665. Loewenstein, M.  
Instrumentation for Air Quality Measurements. *IEEE Transactions on Aerospace and Electronic Systems*, vol. AES-9, Jan. 1973, p. 11-17.
666. Lovering, J. F.; Wark, D. A.; Reid, A. F.; Ware, N. G.; Keil, K.; Prinz, M.; Bunch, T. E.; El Goresy, A.; Ramdohr, P.; Brown, G. M.; Peckett, A.; Phillips, R.; Cameron, E. N.; Douglas, J. A. V.; and Plant, A. G.  
Tranquillityite: A New Silicate Mineral from Apollo 11 and Apollo 12 Basaltic Rocks. In *Lunar Science Conference, 2nd, Houston, Tex., Jan. 11-14, 1971. Proceedings. Cambridge, Mass., MIT Press, 1971. Vol. 1, p. 39-45.*  
(Also published as *Geochimica et Cosmochimica Acta. Supplement 2, 1971, p. 701-718*)
667. Maeda, H.; and Maekawa, K.  
A Numerical Study of Polar Ionospheric Currents. *Planetary and Space Science*, vol. 21, Aug. 1973, p. 1287-1300.
668. Mandeville, J.-C.; and Vedder, J. F.  
Microcraters Formed in Glass by Low Density Projectiles. *Earth and Planetary Science Letters*, vol. 11, July 1971, p. 297-306.
669. Mandeville, J.-C.  
Profile and Depth of Microcraters Formed in Glass. *Earth and Planetary Science Letters*, vol. 15, June 1972, p. 110-112.



670. Mandeville, J.-C.; and Lem, H. Y.  
Scanning Electron Microscope and Energy Dispersive X-Ray Analysis of the Surface Features of Surveyor III Television Mirror. In Lunar Science Conference, 3rd, Houston, Tex., Jan. 10-13, 1972. Proceedings. Cambridge, Mass., MIT Press, 1972. Vol. 3, p. 3201-3212.
671. Masursky, H.; Batson, R. M.; McCauley, J. F.; Soderblom, L. A.; Wildey, R. L.; Carr, M. H.; Milton, D. J.; Wilhelms, D. E.; Smith, B. A.; Kirby, T. B.; Robinson, J. C.; Leovy, C. B.; Briggs, G. A.; Duxbury, T. C.; Acton, C. H., Jr.; Murray, B. C.; Cutts, J. A.; Sharp, R. P.; Smith, S.; Leighton, R. B.; Sagan, C.; Veverka, J.; Noland, M.; Lederberg, J.; Levinthal, E.; Pollack, J. B.; Moore, J. T., Jr.; Hartmann, W. K.; Shipley, E. N.; de Vaucouleurs, G.; and Davies, M. E.  
Mariner 9 Television Reconnaissance of Mars and its Satellites: Preliminary Results. *Science*, vol. 175, Jan. 21, 1972, p. 294-305. (Also published as NASA TM-X-67714)
672. McClenahan, J. O.  
Optimal Use of Double Pin Ionization Gauges for Shock Wave Detection. *Review of Scientific Instruments*, vol. 44, Feb. 1973, p. 212-215.
673. McCormick, P. T.; and Whitten, R. C.  
On the Effect of Departures from Spherical Symmetry upon the Bistatic-Radar Occultation Experiment. *Planetary and Space Science*, vol. 20, May 1972, p. 822-824.
674. McCormick, P. T.; and Whitten, R. C.  
On the Effect of Electron-Neutral Particle Collisions upon the Refraction of High-Frequency Radio Waves by the Lower Atmosphere and Ionosphere of Mars. *Planetary and Space Science*, vol. 21, May 1973, p. 881-883.
675. McPherron, R. L.; Parks, G. K.; Colburn, D. S.; and Montgomery, M. D.  
Satellite Studies of Magnetospheric Substorms on August 15, 1968. II. Solar Wind and Outer Magnetosphere. *Journal of Geophysical Research*, vol. 78, June 1, 1973, p. 3054-3061.
676. Meng, C.-I.; and Mihalov, J. D.  
Average Plasma-Sheet Configuration Near 60 Earth Radii. *Journal of Geophysical Research*, vol. 77, Apr. 1, 1972, p. 1739-1755.
677. Meng, C.-I.; and Mihalov, J. D.  
On the Diamagnetic Effect of the Plasma Sheet Near 60 Earth Radii. *Journal of Geophysical Research*, vol. 77, Sept. 1, 1972, p. 4661-4669.
678. Mihalov, J. D.; and Wolfe, J. H.  
Average Solar Wind Proton Properties from Pioneers 6 and 7. *Cosmic Electrodynamics*, vol. 2, Oct. 1971, p. 326-339.

679. Mihalov, J. D.  
Limits to Energetic Proton Fluxes Trapped in Jupiter's Magnetosphere. Planetary and Space Science, vol. 20, Aug. 1972, p. 1345-1347.
680. Mihalov, J. D.  
On Limits to Jupiter's Magnetospheric Diffusion Rates. Astrophysics and Space Science, vol. 20, Feb. 1973, p. 483-490.
681. Millard, J. P.; and Pearson, B. D., Jr.  
Optical Stability of Coatings Exposed to Four Years Space Environment on OSO-III. American Institute of Aeronautics and Astronautics. Thermophysics Conference, 8th, Palm Springs, Calif., July 16-18, 1973. AIAA Paper 73-734.
682. Millard, J. P.; and Arvesen, J. C.  
Polarization: A Key to an Airborne Optical System for the Detection of Oil on Water. Science, vol. 180, June 15, 1973, p. 1170-1171.
683. Millard, J.; and Arvesen, J.  
Results of Airborne Measurements to Detect Oil Spills by Reflected Sunlight. U.S. Coast Guard Report, no. 714104, 1971, p. 38-63.
684. Millard, J. P.; Arvesen, J. C.; Lewis, P. L.; and Woolever, G. F.  
Video Systems for Real-Time Oil-Spill Detection. In Joint Conference on Sensing of Environmental Pollutants, 2d, Washington, D.C., Dec. 10-12, 1973. ISA Reprint, 1973, p. 355-361.
685. Mulholland, D. R.; and Neel, C. B.  
Airborne-Science Techniques Aid Shuttle Planning. Astronautics and Aeronautics, vol. 11, May 1973, p. 24-32.
686. Mulholland, D. R.  
A Cost-Effective Approach for Flight Experiments - Application of Airborne Science Aircraft Experience to the Shuttle Sortie Lab. In International Astronautical Federation. International Astronautical Congress, 24th, Baku, Azerbaidzhan SSR, Oct. 7-13, 1973. Paper.
687. Neel, C. B.; Parker, J. A.; Fish, R. H.; Henshaw, J.; Newland, J. H.; and Tempesta, F. L.  
Heat Shields for Aircraft - A New Concept to Save Lives in Crash Fires. Astronautics and Aeronautics, vol. 9, Nov. 1971, p. 18-26.
688. Noerdlinger, P. D.; and Petrosian, V.  
Effect of Cosmological Expansion on Self-Gravitating Ensembles of Particles. Astrophysical Journal, vol. 168, Aug. 15, 1971, p. 1-9.
689. Noerdlinger, P. D.; and Scargle, J. D.  
Transfer of Resonance-Line Radiation in Differentially Expanding Atmospheres. II. Analytic Solution for the Case of Coherence in the Frame of the Fluid. Astrophysical Journal, vol. 176, Sept. 1, 1972, p. 463-478.

690. Noland, M.; Veverka, J.; and Pollack, J. B.  
Mariner 9 Polarimetry of Phobos and Deimos. *Icarus*, vol. 20, Dec. 1973, p. 490-502.
691. Oberbeck, V. R.; Aoyagi, M.; and Murray, J. B.  
Circularity of Martian Craters. *Modern Geology*, vol. 3, 1972, p. 195-199.
692. Oberbeck, V. R.  
Laboratory Simulation of Impact Cratering with High Explosives. *Journal of Geophysical Research*, vol. 76, Aug. 10, 1971, p. 5732-5749.
693. Oberbeck, V. R.; and Aoyagi, M.  
Martian Doublet Craters. *Journal of Geophysical Research*, vol. 77, May 10, 1972, p. 2419-2432.  
(Also published as NASA TM-X-62027)
694. Oberbeck, V. R.; Quaide, W. L.; Mahan, M.; and Paulson, J.  
Monte Carlo Calculations of Lunar Regolith Thickness Distributions. *Icarus*, vol. 19, May 1973, p. 87-107.
695. Oberbeck, V. R.; and Morrison, R. H.  
On the Formation of the Lunar Herringbone Pattern. *In Lunar Science Conference, 4th, Houston, Tex., Mar. 5-8, 1973. Proceedings.* New York, Pergamon Press, Inc., 1973. Vol. 1, p. 107-123.
696. Oberbeck, V. R.  
Simultaneous Impact and Lunar Craters. *The Moon*, vol. 6, Jan.-Feb. 1973, p. 83-92.  
(Also published as NASA TM-X-62141)
697. O'Leary, B.; and Van Flandern, T. C.  
Io's Triaxial Figure. *Icarus*, vol. 17, Aug. 1972, p. 209-215.
698. Parkin, C. W.; Dyal, P.; and Daily, W. D.  
Iron Abundance in the Moon from Magnetometer Measurements. *In Lunar Science Conference, 4th, Houston, Tex., Mar. 5-8, 1973. Proceedings.* New York, Pergamon Press, Inc., 1973. Vol. 3, p. 2947-2961.
699. Pollack, J. B.; Summers, A.; and Baldwin, B.  
Estimates of the Size of the Particles in the Rings of Saturn and their Cosmogonic Implications. *Icarus*, vol. 20, Nov. 1973, p. 263-278.
700. Pollack, J. B.  
Greenhouse Models of the Atmosphere of Titan. *Icarus*, vol. 19, May 1973, p. 43-58.
701. Pollack, J. B.; Veverka, J.; Noland, M.; Sagan, C.; Hartmann, W. K.; Duxbury, T. C.; Born, G. H.; Milton, D. J.; and Smith, B. A.  
Mariner 9 Television Observations of Phobos and Deimos. *Icarus*, vol. 17, Oct. 1972, p. 394-407.

702. Pollack, J. B.; Veverka, J.; Noland, M.; Sagan, C.; Duxbury, T. C.; Acton, C. H., Jr.; Born, G. H.; Hartmann, W. K.; and Smith, B. A. Mariner 9 Television Observations of Phobos and Deimos, 2. *Journal of Geophysical Research*, vol. 78, July 10, 1973, p. 4313-4326.
703. Pollack, J. B.; and Whitehill, L. A Multiple-Scattering Model of the Diffuse Component of Lunar Radar Echoes. *Journal of Geophysical Research*, vol. 77, Aug. 10, 1972, p. 4289-4303.
704. Pollack, J. B. A Nongrey Calculation of the Runaway Greenhouse: Implications for Venus' Past and Present. *Icarus*, vol. 14, June 1971, p. 295-306.
705. Pollack, J. B.; and Ohring, G. A Numerical Method for Determining the Temperature Structure of Planetary Atmospheres. *Icarus*, vol. 19, May 1973, p. 34-42.
706. Pollack, J. B.; Guthrie, P. D.; and Shen, B. S. P. On the Absorption of Gamma Rays by Photons in Pulsars, Quasi-Stellar Objects, and Other Source Objects. *Astrophysical Journal*, vol. 169, Nov. 1, 1971, p. L113-L116.
707. Pollack, J. B.; Toon, O. B.; and Khare, B. N. Optical Properties of Some Terrestrial Rocks and Glasses. *Icarus*, vol. 19, July 1973, p. 372-389.
708. Pollack, J. B.; and Morrison, D. Venus: Determination of Atmospheric Parameters from the Microwave Spectrum. *In Planetary Atmospheres, Symposium, 40th, Marfa, Tex., Oct. 26-31, 1969. Proceedings.* Sagan, C.; Owen, T. C.; and Smith, H. J., Editors. Dordrecht, D. Reidel Publishing Co. p. 28-31. (International Astronomical Union. Symposium, no. 40)
709. Price, R. E.; Seward, F. D.; and Swift, C. D. Observation of Several X-Ray Sources in 1970 September. *Astrophysical Journal*, vol. 176, Sept. 15, 1972, p. 611-616.
710. Price, R. E.; Groves, D. J.; Rodrigues, R. M.; Seward, F. D.; Swift, C. D.; and Toor, A. X-Rays from the Magellanic Clouds. *Astrophysical Journal*, vol. 168, Aug. 15, 1971, p. L7-L9.
711. Prinz, M.; Bunch, T. E.; and Keil, K. Composition and Origin of Lithic Fragments and Glasses in Apollo 11 Samples. *Contributions to Mineralogy and Petrology*, vol. 32, 1971, p. 211-230.

712. Prinz, M.; Bunch, T. E.; and Keil, K.  
Electron Microprobe Analyses of Lithic Fragments and Glasses from Apollo 11 Lunar Samples. New Mexico University. Institute of Meteoritics. Special Publication, no. 2, 1971.
713. Prinz, M.; Dowty, E.; Keil, K.; and Bunch, T. E.  
Mineralogy, Petrology and Chemistry of Lithic Fragments from Luna 20 Fines: Origin of the Cumulate ANT Suite and its Relationship to High-Alumina and Mare Basalts. *Geochimica et Cosmochimica Acta*, vol. 37, Apr. 1973, p. 979-1006.
714. Prinz, M.; Dowty, E.; Keil, K.; and Bunch, T. E.  
Spinel Troctolite and Anorthosite in Apollo 16 Samples. *Science*, vol. 179, Jan. 5, 1973, p. 74-76.
715. Quaide, W. L.  
Fe and Mg in Bytownite-Anorthite Plagioclase in Lunar Basaltic Rocks. Lunar Science - III; Revised Abstracts of Papers Presented at the 3rd Lunar Science Conference, Houston, Tex., Jan. 10-13, 1972. Watkins, C., Editor. Houston, Lunar Science Institute, 1972. p. 624-629. (Lunar Science Institute. Contribution, no. 88)
716. Quaide, W.; Oberbeck, V.; Bunch, T.; and Polkowski, G.  
Investigations of the Natural History of the Regolith at the Apollo 12 Site. In Lunar Science Conference, 2nd, Houston, Tex., Jan. 11-14, 1971. Proceedings. Cambridge, Mass., MIT Press, 1971. Vol. 1, p. 701-718.
717. Quaide, W.; and Wrigley, R.  
Mineralogy and Origin of Fra Mauro Fines and Breccias. In Lunar Science Conference, 3rd, Houston, Tex., Jan. 10-13, 1972. Proceedings. Cambridge, Mass., MIT Press, 1972. Vol. 1, p. 771-784.
718. Regas, J. L.; Boese, R. W.; and Giver, L. P.  
Does Spectroscopic Evidence Require Two Scattering Layers in the Venus Atmosphere? *Journal of Quantitative Spectroscopy and Radiative Transfer*, vol. 13, May 1973, p. 461-463; Author's Reply, p. 465-466.
719. Regas, J. L.; Giver, L. P.; Boese, R. W.; and Miller, J. H.  
An Expanded Theoretical Interpretation of the Venus 1.05-Micron CO<sub>2</sub> Line and the Venus 0.8226-Micron H<sub>2</sub>O Line. *Astrophysical Journal*, vol. 185, Oct. 1, 1973, p. 383-390.
720. Regas, J. L.; Giver, L. P.; Boese, R. W.; and Miller, J. H.  
Theoretical Interpretation of the Venus 1.05-Micron CO<sub>2</sub> Band and the Venus 0.8189-Micron H<sub>2</sub>O Line. *Astrophysical Journal*, vol. 173, May 1, 1972, p. 711-725.
721. Reynolds, R. T.; Fricker, P. E.; and Summers, A. L.  
Thermal History of the Moon. In *Progress in Astronautics and Aeronautics*. Vol. 28. Thermal Characteristics of the Moon. Cambridge, Mass., MIT Press, 1972. p. 303-337.

722. Rinehart, J. S.; and Greeley, R.  
Seismic-Wave Velocity Patterns in Some Pahoehoe Basalt Flows. *Journal of Geophysical Research*, vol. 76, Aug. 10, 1971, p. 5764-5769.
723. Rosenberg, R. L.; Coleman, P. J.; and Colburn, D. S.  
North-South Component of Interplanetary Magnetic Field: Explorer 33 and 35 Data. *Journal of Geophysical Research*, vol. 76, Oct. 1, 1971, p. 6661-6665.
724. Sagan, C.; Veverka, J.; Fox, P.; Dubisch, R.; Lederberg, J.; Levinthal, E.; Quam, L.; Tucker, R.; Pollack, J. B.; and Smith, B. A.  
Variable Features on Mars: Preliminary Mariner 9 Television Results. *Icarus*, Vol. 17, Oct. 1972, p. 346-371; Discussion, p. 372.
725. Sagan, C.; Veverka, J.; Fox, P.; Dubisch, R.; French, R.; Gierasch, P.; Quam, L.; Lederberg, J.; Levinthal, E.; Tucker, R.; Eross, B.; and Pollack, J. B.  
Variable Features on Mars. 2. Mariner 9 Global Results. *Journal of Geophysical Research*, vol. 78, July 10, 1973, p. 4163-4196.
726. Scarf, F. L.; Greenstadt, E. W.; Wolfe, J. H.; and Colburn, D. S.  
An Analysis of Pioneer 9 Low-Frequency Wave Observations near Interplanetary Discontinuities. *Journal of Geophysical Research*, vol. 77, July 1, 1972, p. 3317-3327.
727. Scargle, J. D.; Caroff, L. J.; and Noerdlinger, P. D.  
The Physical Properties of the Absorption Envelopes of Two QSOs. In External Galaxies and Quasi-Stellar Objects; Proceedings of the Symposium, University of Uppsala, Uppsala, Sweden, Aug. 10-14, 1970. Evans, D. S., Editor. Dordrecht, D. Reidel Publishing Co., 1972. p. 151-154. (International Astronomical Union. Symposium no. 44)
728. Schubert, G.; Smith, B. F.; Sonett, C. P.; Colburn, D. S.; and Schwartz, K.  
Night Side Electromagnetic Response of the Moon. *Journal of Geophysical Research*, vol. 78, July 1, 1973, p. 3688-3696. (Also published as NASA TM-X-62226)
729. Schubert, G.; and Colburn, D. S.  
Thin Highly Conducting Layer in the Moon: Consistent Interpretation of Dayside and Nightside Electromagnetic Responses. *Journal of Geophysical Research*, vol. 76, Dec. 1, 1971, p. 8174-8180.
730. Sims, J. S.; and Hagstrom, S. A.  
One-Center  $r_{1j}$  Integrals over Slater-Type Orbitals. *Journal of Chemical Physics*, vol. 55, Nov. 15, 1971, p. 4699-4710.
731. Sims, J. S.; and Whitten, R. C.  
Upper and Lower Bounds to Atomic and Molecular Properties. I. Be-Sequence Oscillator Strengths (Dipole-Length Formulation) for the  $1s^2 2s^2 1s-1s^2 2s 2p^1 P$  Transition. *Physical Review A. General Physics*, vol. 8, Nov. 1973, p. 2220-2230.

732. Smith, B. F.; Colburn, D. S.; Schubert, G.; Schwartz, K. and Sonett, C. P.  
Induced Magnetosphere of the Moon. II. Experimental Results from Apollo 12 and Explorer 35. *Journal of Geophysical Research*, vol. 78, Sept. 1, 1973, p. 5437-5448.
733. Smith, Z. K.; and Day, J. R.  
A Mathematical Model of the [ARC] Pioneer 6/7 Plasma Probe. *Review of Scientific Instruments*, vol. 42, July 1971, p. 968-976.
734. Snetsinger, K. G.  
Chromian Aluminian Magnetite and Two Rhodium Alloys in a Platinum Nugget from Goodnews Bay, Alaska. *American Mineralogist*, vol. 58, Mar.-Apr. 1973, p. 189-194.
735. Snetsinger, K. G.  
Erichmanite (OsS<sub>2</sub>), A New Mineral. *American Mineralogist*, vol. 56, Sept.-Oct. 1971, p. 1501-1506.
736. Snetsinger, K. G.  
Ferroan Starkeyite from Del Norte County, California. *The Canadian Mineralogist*, vol. 12, 1973, p. 229.
737. Snetsinger, K. G.  
Osarsite, A New Osmium-Ruthenium Sulfarsenide from California. *American Mineralogist*, vol. 57, July-Aug. 1972, p. 1029-1036.
738. Snetsinger, K. G.  
A Platinum-Metal Nugget from Trinity-County, California. *American Mineralogist*, vol. 56, 1971, p. 1101-1105.
739. Starr, W. L.  
Dissociation-Excitation Reactions of Argon Metastables with Carbon Dioxide. *Journal of Chemical Physics*, vol. 55, Dec. 1, 1971, p. 5419-5421.
740. Starr, W. L.; and Loewenstein, M.  
Total Absorption Cross Sections of Several Gases of Aeronomic Interest at 584 Å. *Journal of Geophysical Research*, vol. 77, Sept. 1, 1972, p. 4790-4796.
741. Stöffler, D.  
Deformation and Transformation of Rock-Forming Minerals by Natural and Experimental Shock Processes. I. Behavior of Minerals under Shock Compression. *Fortschritte der Mineralogie*, vol. 49, Nov. 1972, p. 50-113.
742. Stöffler, D.; and Hornemann, U.  
Quartz and Feldspar Glasses Produced by Natural and Experimental Shock. *Meteoritics*, vol. 7, Sept. 30, 1972, p. 371-394.

743. Swift, C. D.; Witteborn, F. C.; Erickson, E. F.; Caroff, L. J.; Augason, G. C.; Mord, A. J.; Kunz, L. W.; and Giver, L. P. Low Resolution Spectrum of the Orion Nebula in the 60-300 Micron Range. In Interstellar Dust and Related Topics; Proceedings of the Symposium, Albany, N.Y., May 29-June 2, 1972. Greenberg, J. M.; and van de Hulst, H. C., Editors. Dordrecht, D. Reidel Publishing Co., 1973. p. 453-457.
744. Toon, O. B.; and Pollack, J. B. Physical Properties of the Stratospheric Aerosols. *Journal of Geophysical Research*, vol. 78, Oct. 20, 1973, p. 7051-7056.
745. Vedder, J. F. Craters Formed in Mineral Dust by Hypervelocity Microparticles. *Journal of Geophysical Research*, vol. 77, Aug. 10, 1972, p. 4304-4309.
746. Vedder, J. F. Microcraters in Glass and Minerals. *Earth and Planetary Science Letters*, vol. 11, July 1971, p. 291-296.
747. Vedder, J. F.; and Lem, H. Y. Profiling with the Electron Microscope. *Photogrammetric Engineering*, vol. 38, Mar. 1972, p. 243-244.
748. Webster, D. L.; Alksne, A. Y.; and Whitten, R. C. Does Io's Ionosphere Influence Jupiter's Radio Bursts? *Astrophysical Journal*, vol. 174, June 15, 1972, p. 685-696.
749. Webster, D. L.; and Whitten, R. C. Which Electromagnetic Equations Apply in Rotating Coordinates? *Astrophysics and Space Science*, vol. 24, Oct. 1973, p. 323-333.
750. Whitcomb, J. H.; Garmany, J. D.; and Anderson, D. L. Earthquake Prediction: Variation of Seismic Velocities Before the San Fernando Earthquake. *Science*, vol. 180, May 11, 1973, p. 632-635.
751. Whitten, R. C.; and Poppoff, I. G. *Fundamentals of Aeronomy.* New York, John Wiley and Sons, Inc., 1971.
752. Whitten, R. C.; and Riegel, C. A. Internal Gravity Waves in an Atmosphere with Wind Shear: Validity of the WKB Approximation at Critical Layers in the Presence of Buoyancy Forces. *Journal of the Atmospheric Sciences*, vol. 30, Mar. 1973, p. 313-316.
753. Whitten, R. C.; Poppoff, I. G.; Sims, J. S.; Barker, W. A.; McCormick, P. T.; and Dubach, J. The Ionosphere of Mars Below 80 km Altitude - II. Solar Cosmic Ray Event. *Planetary and Space Science*, vol. 19, Aug. 1971, p. 971-979.



754. Whitten, R. C.; and Turco, R. P.  
A Model for Studying the Effects of Injecting Contaminants into the Stratosphere and Mesosphere. American Institute of Aeronautics and Astronautics and American Meteorological Society. International Conference on the Environmental Impact of Aerospace Operations in the High Atmosphere, Denver, Colo., June 11-13, 1973. AIAA Paper 73-539.
755. Whitten, R. C.; Sims, J. S.; and Turco, R. P.  
A Model of Carbon Compounds in the Stratosphere and Mesosphere. Journal of Geophysical Research, vol. 78, Aug. 20, 1973, p. 5362-5374.
756. Whitten, R. C.; and Sims, J. S.  
The Photolytic Stability of the Martian Atmosphere. Planetary and Space Science, vol. 21, Aug. 1973, p. 1333-1338.
757. Wilcox, J. M.; and Colburn, D. S.  
Interplanetary Sector Structure at Solar Maximum. Journal of Geophysical Research, vol. 77, Feb. 1, 1972, p. 751-756.
758. Wrigley, R. C.  
Radionuclides at Descartes in the Central Highlands. In Lunar Science Conference, 4th, Houston, Tex., Mar. 5-8, 1973. Proceedings. New York, Pergamon Press, Inc., 1973. Vol. 2, p. 2203-2208.
759. Wrigley, R. C.  
Some Cosmogenic and Primordial Radionuclides in Apollo 12 Lunar Surface Materials. In Lunar Science Conference, 2nd, Houston, Tex., Jan. 11-14, 1971. Proceedings. Cambridge, Mass., MIT Press, 1971. Vol. 2. p. 1791-1796.

#### PATENTS

760. Munoz, R. M.  
Continuous Fourier Transform Method and Apparatus. Apr. 18, 1973.  
US-PATENT-APPL-SN-352382
761. Reinisch, R. F.; Gloria, H. R.; Goldsberry, R. E.; and Adamson, M. J.  
Ultraviolet and Thermally Stable Polymer Compositions. Jan. 5, 1973.  
US-PATENT-APPL-SN-321179
762. Reinisch, R. F.; Gloria, H. R.; Goldsberry, R. E.; and Adamson, M. J.  
Ultraviolet and Thermally Stable Polymer Compositions. Nov. 8, 1973.  
US-PATENT-APPL-SN-414043
763. Zaviantseff, V.  
Apparatus for Ionization Analysis. July 11, 1972.  
US-PATENT-3,676,674

764. Zeiger, R. J.; and Gerdts, J. C.  
Concentric Differential Gearing Arrangement. Nov. 29, 1972.  
US-PATENT-APPL-SN-310615

100  
101  
102  
103  
104  
105  
106  
107  
108  
109  
110  
111  
112  
113  
114  
115  
116  
117  
118  
119  
120  
121  
122  
123  
124  
125  
126  
127  
128  
129  
130  
131  
132  
133  
134  
135  
136  
137  
138  
139  
140  
141  
142  
143  
144  
145  
146  
147  
148  
149  
150  
151  
152  
153  
154  
155  
156  
157  
158  
159  
160  
161  
162  
163  
164  
165  
166  
167  
168  
169  
170  
171  
172  
173  
174  
175  
176  
177  
178  
179  
180  
181  
182  
183  
184  
185  
186  
187  
188  
189  
190  
191  
192  
193  
194  
195  
196  
197  
198  
199  
200  
201  
202  
203  
204  
205  
206  
207  
208  
209  
210  
211  
212  
213  
214  
215  
216  
217  
218  
219  
220  
221  
222  
223  
224  
225  
226  
227  
228  
229  
230  
231  
232  
233  
234  
235  
236  
237  
238  
239  
240  
241  
242  
243  
244  
245  
246  
247  
248  
249  
250  
251  
252  
253  
254  
255  
256  
257  
258  
259  
260  
261  
262  
263  
264  
265  
266  
267  
268  
269  
270  
271  
272  
273  
274  
275  
276  
277  
278  
279  
280  
281  
282  
283  
284  
285  
286  
287  
288  
289  
290  
291  
292  
293  
294  
295  
296  
297  
298  
299  
300  
301  
302  
303  
304  
305  
306  
307  
308  
309  
310  
311  
312  
313  
314  
315  
316  
317  
318  
319  
320  
321  
322  
323  
324  
325  
326  
327  
328  
329  
330  
331  
332  
333  
334  
335  
336  
337  
338  
339  
340  
341  
342  
343  
344  
345  
346  
347  
348  
349  
350  
351  
352  
353  
354  
355  
356  
357  
358  
359  
360  
361  
362  
363  
364  
365  
366  
367  
368  
369  
370  
371  
372  
373  
374  
375  
376  
377  
378  
379  
380  
381  
382  
383  
384  
385  
386  
387  
388  
389  
390  
391  
392  
393  
394  
395  
396  
397  
398  
399  
400  
401  
402  
403  
404  
405  
406  
407  
408  
409  
410  
411  
412  
413  
414  
415  
416  
417  
418  
419  
420  
421  
422  
423  
424  
425  
426  
427  
428  
429  
430  
431  
432  
433  
434  
435  
436  
437  
438  
439  
440  
441  
442  
443  
444  
445  
446  
447  
448  
449  
450  
451  
452  
453  
454  
455  
456  
457  
458  
459  
460  
461  
462  
463  
464  
465  
466  
467  
468  
469  
470  
471  
472  
473  
474  
475  
476  
477  
478  
479  
480  
481  
482  
483  
484  
485  
486  
487  
488  
489  
490  
491  
492  
493  
494  
495  
496  
497  
498  
499  
500  
501  
502  
503  
504  
505  
506  
507  
508  
509  
510  
511  
512  
513  
514  
515  
516  
517  
518  
519  
520  
521  
522  
523  
524  
525  
526  
527  
528  
529  
530  
531  
532  
533  
534  
535  
536  
537  
538  
539  
540  
541  
542  
543  
544  
545  
546  
547  
548  
549  
550  
551  
552  
553  
554  
555  
556  
557  
558  
559  
560  
561  
562  
563  
564  
565  
566  
567  
568  
569  
570  
571  
572  
573  
574  
575  
576  
577  
578  
579  
580  
581  
582  
583  
584  
585  
586  
587  
588  
589  
590  
591  
592  
593  
594  
595  
596  
597  
598  
599  
600  
601  
602  
603  
604  
605  
606  
607  
608  
609  
610  
611  
612  
613  
614  
615  
616  
617  
618  
619  
620  
621  
622  
623  
624  
625  
626  
627  
628  
629  
630  
631  
632  
633  
634  
635  
636  
637  
638  
639  
640  
641  
642  
643  
644  
645  
646  
647  
648  
649  
650  
651  
652  
653  
654  
655  
656  
657  
658  
659  
660  
661  
662  
663  
664  
665  
666  
667  
668  
669  
670  
671  
672  
673  
674  
675  
676  
677  
678  
679  
680  
681  
682  
683  
684  
685  
686  
687  
688  
689  
690  
691  
692  
693  
694  
695  
696  
697  
698  
699  
700  
701  
702  
703  
704  
705  
706  
707  
708  
709  
710  
711  
712  
713  
714  
715  
716  
717  
718  
719  
720  
721  
722  
723  
724  
725  
726  
727  
728  
729  
730  
731  
732  
733  
734  
735  
736  
737  
738  
739  
740  
741  
742  
743  
744  
745  
746  
747  
748  
749  
750  
751  
752  
753  
754  
755  
756  
757  
758  
759  
760  
761  
762  
763  
764  
765  
766  
767  
768  
769  
770  
771  
772  
773  
774  
775  
776  
777  
778  
779  
780  
781  
782  
783  
784  
785  
786  
787  
788  
789  
790  
791  
792  
793  
794  
795  
796  
797  
798  
799  
800  
801  
802  
803  
804  
805  
806  
807  
808  
809  
810  
811  
812  
813  
814  
815  
816  
817  
818  
819  
820  
821  
822  
823  
824  
825  
826  
827  
828  
829  
830  
831  
832  
833  
834  
835  
836  
837  
838  
839  
840  
841  
842  
843  
844  
845  
846  
847  
848  
849  
850  
851  
852  
853  
854  
855  
856  
857  
858  
859  
860  
861  
862  
863  
864  
865  
866  
867  
868  
869  
870  
871  
872  
873  
874  
875  
876  
877  
878  
879  
880  
881  
882  
883  
884  
885  
886  
887  
888  
889  
890  
891  
892  
893  
894  
895  
896  
897  
898  
899  
900  
901  
902  
903  
904  
905  
906  
907  
908  
909  
910  
911  
912  
913  
914  
915  
916  
917  
918  
919  
920  
921  
922  
923  
924  
925  
926  
927  
928  
929  
930  
931  
932  
933  
934  
935  
936  
937  
938  
939  
940  
941  
942  
943  
944  
945  
946  
947  
948  
949  
950  
951  
952  
953  
954  
955  
956  
957  
958  
959  
960  
961  
962  
963  
964  
965  
966  
967  
968  
969  
970  
971  
972  
973  
974  
975  
976  
977  
978  
979  
980  
981  
982  
983  
984  
985  
986  
987  
988  
989  
990  
991  
992  
993  
994  
995  
996  
997  
998  
999  
1000

THERMO- AND GAS-DYNAMICS DIVISION

FORMAL REPORTS

765. Anon.  
Convection in the Tanks of a Rotating Spacecraft. June 1972.  
NASA TR-R-386 N72-27313
766. Bailey, F. R.  
Numerical Calculation of Transonic Flow about Slender Bodies of  
Revolution. Dec. 1971.  
NASA TN-D-6582 N72-11899
767. Baldwin, B.; Martin, E. D.; Reinhardt, W. A.; and Sheaffer, Y.  
Mixing Effectiveness in the Apollo Oxygen Tanks of Spin-Up and  
Rotation-Reversal Maneuvers. In MSC Cryogenics Symposium, Manned  
Spacecraft Center, Houston, Tex., May 1971. Papers, 1971. p. 205-232.  
NASA TM-X-67794 N72-23793
768. Baldwin, B. S.; Reinhardt, W. A.; and Sheaffer, Y. S.  
Analysis of Thermodynamic States Resulting from Small-Density-Variation  
Approximation of Fluid Motion in Cryogenic Oxygen Tanks. In Anon.  
Convection in the Tanks of a Rotating Spacecraft. June 1972. p. 99-121.  
NASA TR-R-386 N72-27313
769. Baldwin, B. S.; Chigier, N. A.; and Sheaffer, Y. S.  
Decay of Far Flow Field in Trailing Vortices. June 28, 1973.  
NASA TM-X-69495 N73-29179
770. Baldwin, B. S.; Reinhardt, W. A.; and Sheaffer, Y. S.  
Results from Numerical Computations Simulating Flows in an Apollo Oxygen  
Tank. In Anon. Convection in the Tanks of a Rotating Spacecraft.  
June 1972. p. 123-137.  
NASA TR-R-386 N72-27313
771. Ballhaus, W. F.; and Caradonna, F. X.  
The Effect of Planform Shape on the Transonic Flow Past Rotor Tips.  
In Advisory Group for Aerospace Research and Development, Paris. Aero-  
dynamics of Rotary Wings, Marseilles, 13-15 Sept. 1972. Feb. 1973.  
AGARD-CP-111 N73-21048
772. Centolanzi, F. J.; Zimmerman, N. B.; Covington, M. A.; and Nichols,  
F. H.  
Aerodynamic Simulation Tests of RSI Panels. In Symposium on Reusable  
Surface Insulation for Space Shuttle, Ames Research Center, Moffett  
Field, Calif., 1-3 Nov., 1972. Vol. 2. Environmental Testing. 1973.  
p. 371-423.  
NASA TM-X-2720 N73-33476

773. Centolanzi, F. J.; Probst, H. B.; Lowell, C. E.; and Zimmerman, N. B.  
ARC Jet Tests of Metallic TPS Materials. Oct. 15, 1971.  
NASA TM-X-62092 N71-38068
774. Christian, J. D.; and Gilbreath, W. P.  
Rates and Mechanisms of the Atomic Oxygen Reaction with Nickel at  
Elevated Temperatures. Aug. 1973.  
NASA TM-X-62295 N73-29524
775. Cleary, J. W.  
Experimental Surface Flow Patterns and Flow-Field Phenomena of a Delta-  
Wing Space-Shuttle Orbiter. Feb. 1972.  
NASA TM-X-62113 N72-24365
776. Cleary, J. W.  
Lee-Side Flow Phenomena on Space Shuttle Configurations at Hypersonic  
Speeds. Part 1 - Flow Separation and Flow Field Viscous Phenomena of  
a Delta-Wing Shuttle Orbiter Configuration. In Space Shuttle Aero-  
thermodynamics Technology Conference, Moffett Field, Calif., Dec. 15-16,  
1971. Vol. 2. Heating. Feb. 1972. p. 413-449.  
NASA TM-X-2507 N72-20862
777. Cleary, J. W.  
Pitot-Pressure Distributions of the Flow Field of a Delta-Wing Orbiter.  
May 1972.  
NASA TM-X-62122 N72-27292
778. Coe, C. F.; and Chyu, W. J.  
Pressure-Fluctuation Inputs and Response of Panels Underlying Attached  
and Separated Supersonic Turbulent Boundary Layers. Sept. 1972.  
NASA TM-X-62189 N72-30275
779. Colin, L., Editor.  
Mathematics of Profile Inversion. Aug. 1972.  
NASA TM-X-62150 N73-11585
780. Coon, G. W.  
A Capacitive Accelerometer Suitable for Telemetry. Sept. 1972.  
NASA TM-X-2644 N72-31460
781. Corliss, L. D.; and Dugan, D. C.  
A VTOL Translational Rate Control System Study on a Six Degrees-of-  
Freedom Motion Simulator. Oct. 1972.  
NASA TM-X-62194 N72-33026
782. Cunningham, G. G.  
Low KeV Electron Probe Analysis of Silicate Minerals for Mg, Al, and Si  
Using Pure-Element Standards. Sept. 1972.  
NASA TM-X-62185 N72-32570

783. Dannenberg, R. E.; and Silva, A. F.  
Arc Driver Operation for Either Efficient Energy Transfer or High-  
Current Generator. May 1972.  
NASA TM-X-62162 N72-23175
784. Deerwester, J. M.; Alexander, D.; Arno, R. D.; Edsinger, L. E.;  
Norman, S. M.; Sinclair, K. F.; Tindle, E. L.; and Wood, R. D.  
Data Acquisition System for Operational Earth Observation Missions.  
Feb. 1972.  
NASA TM-X-62107 N72-18199
785. Goldstein, H. E.; Buckley, J. D.; King, H. M.; Probst, H. B.; and  
Spiker, I. K.  
Reusable Surface Insulation Materials Research and Development. In  
NASA Space Shuttle Technology Conference: Dynamics and Aeroelasticity;  
Structures and Materials, San Antonio, Tex., Apr. 12-14, 1972. Progress  
Report, July 1972, p. 373-433.  
NASA TM-X-2570 N72-30879
786. Goldstein, H. E.; Smith, M.; Leiser, D.; Katvala, V.; and Stewart, D.  
Silica Reusable Surface Insulation Improvement Research. In Symposium  
on Reusable Surface Insulation for Space Shuttle, Ames Research Center,  
Moffett Field, Calif., Nov. 1-3, 1972. Vol. 1. RSI Fabrication,  
Improvement, Morphology and Properties. 1973. p. 155-196.  
NASA TM-X-2719 N73-33467
787. Green, M. J.; and Nachtsheim, P. R.  
Numerical Method for the Solution of Large Systems of Differential  
Equations of the Boundary-Layer Type. Oct. 1972.  
NASA TN-D-7068 N72-33268
788. Jedlicka, J.; and Haacker, J.  
Some Experimental Observations on Circulating Currents in a Crossed  
Field Plasma Accelerator. Dec. 1971.  
NASA TM-X-67450 N72-14744
789. Kaattari, G. E.  
A Method for Predicting Shock Shapes and Pressure Distributions on  
Two-Dimensional Airfoils at Large Angles of Attack. Mar. 1973.  
NASA TN-D-7197 N73-18001
790. Kaattari, G. E.  
Prediction of Centerline Shock-Layer Thickness and Pressure Distribution  
on Delta Wing-Body Configurations. Oct. 1971.  
NASA TN-D-6550 N71-36418
791. Kemp, J. H., Jr.; and Owen, F. K.  
Experimental Study of Nozzle Wall Boundary Layers at Mach Numbers 20 to  
47. Oct. 1972.  
NASA TN-D-6965 N73-11261

792. Kuehn, D. M.  
A High-Pressure Carbon Dioxide Gasdynamic Laser. Nov. 1973.  
NASA TN-D-7471 N74-10506
793. Kussoy, M. I.; Stewart, D. A.; and Horstman, C. C.  
Hypersonic Rarefied Flow Over Sharp Slender Cones. Mar. 1972.  
NASA TN-D-6689 N72-18289
794. Kutler, P.; Rakich, J. V.; and Mateer, G. G.  
Application of Shock Capturing and Characteristics Methods to Shuttle  
Flow Fields. In Space Shuttle Aerothermodynamics Technology Conference,  
Moffett Field, Calif., Dec. 15-16, 1971. Vol. 1. Flow Fields.  
Feb. 1972. p. 65-92.  
NASA TM-X-2507 N72-20850
795. Larson, H. K.; Centolanzi, F. J.; Vojvodich, N. S.; Goldstein, H.;  
Covington, M. A.; and Matting, F. W.  
Environmental Testing for Evaluation of Space Shuttle Thermal  
Protection Materials and Systems. In NASA Space Shuttle Technology  
Conference, Hampton, Va., 2-4 Mar., 1971. Vol. 2. Structures and  
Materials. Apr. 1971. p. 301-333.  
NASA TM-X-2273 N71-29461
796. Leiser, D. B.; Stewart, D. A.; and Goldstein, H. E.  
Chemical and Morphological Changes of Reusable Surface Insulation  
Coatings as a Function of Convectively Heated Cyclic Testing. In  
Symposium of Reusable Surface Insulation for Space Shuttle, Ames  
Research Center, Moffett Field, Calif., Nov. 1-3, 1972. Vol. 2.  
Environmental Testing. Sept. 1973. p. 851-894.  
NASA TM-X-2720 N73-33488
797. Levy, L. L., Jr.; and Burns, R. K.  
Safe Atmosphere Entry of an Isotope Heat Source with a Single Stable  
Trim Attitude at Hypersonic Speeds. June 1972.  
NASA TN-D-6833 N72-24994
798. Lind, R. C.  
Equations for the Kinetic Modeling of Supersonically Flowing Electrically  
Excited Lasers. Jan. 1973.  
NASA TM-X-62196 N73-16538
799. Lockman, W. K.; and DeRose, C. E.  
Aerodynamic Heating of a Space Shuttle Delta-Wing Orbiter. Aug. 1971.  
NASA TM-X-62057 N71-36344
800. Lomax, H.; and Bailey, F. R.  
Computational Method for Calculating Convection in a Rotating Tank.  
In Anon. Convection in the Tanks of a Rotating Spacecraft. June 1972.  
p. 39-59.  
NASA TR-R-386 N72-27313

801. Lomax, H.; and Kutler, P.  
 Numerical Solutions for the Complete Shock Wave Structure Behind  
 Supersonic-Edge Delta Wings. In Conference on Sonic Boom Research,  
 3d, Washington, D. C., Oct. 29-30, 1970. Schwartz, Ira R., Editor.  
 1971. p. 17-25.  
 NASA SP-255 N71-28365
802. Lomax, H.; Bailey, F. R.; and Ballhaus, W. F.  
 On the Numerical Simulation of Three-Dimensional Transonic Flow with  
 Application to the C-141 Wing. Aug. 1973.  
 NASA TN-D-6933 N73-27889
803. MacCormack, R. W.; and Warming, R. F.  
 Survey of Computational Methods for Three-Dimensional Supersonic  
 Inviscid Flows with Shocks. In Advisory Group for Aerospace Research  
 and Development, Paris. Advances in Numerical Fluid Dynamics. Feb.  
 1973.  
 AGARD-LS-64 N74-22919
804. Martin, E. D.; Baldwin, B. S.; and Covert, M.  
 Effects of Circular Geometry in Simulation of Convection in Rotating-  
 Spacecraft Tanks. Oct. 1972.  
 NASA TR-R-392 N73-10312
805. Martin, E. D.; and Baldwin, B. S.  
 Flow Equations Governing Combined Forced and Natural Convection for  
 Application in a Rotating Tank. In Anon. Convection in the Tanks of  
 a Rotating Spacecraft. June 1972. p. 9-37.  
 NASA TR-R-386 N72-27313
806. Martin, E. D.  
 A Method for Calculating Laminar Viscous, Compressible Flows with  
 Small Pressure Gradients. Oct. 1972.  
 NASA TN-D-6998 N73-10313
807. Martin, E. D.  
 An Overview of the Rotating Spacecraft-Tank Convection Problem. In  
 Anon. Convection in the Tanks of a Rotating Spacecraft. June 1972.  
 p. 3-7.  
 NASA TR-R-386 N72-27313
808. Marvin, J. G.; Lockman, W. K.; Mateer, G. G.; Seegmiller, H. L.;  
 Pappas, C. C.; DeRose, C.; and Kaattari, G. E.  
 Flow Fields and Aerodynamic Heating of Space Shuttle Orbiters. In  
 NASA Space Shuttle Technology Conference, Langley Station, Va.,  
 March 2-4, 1971. Vol. 1. Aerothermodynamics Configurations and  
 Flight Mechanics. April 1971. p. 21-73.  
 NASA TM-X-2272 N71-26053

809. Mateer, G. G.  
Effects of Roughness on Heating and Boundary-Layer Transition. Part II  
- Effects of Discrete Roughness on Heating. In Space Shuttle Aero-  
thermodynamics Technology Conference, Moffett Field, Calif., Dec. 15-16,  
1971. Vol. 2. Heating. Feb. 1972. p. 395-411.  
NASA TM-X-2507 N72-20861
810. Mateer, G. G.  
Effects of Wall Cooling and Angle of Attack on Boundary-Layer Transition  
on Sharp Cones at  $M_\infty = 7.4$ . Aug. 1972.  
NASA TN-D-6908 N72-29231
811. Mateer, G. G.  
Windward Surface Heating on the MSC Orbiter Fuselage. Aug. 1971.  
NASA TM-X-62051 N71-36353
812. McDevitt, J. B.  
Comparison of Predicted and Measured Aerodynamics of a Delta Body  
Orbiter. Aug. 1971.  
NASA TM-X-62046 N71-32106
813. McKenzie, R. L.  
Vibrational Relaxation and Radiative Gain in Expanding Flows of  
Anharmonic Oscillators. Mar. 1971.  
NASA TN-D-7050 N71-21308
814. Menees, G. P.  
Experimental Study of Wall Boundary-Layer Growth in the  $10^\circ$  Half-Angle  
Conical Nozzle of a Reflected-Shock Tunnel. Sept. 1972.  
NASA TM-X-2647 N72-32317
815. Millard, J. P.; Green, M. J.; and Sommer, S. C.  
Analytical Design of Sensors for Measuring Atmospheric Temperature  
During Terminal Phase of Planetary Entry. Aug. 1972.  
NASA TN-D-6947 N72-29471
816. Nelson, H. G.  
Aqueous Chloride Stress Corrosion Cracking of Titanium - a Comparison  
with Environmental Hydrogen Embrittlement. Sept. 1973.  
NASA TM-X-62314 N74-11335
817. Nelson, H. G.; and Stein, J. E.  
Gas-Phase Hydrogen Permeation Through Alpha Iron, 4130 Steel, and 304  
Stainless Steel from less than  $100^\circ\text{C}$  to near  $600^\circ\text{C}$ . Apr. 1973.  
NASA TN-D-7265 N73-21442
818. Nelson, H. G.; and Williams D. P.  
Quantitative Observations of Hydrogen-Induced, Slow Crack Growth in a  
Low Alloy Steel. Mar. 1973.  
NASA TM-X-62253 N73-20589



819. Pappas, C. C.  
Calculation of Laminar Heat Transfer to the Windward Surfaces of  
Straight Wing Shuttle Vehicles at High Angle of Attack and with Yaw.  
May 1972.  
NASA TN-D-6614 N72-23995
820. Park, C.  
Estimates of Nitric Oxide Production for Lifting Spacecraft Reentry.  
July 1971.  
NASA TM-X-62052 N72-31862
821. Park, C.; and Love, W. L.  
Gas Core Nuclear Rocket with Fuel Separation by MHD-Driven Rotation.  
In Florida University Research on Uranium Plasmas and Their Techno-  
logical Applications. Thom, K.; and Schneider, R. T., Editors.  
Washington, 1971. p. 139-148.  
NASA SP-236 N71-33641
822. Reinhardt, W. A.  
Calculation of Thermodynamic Properties of Oxygen Near the Critical  
Point. In Anon. Convection in the Tanks of a Rotating Spacecraft.  
June 1972. p. 61-97.  
NASA TR-R-386 N72-27313
823. Reller, J. O., Jr.; and Reddy, N. M.  
Analysis of the Flow in a 1-MJ Electric-Arc Shock Tunnel. June 1972.  
NASA TN-D-6865 N72-25290
824. Rossow, V. J.; Clements, H. G.; and Denardo, B. P.  
A Study of Wire-Deploying Devices Designed to Trigger Lightning.  
Sept. 1971.  
NASA TM-X-62085 N71-36772
825. Rubesin, M. W.; and Rose, W. C.  
The Turbulent Mean-Flow, Reynolds-Stress, and Heat Flux Equations in  
Mass-Averaged Dependent Variables. Mar. 1973.  
NASA TM-X-62248 N73-22235
826. Seegmiller, H. L.  
Effects of Roughness on Heating and Boundary-Layer Transition. Part 1.  
Effects of Simulated Panel Joints on Boundary-Layer Transition. In  
Space Shuttle Aerothermodynamics Technology Conference, Moffett Field,  
Calif., Dec. 15-16, 1971. Vol. 2. Heating. Feb. 1972. p. 375-394.  
NASA TM-X-2507 N72-20860
827. Steger, J. L.; and Baldwin, B. S.  
Shock Waves and Drag in the Numerical Calculation of Isentropic  
Transonic Flow. Oct. 1972.  
NASA TN-D-6997 N73-10314

828. Stewart, D. A.  
Convective Heat-Transfer Rates on a Blunted  $110^\circ$  Cone with Hemispherical Afterbody at Hypersonic Speeds. July 1971.  
NASA TN-D-6433 N71-28862
829. Stewart, D. A.  
Cyclic Arc Plasma Tests of RSI Materials Using a Preheater. In Symposium on Reusable Surface Insulation for Space Shuttle, Ames Research Center, Moffett Field, Calif., Nov. 1-3, 1972. Vol. II. Environmental Testing. 1973. p. 559-589.  
NASA TM-X-2720 N73-33480
830. Stine, H. A.  
Effects of Surface Catalysis on Heat Transfer to Shuttle Orbiters. Mar. 15, 1971.  
NASA TM-X-62016 N71-20523
831. Symposium on Reusable Surface Insulation for Space Shuttle, NASA, Ames Research Center, Moffett Field, Calif., Nov. 1-3, 1972. Vol. I. RSI Fabrication, Improvement, Morphology and Properties. Washington, D. C. Sept. 1973.  
NASA TM-X-2719 N73-33461
832. Symposium on Reusable Surface Insulation for Space Shuttle, NASA, Ames Research Center, Moffett Field, Calif., Nov. 1-3, 1972. Vol. II. Environmental Testing. Washington, D. C. Sept. 1973.  
NASA TM-X-2720 N73-33475
833. Symposium on Reusable Surface Insulation for Space Shuttle, NASA, Ames Research Center, Moffett Field, Calif., Nov. 1-3, 1972. Vol. III. Thermal Protection System Design and Optimization. Washington, D. C. Sept. 1973.  
NASA TM-X-2721 N73-33490
834. Viegas, J. R.  
An Extension of Frost's Mixture Rule to Include the Effects of Multiple Ionization on Electrical Conductivity: Application to Equilibrium Air at  $3000^\circ$  to  $28,000^\circ$  K. Mar. 1971.  
NASA TN-D-5977 N71-18715
835. Vorreiter, J. W.; and Tate, D. L.  
Observations of Disk-Shaped Bodies in Free Flight at Terminal Velocity. Mar. 1973.  
NASA TM-X-62262 N73-22978
836. Vorreiter, J. W.  
Reentry Thermal Protection from Pioneer F RTG Insulation Material. Jan. 1972.  
NASA TM-X-62100 N72-15908

837. Wakefield, R. M.; and Stewart, D. A.  
 Emittance of RSI Coatings Determined from Radiation Measurements  
 in Arc Jet Tests. In Symposium on Reusable Surface Insulation for  
 Space Shuttle, Ames Research Center, Moffett Field, Calif., Nov. 1-3,  
 1972. Vol. II. Thermal Protection System Design. Sept. 1973.  
 p. 1291-1311.  
 NASA TM-X-2721 N73-33501
838. Wakefield, R. M.  
 Surface Emissivity of a Reinforced Carbon Composite Material with an  
 Oxidation-Inhibiting Coating. Oct. 1973.  
 NASA TM-X-62315 N74-12284
839. Whiting, E. E.  
 Computer Program for Determining Rotational Line Intensity Factors for  
 Diatomic Molecules. Sept. 1973.  
 NASA TN-D-7268 N73-30689
840. Yoshikawa, K. K.  
 An Iterative Solution of an Integral Equation for Radiative Transfer  
 by Using Variational Technique. Aug. 1973.  
 NASA TN-D-7292 N73-28916

#### NASA CONTRACTOR REPORTS

841. Abbett, M. J.  
 Boundary Condition Computational Procedures for Inviscid, Supersonic  
 Steady Flow Field Calculations. (REPT-71-41, Aerotherm Corp.,  
 Mountain View, Calif.; NAS2-6341.) Nov. 30, 1971.  
 NASA CR-114446 N72-22336
842. Chou, Y. S.  
 Locally Nonsimilar Solutions for Radiating Shock Layer About Smooth  
 Axisymmetric Bodies. Mar. 1972.  
 NASA CR-1989 N72-18290
843. Chou, Y. S.  
 Radiative Coupled Viscous Flow with Massive Blowing. Mar. 1973.  
 NASA CR-2236 N73-20934
844. Chou, Y. S.  
 SL4 Code - A User's Manual. Mar. 1973.  
 NASA CR-2235 N73-20936
845. Dewitt, D. P.  
 Handbook of the Optical, Thermal and Mechanical Properties of Six  
 Polycrystalline Dielectric Materials. (TPRC-19, Purdue Univ.,  
 Lafayette, Ind.; NAS2-6802.) Sept. 1972.  
 NASA CR-114500 N72-33713

846. Green, A. K.  
The Influence of Defects and Impurities on the Nucleation and Growth of Oriented Films by Evaporation. Apr. 1973.  
NASA CR-2234 N73-22636
847. Nordmark, G. E.; and Kelsey, R. A.  
Effect of Polymer Coatings on Fatigue Strength of Aluminum Alloy 2024 Box Beams. Final Report, Apr. 1971 - May 1972. (Aluminum Co. of America, New Kensington, Pa.; NAS2-6415.) May 1972.  
NASA CR-114699 N74-16250
848. Smith, P. L.; and Russ, R. F.  
Advanced Solid Propellant Motor Insulation. Final Report. (Aerojet Solid Propulsion Co., Sacramento, Calif.; NAS2-6557.) July 1972.  
NASA CR-114513 N73-13959
849. Tannehill, J. C.; and Mohling, R. A.  
Development of Equilibrium Air Computer Programs Suitable for Numerical Computation Using Time-Dependent or Shock-Capturing Methods. Sept. 1972.  
NASA CR-2134 N72-32296
850. Wilson, K. H.  
Evaluation of One-Dimensional Approximations for Radiative Transport in Blunt Body Shock Layers. Mar. 1972.  
NASA CR-1990 N72-19315
851. Wilson, K.  
The VISC Code: A User's Manual. Mar. 1973.  
NASA CR-2237 N73-20933

JOURNAL ARTICLES, MEETING PAPERS, BOOKS AND CHAPTERS OF BOOKS

852. Anderson, L. A.; and Sheldahl, R. E.  
Experiments with Two Flow-Swallowing Enthalpy Probes in High-Energy Supersonic Streams. AIAA Journal, vol. 9, Sept. 1971, p. 1804-1810.
853. Arnold, J. O.; and Whiting, E. E.  
Nonequilibrium Effects on Shock-Layer Radiometry During Earth Entry. Journal of Quantitative Spectroscopy and Radiative Transfer, vol. 13, Sept. 1973, p. 861-870.
854. Arnold, J. O.; and Nicholls, R. W.  
A Shock-Tube Determination of the CN Ground State Dissociation Energy and Electronic Transition Moments for the CN Violet and Red Band Systems. In Recent Developments in Shock Tube Research; Proceedings of the 9th International Symposium, Stanford, Calif., July 16-19, 1973. Stanford, Calif., Stanford University Press, 1973. p. 340-351.

855. Arnold, J. O.; and Nicholls, R. W.  
A Shock Tube Determination of the CN Ground State Dissociation Energy and the CN Violet Electronic Transition Moment. *Journal of Quantitative Spectroscopy and Radiative Transfer*, vol. 13, Feb. 1973, p. 115-133.
856. Arnold, J. O.; and Nicholls, R. W.  
A Shock Tube Determination of the Electronic Transition Moment of the CN Red Band System. *Journal of Quantitative Spectroscopy and Radiative Transfer*, vol. 12, Oct. 1972, p. 1435-1452.
857. Arvesen, J. C.; Weaver, E. C.; and Millard, J. P.  
Rapid Assessment of Water Pollution by Airborne Measurement of Chlorophyll Content. *In Joint Conference on Sensing of Environmental Pollutants*, Palo Alto, Calif., Nov. 8-10, 1971. AIAA Paper 71-1097, Nov. 1971.
858. Arvesen, J. C.; Millard, J. P.; and Weaver, E. C.  
Remote Sensing of Chlorophyll and Temperature in Marine and Fresh Waters. *In International Astronautical Federation. International Astronautical Congress, 22nd, Brussels, Belgium, Sept. 20-25, 1971. Paper.*
859. Bailey, F. R.; and Ballhaus, W. F.  
Relaxation Methods for Transonic Flow about Wing-Cylinder Combinations and Lifting Swept Wings. *In International Conference on Numerical Methods in Fluid Mechanics, 3rd, Paris, France, July 3-7, 1972. Proceedings. Vol. 2. Problems in Fluid Dynamics. Berlin and New York, Springer-Verlag, 1973. p. 2-9. (Lecture Notes in Physics, 19)*
860. Bailey, F. R.; and Steger, J. L.  
Relaxation Techniques for Three-Dimensional Transonic Flow About Wings. *AIAA Journal*, vol. 11, Mar. 1973, p. 318-325.  
(Also published as AIAA Paper 72-189)
861. Baldwin, B.; and Sheaffer, Y.  
Ablation and Breakup of Large Meteoroids During Atmospheric Entry. *Journal of Geophysical Research*, vol. 76, July 1, 1971, p. 4653-4668.
862. Baldwin, B. S.; Chigier, N. A.; and Sheaffer, Y. S.  
Decay of Far-Flowfield in Trailing Vortices. *AIAA Journal*, vol. 11, Dec. 1973, p. 1601-1602.
863. Baldwin, B. S.; Chigier, N. A.; and Sheaffer, Y. S.  
Prediction of Far Flow Field in Trailing Vortices. *American Institute of Aeronautics and Astronautics. Atmospheric Flight Mechanics Conference, 2nd, Palo Alto, Calif., Sept. 11-13, 1972. AIAA Paper 72-989.*

864. Ballhaus, W. F.; and Bailey, F. R.  
Numerical Calculation of Transonic Flow About Swept Wings. American Institute of Aeronautics and Astronautics. Fluid and Plasma Dynamics Conference, 5th, Boston, Mass., June 26-28, 1972. AIAA Paper 72-677.
865. Bauer, E.; and Poppa, H.  
Combined Leed, Auger Electron and Flash Desorption Spectroscopy of Metals on Single Crystal Surfaces. *Le Vide*, vol. 28, Mar.-Apr. 1973, p. 73-74.
866. Bauer, E.; and Poppa, H.  
Recent Advances in Epitaxy. *Thin Solid Films*, vol. 12, 1972, p. 167-185.
867. Beam, R.; and Jedlicka, J.  
A Solar Engine Using the Thermal Expansion of Metals. *Solar Energy*, vol. 15, July 1973, p. 133-142.
868. Beam, R. M.; and Yagoda, H. P.  
On the Torsional Static Stability and Response of Open Section Tubes Subjected to Thermal Radiation Loading. *International Journal of Solids and Structures*, vol. 9, Jan. 1973, p. 151-175.
869. Billman, K. W.; and Mark, H.  
Cautionary Note Concerning the  $\text{CuSO}_4$  X-Ray Laser. *Applied Optics*, vol. 12, Nov. 1973, p. 2529-2531.
870. Billman, K. W.; Stallcop, J. R.; Rowley, P. D.; and Presley, L. L.  
Comparison of Measured and Theoretical Inverse Bremsstrahlung and Photoionization Absorption of Infrared Radiation in a H-He Plasma. *Physical Review Letters*, vol. 28, May 29, 1972, p. 1435-1438.
871. Billman, K. W.; and Stallcop, J. R.  
Measurement of Density and Temperature of a Hydrogen Plasma Using an Argon Laser. *Applied Physics Letters*, vol. 22, June 1, 1973, p. 565-567.
872. Billman, K. W.; and Stallcop, J. R.  
Measurement of Plasma Temperature and Density Using Laser Absorption. In *Recent Developments in Shock Tube Research; Proceedings of the 9th International Symposium, Stanford, Calif., July 16-19, 1973.* Stanford, Calif., Stanford University Press, 1973. p. 218-226.
873. Boitnott, C. A.; and Savage, H. F.  
Light Emission Measurements of Calcium and Magnesium at Simulated Meteor Conditions. II. Spectral Luminous Efficiencies. *Astrophysical Journal*, vol. 167, July 15, 1971, p. 349-355.
874. Boitnott, C. A.; and Warder, R. C., Jr.  
Shock-Tube Measurements of Rotational Relaxation in Hydrogen. *Physics of Fluids*, vol. 14, Nov. 1971, p. 2312-2316.

875. Bowen, S. W.  
High Pressure Nonequilibrium Plasma Nozzle Flows with Axial Current. Gaseous Electronics Conference, 25th, London, Ontario, Oct. 1972. Paper BA4.
876. Bowen, S. W.; and Park, C.  
Population Inversion of A. U. V. Atomic Line in Recombining Plasma Nozzle Flow. American Inst. of Aeronautics and Astronautics. Fluid and Plasma Dynamics Conference, 4th, Palo Alto, Calif., Jun. 21-23, 1971. AIAA Paper 71-592.
877. Bowen, S. W.; and Park, C.  
Population Inversion of Atomic Carbon in Recombining Plasma Flow. AIAA Journal, vol. 10, April 1972, p. 522-524.
878. Centolanzi, F. J.; Probst, H. B.; Lowell, C. E.; and Zimmerman, N. B.  
Arc-Jet Tests of Metallic TPS Materials. In Society of Aerospace Material and Process Engineers. National Technical Conference on Space Shuttle Materials, Huntsville, Ala., Oct. 5-7, 1971. Paper. Azusa, Ca., SAMPE, 1971. p. 689-699.
879. Chapman, D. R.  
Australasian Tektite Geographic Pattern, Crater and Ray of Origin, and Theory of Tektite Events. Journal of Geophysical Research, vol. 76, Sept. 10, 1971, p. 6309-6338.
880. Christian, J. D.  
Measurement of Gas Quantities by Liquid Displacement. Analytical Chemistry, vol. 45, Apr. 1973, p. 698-702.
881. Christian, J. D.  
Strength of Chemical Bonds. Journal of Chemical Education, vol. 50, March 1973, p. 176-177.
882. Cooper, D. M.; and Borucki, W. J.  
Measurements of Hydrogen-Helium Radiation at Shock-Layer Temperatures Appropriate for Jupiter Entry. Journal of Quantitative Spectroscopy and Radiative Transfer, vol. 13, Oct. 1973, p. 1047-1051.
883. Cooper, D. M.; Borucki, W. J.; and Chien, K.-Y.  
Radiative Cooling of Shock-Heated Air in an Explosively Driven Shock Tube. Physics of Fluids, vol. 15, Jan. 1972, p. 39-43.
884. Cooper, D. M.  
Spectral Intensity Measurements from High-Pressure Nitrogen Plasmas. Journal of Quantitative Spectroscopy and Radiative Transfer, vol. 12, Aug. 1972, p. 1175-1189.
885. Covington, M. A.; and Vojvodich, N. S.  
Turbulent Flow Studies in Two Arc-Heated Duct Facilities. Journal of Spacecraft and Rockets, vol. 9, June 1972, p. 441-447.

886. Cramer, R. L.  
Chernoff's Bound in the Study of Traffic Jams. Asilomar Conference on Circuits and Systems, 5th, Nov. 8-10, 1971. Conference Record. p. 606-613.
887. Cramer, R. L.  
Traffic Study of a Computer System. Asilomar Conference on Circuits and Systems, 6th, Nov. 15-17, 1972. Conference Record. p. 179-188.
888. Dahms, R. G.; and Anderson, D. L.  
Emittance Measurement of Surveyor 3 Material. Journal of Geophysical Research, vol. 78, Oct. 1, 1973, p. 6507-6510.
889. Dannenberg, R. E.; and Silva, A. F.  
Arc Driver Operation for Either Efficient Energy Transfer or High-Current Generation. AIAA Journal, vol. 10, Dec. 1972. p. 1563-1564.
890. Dannenberg, R. E.  
A Conical Arc Driver for High-Energy Test Facilities. AIAA Journal, vol. 10, Dec. 1972, p. 1692-1694.
891. Davy, W. C.; and Bar-Nun, A.  
Vaporization Characteristics of Carbon Heat Shields Under Radiative Heating. American Institute of Aeronautics and Astronautics, Thermophysics Conference, 7th, San Antonio, Tex., Apr. 10-12, 1972. AIAA Paper 72-296.
892. Deiwert, G. S.  
Reflection of a Shock Wave from a Thermally Accommodating Wall: Molecular Simulation. Physics of Fluids, vol. 16, Aug. 1973, p. 1215-1219.
893. Deiwert, G. S.; and Hanson, R. K.  
Reflection of a Thick Planar Shock Wave from a Coplanar Surface. In Rarefied Gas Dynamics; Proceedings of the 8th International Symposium, Stanford, Calif., July 10-14, 1972. New York, Academic Press, 1973. p. 145-155.
894. Dryer, M.; Rizzi, A. W.; and Shen, W.-W.  
Interaction of the Solar Wind with the Outer Planets. Astrophysics and Space Science, vol. 22, June 1973, p. 329-351.
895. Gilbreath, W. P.  
Degradation of Space Shuttle TPS Metals in Dissociated Oxygen. Progress in Astronautics and Aeronautics. Vol. 31, Thermal Control and Radiation. N. Y.; Academic Press, 1973. p. 127-143.  
(Also published as AIAA Paper 72-262)



896. Goldsberry, R. E.; Adamson, M. J.; and Reinisch, R. F.  
Poly(diphenylsiloxy)arylazines. I. Synthesis and Characterization.  
Journal of Polymer Science, Part A. Polymer Chemistry, vol. 11,  
Oct. 1973, p. 2401-2421.
897. Hansen, C. F.  
Gas Lasers and Applications. In Recent Developments in Shock Tube  
Research; Proceedings of the 9th International Symposium, Stanford,  
Calif., July 16-19, 1973. Stanford, Calif., Stanford University Press,  
1973. p. 47-58.
898. Hansen, C. F.; and Lee, G.  
Laser Power Stations in Orbit. Astronautics and Aeronautics, vol. 10,  
July 1972, p. 42-55.
899. Hansen, C. F.; and Pearson, W. E.  
A Quantum Model for Bending Vibrations and Thermodynamic Properties  
of C<sub>3</sub>. Canadian Journal of Physics, vol. 51, Apr. 1, 1973, p. 751-760.
900. Heinemann, K.; and Poppa, H.  
Electron Microscope Image Intensification and Specimen Exposure. In  
Electron Microscopy Society of America. 30th Annual Conference,  
Los Angeles, Calif., Aug. 14-17, 1972. Proceedings. p. 610-611.
901. Heinemann, K.; and Poppa, H.  
In-Situ Metal-Gas Reaction Studies. In Electron Microscopy Society of  
America. 31st Annual Conference, New Orleans, La., 1973. Proceedings.  
p. 30-31.
902. Heinemann, K.; and Poppa, H.  
In Situ Sputter Cleaning of Thin Film Metal Substrates for UHV-TEM  
Corrosion Studies. Journal of Vacuum Science and Technology, vol. 10,  
Jan.-Feb. 1973, p. 22-25.
903. Heinemann, K.; and Poppa, H.  
A New Low Cost-Image Intensifier for Transmission Electron Microscopy.  
In Electron Microscopy Society of America. 30th Annual Conference,  
Los Angeles, Calif., Aug. 14-17, 1972. Proceedings. p. 612-613.
904. Heinemann, K.; and Poppa, H.  
Selected-Zone Dark-Field Electron Microscopy. Applied Physics Letters,  
vol. 20, Feb. 1, 1972, p. 122-125.
905. Hiester, N. K.; Clark, C. F.; and Vojvodich, N. S.  
Summary of the NASA-SRI Round Robin Ablation Program. Journal of  
Spacecraft and Rockets, vol. 8, Aug. 1971, p. 886-889.
906. Horstman, C. C.; and Owen, F. K.  
Turbulent Properties of a Compressible Boundary Layer. AIAA Journal,  
vol. 10, Nov. 1972, p. 1418-1424.

907. Howe, J. T.; and Green, M. J.  
Analysis of Sublimation-Cooled Coated Mirrors in Convective and Radiative Environments. AIAA Journal, vol. 11, Jan. 1973, p. 80-87.
908. Howe, J. T.  
Lateral Expansion of a Laser-Supported Detonation Wave in a Gas. AIAA Journal, vol. 10, Dec. 1972, p. 1710-1711.
909. Howe, J. T.  
Thermal-Mechanical Response of Nearly Opaque Materials Exposed to Continuous Radiation. AIAA Journal, vol. 9, Oct. 1971, p. 1911-1920.
910. Howe, J. T.; Green, M. J.; and Weston, K. C.  
Thermal Shielding by Subliming Volume Reflectors in Convective and Intense Radiative Environments. AIAA Journal, vol. 11, July 1973, p. 989-994.
911. Inouye, M.; Marvin, J. G.; and Sheaffer, Y. S.  
Turbulent-Wake Calculations with an Eddy-Viscosity Model. AIAA Journal, vol. 10, Feb. 1972, p. 216-217.
912. Jedlicka, J.  
Solid State Solar Engine. Physics Teacher, vol. 10, Nov. 1972, p. 475-476.
913. Jedlicka, J.; and Haacker, J.  
Some Experimental Observations on Circulating Currents in a Crossed Field Plasma Accelerator. AIAA Journal, vol. 10, May 1972, p. 563-564.
914. Johnson, D. L.; and Nelson, H. G.  
Determination of Hydrogen Permeation Parameters in Alpha Titanium Using the Mass Spectrometer. Metallurgical Transactions, vol. 4, Feb. 1973, p. 569-573.
915. Kemp, J. H., Jr.; and Owen, F. K.  
Nozzle Wall Boundary Layers at Mach Numbers 20 to 47. AIAA Journal, vol. 10, July 1972, p. 872-879.
916. Khan, I. H.  
Low-Temperature Epitaxy of Ge Films by Sputter Deposition. Journal of Applied Physics, vol. 44, Jan. 1973, p. 14-19.
917. Khan, I. H.  
Surface Segregation in Titanium as Monitored by Auger Electron Spectroscopy. Surface Science, vol. 40, Dec. 1973, p. 723-727.
918. Knechtel, E. D.  
Gas-Surface Momentum Accommodation for Conditions Simulating Near-Earth Satellites. Engineer Thesis, Stanford University, Jan. 1972.

919. Knechtel, E. D.; and Pitts, W. C.  
Measured Normal and Tangential Momentum Accommodation on Aluminum of  $N_2^+$  at and Above Earth Satellite Speed. International Astronautical Congress, 22nd, Brussels, Belgium, Sept. 20-25, 1971. Papers.
920. Knechtel, E. D.; and Pitts, W. C.  
Normal and Tangential Momentum Accommodation for Earth Satellite Conditions. *Astronautica Acta*, vol. 18, June 1973, p. 171-184.
921. Knight, D. D.; and Knechtel, E. D.  
Graphite Oxidation at Low Temperature in Subsonic Air. American Institute of Aeronautics and Astronautics. Thermophysics Conference, 8th, Palm Springs, Calif., July 16-18, 1973. AIAA Paper 73-735.
922. Kuehn, D. M.  
Artificial Laser Intensity Oscillations Associated with Beam Splitters. *Applied Optics*, vol. 11, June 1972, p. 1431-1433.
923. Kuehn, D. M.  
Importance of Nozzle Geometry to High-Pressure Gas-Dynamic Lasers. *Applied Physics Letters*, vol. 21, Aug. 1, 1972, p. 112-114.
924. Kussoy, M. I.; Stewart, D. A.; and Horstman, C. C.  
Sharp Slender Cones in Near-Free-Molecule Hypersonic Flow. *AIAA Journal*, vol. 9, Sept. 1971, p. 1879-1881.
925. Kutler, P.; Warming, R. F.; and Lomax, H.  
Computation of Space Shuttle Flowfields Using Noncentered Finite-Difference Schemes. *AIAA Journal*, vol. 11, Feb. 1973, p. 196-204. (Also published as AIAA Paper 72-193)
926. Kutler, P.; Reinhardt, W. A.; and Warming, R. F.  
Multishocked, Three-Dimensional Supersonic Flowfields with Real Gas Effects. *AIAA Journal*, vol. 11, May 1973, p. 657-664. (Also published as AIAA Paper 72-702)
927. Kutler, P.  
Numerical Solution for the Inviscid Supersonic Flow in the Corner Formed by Two Intersecting Wedges. American Institute of Aeronautics and Astronautics. Fluid and Plasma Dynamics Conference, 6th, Palm Springs, Calif., July 16-18, 1973. AIAA Paper 73-675.
928. Kutler, P.; and Lomax, H.  
Shock-Capturing Finite-Difference Approach to Supersonic Flows. *Journal of Spacecraft and Rockets*, vol. 8, Dec. 1971, p. 1175-1182.
929. Lee, G.; Gowen, F. E.; and Hagen, J. R.  
Gain and Power of  $CO_2$  Gasdynamic Lasers. *AIAA Journal*, vol. 10, Jan. 1972, p. 65-71.

930. Lincoln, K. A.; Howe, J. T.; and Liu, T.-M.  
Assessment of Chemical Nonequilibrium for Massively Ablating Graphite.  
AIAA Journal, vol. 11, Aug. 1973, p. 1198-1200.
931. Liu, T.-M.; and Nachtsheim, P. R.  
Numerical Stability of Boundary Layers with Massive Blowing. AIAA  
Journal, vol. 11, Aug. 1973, p. 1197-1198.
932. Liu, T.-M.; and Nachtsheim, P. R.  
Shooting Method for Solution of Boundary-Layer Flows with Massive  
Blowing. AIAA Journal, vol. 11, Nov. 1973, p. 1584-1586.
933. Lundell, J. H.; and Dickey, R. R.  
Ablation of ATJ Graphite at High Temperatures. AIAA Journal, vol. 11,  
Feb. 1973, p. 216-222.
934. Lundell, J. H.; and Dickey, R. R.  
The Ablation of Graphitic Materials in the Sublimation Regime. American  
Institute of Aeronautics and Astronautics. Thermophysics Conference,  
7th, San Antonio, Tex., Apr. 10-12, 1972. AIAA Paper 72-298.
935. MacCormack, R. W.; and Paullay, A. J.  
Computational Efficiency Achieved by Time Splitting of Finite Differ-  
ence Operators. American Institute of Aeronautics and Astronautics.  
Aerospace Sciences Meeting, 10th, San Diego, Calif., Jan 17-19, 1972.  
AIAA Paper 72-154.
936. Martin, E. D.  
Direct Numerical Solution of Three-Dimensional Equations Containing  
Elliptic Operators. International Journal for Numerical Methods in  
Engineering, vol. 6, 1973, p. 201-212.
937. Martin, E. D.  
Extension of a Perturbation-Expansion Method to Strong-Interaction  
Boundary-Layer Problems, with Application to Vorticity Interaction.  
Zeitschrift Für Angewandte Mathematik und Physik, vol. 22, July 25,  
1971, p. 664-680.
938. Marvin, J. C.; Seegmiller, H. L.; Lockman, W. K.; Mateer, G. G.;  
Pappas, C. C.; and DeRose, C. E.  
Surface Flow Patterns and Aerodynamic Heating on Space Shuttle Vehicles.  
Journal of Spacecraft and Rockets, vol. 9, Aug. 1972, p. 573-579.  
(Also published as AIAA Paper no. 71-594)
939. Mateer, G. G.  
The Effect of Angle of Attack on Boundary-Layer Transition on Cones.  
AIAA Journal, vol. 10, Aug. 1972, p. 1127-1128.

940. McDevitt, J. B.  
Effect of Thermally Expanding Surfaces on Aerodynamic Roll Torques for Cones. AIAA Journal, vol. 11, Apr. 1973, p. 505-510.  
(Also published as AIAA Paper 72-30)
941. McGuirk, J. P.; and Park, C.  
Propellant Flow Rate Through Simulated Liquid-Core Nuclear Rocket Fuel Bed. Journal of Spacecraft and Rockets, vol. 9, May 1972, p. 375-376.
942. McKenzie, R. L.  
Diatomic Gasdynamic Lasers. Physics of Fluids, vol. 15, Dec. 1972, p. 2163-2173.  
(Also published as NASA TM-X-62099)
943. Millard, J. P.; and Arvesen, J. C.  
Airborne Optical Detection of Oil on Water. Applied Optics, vol. 11, Jan. 1972, p. 102-107.
944. Millard, J. P.; and Arvesen, J. C.  
Effects of Skylight Polarization, Cloudiness, and View Angle on the Detection of Oil on Water. Joint Conference on Sensing of Environmental Pollutants, Palo Alto, Calif., Nov. 8-10, 1971. AIAA Paper 71-1075.
945. Monson, D. J.  
Measurements of the Duration of Constant Reflected-Shock Temperature in a Reflected-Shock Tunnel. AIAA Journal, vol. 9, Sept. 1971, p. 1872-1874.
946. Moorhead, R. D.; and Poppa, H.  
In-Situ Deposition of Gold on MgO. In Electron Microscopy Society of America. 30th Annual Conference, Los Angeles, Calif., Aug. 14-17, 1972. Proceedings. p. 516-517.
947. Nachtsheim, P. R.; and Larson, H. K.  
Crosshatched Ablation Patterns in Teflon. AIAA Journal, vol. 9, Aug. 1971, p. 1608-1614.
948. Nachtsheim, P. R.; and Hagen, J. R.  
Observations of Crosshatched Wave Patterns in Liquid Films. AIAA Journal, vol. 10, Dec. 1972, p. 1637-1640.
949. Nelson, H. G.  
Environmental Hydrogen Embrittlement of an  $\alpha$ - $\beta$  Titanium Alloy; Effect of Hydrogen Pressure. Metallurgical Transactions, vol. 4, Jan. 1973, p. 364-367.

950. Owen, F. K.; and Horstman, C. C.  
Hypersonic Transitional Boundary Layers. *AIAA Journal*, vol. 10, June 1972, p. 769-775.
951. Owen, F. K.; and Horstman, C. C.  
On the Structure of Hypersonic Turbulent Boundary Layers. *Journal of Fluid Mechanics*, vol. 53, June 27, 1972, p. 611-636.
952. Owen, F. K.; and Horstman, C. C.  
A Study of Turbulence Generation in a Hypersonic Boundary Layer. American Institute of Aeronautics and Astronautics. Aerospace Sciences Meeting, 10th, San Diego, Calif., Jan 17-19, 1972. *AIAA Paper 72-182*.
953. Page, W. A.; Sutton, R. E.; and Miller, R. J.  
Band Absorption in Nonhomogeneous, Isotropically-Scattering Planetary Atmospheres: Theory and Experiment. *Journal of Quantitative Spectroscopy and Radiative Transfer*, vol. 13, Dec. 1973, p. 1343-1364.
954. Park, C.; Anderson, L. A.; and Sheldahl, R. E.  
Atomic Recombination Rate Determination Through Heat-Transfer Measurement. *AIAA Journal*, vol. 11, Mar. 1973, p. 372-374.
955. Park, C.  
Comparison of Electron and Electronic Temperatures in Recombining Nozzle Flow of Ionized Nitrogen-Hydrogen Mixture. Part 1. Theory. *Journal of Plasma Physics*, vol. 9, Apr. 1973, p. 187-215.
956. Park, C.  
Comparison of Electron and Electronic Temperatures in Recombining Nozzle Flow of Ionized Nitrogen-Hydrogen Mixture. Part 2. Experiment. *Journal of Plasma Physics*, vol. 9, Apr. 1973, p. 217-234.
957. Park, C.  
Hydrogen Line Ratios as Electron Temperature Indicators in Nonequilibrium Plasmas. *Journal of Quantitative Spectroscopy and Radiative Transfer*, vol. 12, Mar. 1972, p. 323-370.
958. Park, C.  
Ledge Spacings in Evaporation of Molecular Solids. *Journal of Chemical Physics*, vol. 59, 15 Sept., 1973, p. 3427-3428.
959. Park, C.; and Appleton, J. P.  
Shock Tube Measurement of Soot Oxidation Rates. *Combustion and Flame*, vol. 20, June 1973, p. 369-379.
960. Park, C.; and Appleton, J. P.  
Shock Tube Measurement of Soot Oxidation Rates at Combustion Temperatures and Pressures. In *Recent Developments in Shock Tube Research; Proceedings of the 9th International Shock Tube Symposium, Stanford, Calif., July 16-19, 1973.* Stanford, Stanford University Press, 1973. p. 793-803.

961. Pearson, W. E.; and Hansen, C. F.  
Collision Induced Rotational Transition Probabilities in Diatomic Molecules. International Symposium for Rarefied Gasdynamics, 8th, Stanford University, July 1972. p. 167-175.
962. Pearson, W. E.; and Davy, W. C.  
New Thermodynamic Functions for the  $C_3$  Molecule. AIAA Journal, vol. 11, Aug. 1973, p. 1207-1208.
963. Peterson, D. L.; and Nicolet, W. E.  
Heat Shielding for Venus Entry Probes. American Institute of Aeronautics and Astronautics. Thermophysics Conference, 8th, Palm Springs, Calif., July 16-18, 1973. AIAA Paper 73-712.
964. Peterson, D. L.; Nachtsheim, P. R.; and Howe, J. T.  
Reflecting Ablating Heat Shields for Planetary Entry. American Institute of Aeronautics and Astronautics. Aerospace Sciences Meeting, 10th, San Diego, Calif., Jan 17-19, 1972. AIAA Paper 72-89.
965. Rakich, J. V.; and Mateer, G. G.  
Calculation of Metric Coefficients for Streamline Coordinates. AIAA Journal, vol. 10, Nov. 1972, p. 1538-1540.
966. Rakich, J. V.; and Kutler, P.  
Comparison of Characteristics and Shock Capturing Methods with Application to the Space Shuttle Vehicle. American Institute of Aeronautics and Astronautics. Aerospace Sciences Meeting, 10th, San Diego, Calif., Jan. 17-19, 1972. AIAA Paper 72-191.
967. Rehfuss, D. E.; and Larson, H. K.  
Cross-Hatching at Silver Spur. Nature: Physical Science, vol. 245, Sept. 24, 1973, p. 56-57.
968. Rizzi, A. W.; and Inouye, M.  
Time-Split Finite-Volume Method for Three-Dimensional Blunt-Body Flow. AIAA Journal, vol. 11, Nov. 1973, p. 1478-1485.  
(Also published as AIAA Paper 73-133)
969. Rossow, V. J.; Clements, H. G.; and Denardo, B. P.  
A Study of Wire-Deploying Devices Designed to Trigger Lightning. Journal of Spacecraft and Rockets, vol. 9, Sept. 1972, p. 631-632.
970. Rubesin, M. W.; and Inouye, M.  
Forced Convection, External Flows. In Handbook of Heat Transfer. Rohsenow, W. M. and Harnett, J. P., Editors. New York, N. Y., McGraw-Hill Book Co., 1973. p. 8-1 - 8-194.

971. Schiff, L. B.  
Computation of Supersonic Flow Fields about Bodies in Coning Motion Using a Shock-Capturing Finite-Difference Technique. American Institute of Aeronautics and Astronautics. Aerospace Sciences Meeting, 10th, San Diego, Calif., Jan. 17-19, 1972. AIAA Paper 72-27.
972. Schiff, L. B.  
Nonlinear Aerodynamics of Bodies in Coning Motion. AIAA Journal, vol. 10, Nov. 1972, p. 1517-1522.
973. Shepard, C. E.  
Advanced High-Power Arc Heaters for Simulating Entries into the Atmospheres of the Outer Planets. AIAA Journal, vol. 10, Feb. 1972, p. 117-118.
974. Spreiter, J. R.; and Rizzi, A. W.  
The Martian Bow Wave - Theory and Observation. Planetary and Space Science, vol. 20, Feb. 1972, p. 205-208.
975. Steger, J. L.; and Klineberg, J. M.  
A Finite-Difference Method for Transonic Airfoil Design. AIAA Journal, vol. 11, May 1973, p. 628-635.  
(Also published as AIAA Paper 72-679)
976. Steger, J. L.; and Baldwin, B. S.  
Shock Waves and Drag in the Numerical Calculation of Compressible, Irrotational Transonic Flow. AIAA Journal, vol. 11, July 1973, p. 903-904.
977. Steger, J. L.; and Lomax, H.  
Transonic Flow About Two-Dimensional Airfoils by Relaxation Procedures. AIAA Journal, vol. 10, Jan. 1972, p. 49-54.
978. Tannehill, J. C.; Mohling, R. A.; and Rakich, J. V.  
Numerical Computation of the Hypersonic Rarefied Flow Near the Sharp Leading Edge of a Flat Plate. American Institute of Aeronautics and Astronautics. Aerospace Sciences Meeting, 11th, Washington, D. C., Jan. 10-12, 1973. AIAA Paper 73-200.
979. Tobak, M.  
On Local Inflexional Instability in Boundary-Layer Flows. Zeitschrift für Angewandte Mathematik und Physik, vol. 24, May 25, 1973, p. 330-354.
980. VanDyke, M. D.  
The Supersonic Blunt-Body Problem - Review and Extension. In Eggers, A. J., Jr., Editor. Atmosphere entry. Vol. 1. New York, American Institute of Aeronautics and Astronautics, 1972. p. 42-53. (AIAA Reprint Series)



981. Vendell, E. W.; Park, C.; and Posch, R. E.  
Electrical Conductivity and Velocity of Highly Ionized Plasma Flows:  
Theory and Experiment. American Institute of Aeronautics and Astro-  
navitics. Fluid and Plasma Dynamics Conference, 5th, Boston, Mass.,  
June 26-28, 1972. AIAA Paper 72-671.
982. Vorreiter, J. W.; Pitts, W. C.; Stine, H. A.; and Burns, J. J.  
Atmosphere-Entry Behavior of a Modular, Disk-Shaped, Isotope Heat  
Source. In Intersociety Energy Conversion Engineering Conference, 8th,  
Philadelphia, Pa., Aug. 13-16, 1973. Proceedings. New York, N. Y.,  
American Institute of Aeronautics and Astronautics, Inc., 1973. p. 1-8,
983. Wakefield, R. M.; and Pearson, B. D., Jr.  
A Description of a General Use Automated Data Reduction System. In  
ICIASF '73; International Congress on Instrumentation in Aerospace  
Simulation Facilities, 5th, Pasadena, Calif., September 10-12, 1973.  
Record. New York, N. Y., Institute of Electrical and Electronics  
Engineers, Inc., 1973. p. 257-261.
984. Wakefield, R. M.; and Peterson, D. L.  
Graphite Ablation in Combined Convective and Radiative Heating.  
Journal of Spacecraft and Rockets, vol. 10, Feb. 1973, p. 149-154.
985. Wakefield, R. M.; and Peterson, D. L.  
A Study of Graphite Ablation in Combined Convective and Radiative  
Heating. American Institute of Aeronautics and Astronautics. Aero-  
space Sciences Meeting, 10th, San Diego, Calif., Jan. 17-19, 1972.  
AIAA Paper 72-88.
986. Warming, R. F.; Kutler, P.; and Lomax, H.  
Second- and Third-Order Noncentered Difference Schemes for Nonlinear  
Hyperbolic Equations. AIAA Journal, vol. 11, Feb. 1973, p. 189-195.
987. Weisbach, M. F.; and Chackerian, C., Jr.  
Linewidths and Transition Probabilities for the Carbon Monoxide Laser  
Lines. Journal of Chemical Physics, vol. 59, Oct. 15, 1973, p. 4272-  
4276.
988. Weston, K. C.; Howe, J. T.; and Green, M. J.  
Approximate Temperature Distribution for a Diffuse, Highly Reflecting  
Material. AIAA Journal, vol. 10, Sept. 1972, p. 1252-1254.
989. Whiting, E. E.; Arnold, J. O.; Page, W. A.; and Reynolds, R. M.  
Composition of the Earth's Atmosphere by Shock-Layer Radiometry During  
the PAET Entry Probe Experiment. Journal of Quantitative Spectroscopy  
and Radiative Transfer, vol. 13, Sept. 1973, p. 837-859.
990. Whiting, E. E.; Paterson, J. A.; Kovács, I.; and Nicholls, R. W.  
Computer Checking of Rotational Line Intensity Factors for Diatomic  
Transitions. Journal of Molecular Spectroscopy, vol. 47, July 1973,  
p. 84-98.

991. Williams, D. P.; and Nelson, H. G.  
Gaseous Hydrogen Embrittlement of Aerospace Materials. *Astronautical Research*, 1971, p. 323-330.  
(Also published in International Astronautical Federation. International Astronautical Congress, 22nd, Brussels, Sept. 20-25, 1971. Paper.)
992. Williams, D. P.  
A New Criterion for Failure of Materials by Environment-Induced Cracking. *International Journal of Fracture*, vol. 9, Mar. 1973, p. 63-74.
993. Williams, D. P.; and Evans, A. G.  
A Simple Method for Studying Slow Crack Growth. *Journal of Testing and Evaluation*, vol. 1, July 1973, p. 264-270.
994. Yoshikawa, K. K.  
Variational Solutions by the Use of Stepwise Constant Functions: I. Linear Case. *AIAA Journal*, vol. 10, Mar. 1972, p. 343-344.
995. Yoshikawa, K. K.  
Variational Solution to the Radiative Equation by the Use of a Step Function. II. Extension to Nonlinear Case by Iteration Method. *AIAA Journal*, vol. 11, Jan. 1973, p. 19-23.

#### PATENTS

996. Billman, K. W.; and Leonard, E. T.  
Alignment Apparatus Using a Laser having a Gravitationally Sensitive Cavity Reflector. Oct. 9, 1973.  
US-PATENT-3,764,220
997. Billman, K. W.  
Infrared Tunable Laser. Aug. 14, 1973.  
US-PATENT-3,753,148
998. Billman, K. W.; Rowley, P. D.; Stallcop, J. R.; and Presley, L. L.  
Method and Apparatus for Determining Properties of a Plasma. Dec. 26, 1972.  
US-PATENT-APPL-SN-318151
999. Goldstein, H. E.; Smith, M.; and Leiser, D.  
Silica Reusable Surface Insulation Patent Application. Dec. 26, 1973.  
US-PATENT-APPL-SN-427775
1000. Jedlicka, J. R.; Guist, L. R.; and Beam, R. M.  
Solid Medium Thermal Engine. Feb. 27, 1973.  
US-PATENT-APPL-SN-336319

1001. McKenzie, R. L.  
Diatomic Infrared Gasdynamic Laser. Apr. 26, 1971.  
US-PATENT-APPL-SN-137391

VEHICLE ENVIRONMENT DIVISION

FORMAL REPORTS

1002. Aerospace Mechanisms Symposium, 6th, Ames Research Center, Moffett Field, Calif., Sept. 9-10, 1971. Hertzl, G. G., Editor. Moffett Field, Calif., Ames Research Center, June 1972.  
NASA TM-X-2557 N72-26377
1003. Anderson, D. L.; Cunningham, B. E.; Dahms, R. G.; and Morgan, R. G. Particle Impact and Optical Property Analysis of the Surface of Surveyor II Materials. In Analysis of the Surveyor III Materials and Photos Returned by Apollo 12. 1972. p. 76-89.  
NASA SP-284 N72-26740
1004. Anderson, D. L.; Cunningham, B. E.; and Dahms, R. G. Radiation Degradation Analysis of Surveyor III Material. Progress in Astronautics and Aeronautics. Vol. 29. Fundamentals of Spacecraft Thermal Design. 1972. p. 205-220.
1005. Compton, D. L. Convective Heating Measurement by Means of an Infrared Camera. In Space Shuttle Aerothermodynamics Technology Conference, Moffett Field, Calif., Dec. 15-16, 1971. Vol. 2. Heating. Feb. 1972, p. 645-660.  
NASA TM-X-2507 N72-20868
1006. DeRose, C. E.; and Lockman, W. K. Aerodynamic Heating of a Space Shuttle Delta-Wing Booster at Free Stream Mach 7.4. Aug. 1971.  
NASA TM-X-62058 N71-36354
1007. Gilbreath, W. P. Preliminary Studies of the Oxidation of TD Ni-20Cr in Static, Flowing, and Dissociated Oxygen at 1100 C and 130 N/sq m. Aug. 1971.  
NASA TM-X-62064 N71-33102
1008. Gloria, H. R.; Pitts, J. N., Jr.; Behar, J. V.; Bradburn, G. A.; Reinisch, R. F.; and Zafonte, L. Airborne Measurements of Air Pollution Chemistry and Transport. I. Initial Survey of Major Air Basins in California. Sept. 30, 1972.  
NASA TM-X-69504 N73-31581
1009. Hanson, R. K.; Presley, L. L.; and Williams, E. V. Numerical Solutions of Several Reflected Shock-Wave Flow Fields with Nonequilibrium Chemical Reactions. Aug. 1972.  
NASA TN-D-6885 N72-29232

1010. Heinemann, K.  
In-Situ Measurement of Objective Lens Data of a High-Resolution  
 Electron Microscope. Feb. 1971. N71-19795  
 NASA TM-X-62018
1011. Intrieri, P. F.; and Kirk, D. B.  
 Ballistic Range Measurements of the Drag and Static and Dynamic  
 Stability of a Recoverable Space Shuttle Booster Vehicle. May 1972. N72-24926  
 NASA TM-X-62124
1012. Kunieda, H.  
 Nonlinear Axisymmetric Flexural Vibration of Spherical Shells. Apr.  
 1972. N72-22916  
 NASA TN-D-6776
1013. McClenahan, J. D.  
 Calibration of Radiation Detectors in the Ultraviolet Region Between  
 972 and 2500 Å. Sept. 1972. N72-32474  
 NASA TN-D-6991.
1014. McClenahan, J. D.  
 Vacuum Ultraviolet Line Radiation Measurements of a Shock-Heated  
 Nitrogen Plasma. Aug. 1972. N72-29707  
 NASA TN-D-6920
1015. Morrison, R. H.  
 A Preliminary Investigation of Projectile Shape Effects in Hypervelocity  
 Impact of a Double-Sheet Structure. Aug. 1972. N72-29922  
 NASA TN-D-6944
1016. Nelson, H. G.  
 The Kinetic and Mechanical Aspects of Hydrogen-Induced Failure in  
 Metals. Apr. 1972. N72-21537  
 NASA TN-D-6691
1017. Nelson, H. G.  
 Testing for Hydrogen Embrittlement: Primary and Secondary Influences.  
 Aug. 1972. N72-31548  
 NASA TM-X-62173
1018. Sammonds, R. I.  
 Dynamics of High-Drag Probe Shapes at Transonic Speeds. Sept. 1971. N71-33244  
 NASA TN-D-6489
1019. Wei, R. P.; Novak, S. R.; and Williams, D. P.  
 Some Important Considerations in the Development of Stress Corrosion  
 Cracking Test Methods. In AGARD Specialists Meeting on Stress Corro-  
 sion Testing Methods, Brussels, Jan. 1972. London, 1972. p. 5-1 - 5-8.  
 (AGARD Conference Proceedings, no. 98) N72-21905  
 (Also Published as NASA TM-X-68303)

1020. Wilkins, M. E.; and Chapman, G. T.  
Free Flight Determination of Boundary Layer Transition on Small Scale  
Cones in the Presence of Surface Ablation. Aug. 3, 1972.  
NASA TM-X-68867 N73-12293
1021. Wilkins, M. E.  
Sonic Boom Effect on Fish: Observations. May 1972.  
NASA TM-X-62163 N72-24065

#### NASA CONTRACTOR REPORTS

1022. Anbar, M.; and St. John, G. A.  
Study of Mechanisms Controlling the Ultraviolet Photochemistry of  
Associated and Polymeric Systems. Final Report, 20 Apr. 1970-9 Apr.  
1971. Oct. 1971.  
NASA CR-1935 N71-36520
1023. Cook, W. J.  
Prediction and Measurement of Heat Transfer Rates for the Shock-Induced  
Unsteady Laminar Boundary Layer on a Flat Plate. (Iowa State Univ. of  
Science and Technology, Ames; NGR-ISI-005, ISU-20.) Oct. 1972.  
NASA CR-114582 N73-31241

#### JOURNAL ARTICLES, MEETING PAPERS, BOOKS AND CHAPTERS OF BOOKS

1024. Anbar, M.; St. John, G. A.; Gloria, H. R.; and Reinisch, R. F.  
The Effect of State of Condensation on the Ionization Potential of  
Associated Liquids. In Water Structure at the Water-Polymer Interface.  
Jellinck, H. H. G., Editor. N. Y., Plenum Press, 1972. p. 85-105.
1025. Anderson, D. L.; Cunningham, B. E.; Dahms, R. G.; and Morgan, R. G.  
X-Ray Probe, SEM, and Optical Property Analysis of the Surface Features  
of Surveyor III Materials. In Lunar Science Conference, 2nd, Houston,  
Tex., Jan. 11-14, 1971. Proceedings. Cambridge, Mass., MIT Press,  
1971. Vol. 3, p. 2753-2765.
1026. Androes, G. M.; Gloria, H. R.; and Reinisch, R. F.  
Concerning the Production of Free Radicals in Proteins by Ultraviolet  
Light. Photochemistry and Photobiology, vol. 15, Apr. 1972, p. 375-393.
1027. Arnold, J. O.; and Nicholls, R. W.  
A Shock Tube Determination of the Electronic Transition Moment of the  
CN Red Band System. Journal of Quantitative Spectroscopy and Radiative  
Transfer, vol. 12, Oct. 1972, p. 1435-1452.

1028. Bar-Nun, A.; Bar-Nun, N.; Bauer, S. H.; and Sagan, C.  
Shock Synthesis of Amino Acids in Simulated Primitive Environments. In Chemical Evolution and the Origin of Life; Proceedings of the 3rd International Conference, Pont-a-Mousson, France, Apr. 19-25, 1970. Buvet, R.; and Ponnamparuma, C., Editors. Vol. 1. Molecular Evolution. Amsterdam, North-Holland Publishing Co., 1971. p. 114-122.
1029. Bar-Nun, A.; and Tauber, M. E.  
'Thunder': Shock Waves in Pre-Biological Organic Synthesis. Space Life Sciences, vol. 3, June 1972, p. 254-259.
1030. Boitnott, C. A.; and Savage, H. F.  
Light-Emission Measurements of Iron at Simulated Meteor Conditions. Astrophysical Journal, vol. 174, May 15, 1972, p. 201-206.
1031. Chackerian, C., Jr.  
The Dissociation of Shock Heated Carbon Monoxide Studied by Two Wavelength Infrared Emission. In International Shock Tube Symposium, 8th, Imperial College of Science and Technology, London, England, July 5-8, 1971. Preprints. London, 1971. p. 40-1 - 40-8.
1032. Chien, K.-Y.  
Application of the  $S_n$  Method to Spherically Symmetric Radiative-Transfer Problems. n AIAA Journal, vol. 10, Jan. 1972, p. 55-59.
1033. Ciffone, D. L.; and Borucki, J. G.  
Spectral Measurements of Nitrogen Continuum Radiation Behind Incident Shocks at Speeds up to 13 km/sec. Journal of Quantitative Spectroscopy and Radiative Transfer, vol. 11, Sept. 1971, p. 1291-1310.
1034. Donovan, T. M.; and Heinemann, K.  
High-Resolution Electron Microscope Observation of Voids in Amorphous Ge. Physical Review Letters, vol. 27, Dec. 27, 1971, p. 1794-1796.
1035. Edelson, S.; Mayfield, E. B.; and Shimabukuro, F.  
Polarized Solar Radio Emission at mm Wavelengths Associated with Sunspot Magnetic Fields. Nature: Physical Science, vol. 232, July 26, 1971, p. 82-84.
1036. Ehler, W.  
Measurement of Debye Length in Laser-Produced Plasma. Physics of Fluids, vol. 16, Feb. 1973, p. 339-340.
1037. Goorvitch, D.; and McClenahan, J. O.  
An Instrument for the Simultaneous Detection of the  $O_I$  Ground State ( $2p^4 \ ^3P$ ) and First Metastable State ( $2p^4 \ ^1D$ ) Populations. Review of Scientific Instruments, vol. 43, Dec. 1972, p. 1844-1846.
1038. Goorvitch, D.; and Valero, F. P. J.  
Vacuum-Ultraviolet Spectrum of Neutral Boron ( $B_I$ ). Astrophysical Journal, vol. 171, Feb. 1, 1972, p. 643-645.

1039. Hanson, R. K.  
Experimental Study of Shock-Wave Reflection from a Thermally  
Accommodating Wall. *Physics of Fluids*, vol. 16, Mar. 1973, p. 369-374.
1040. Hanson, R. K.; and Baganoff, D.  
Improved Fast Response Pressure Gauge for Shock Reflection Studies in  
Ionized Gases. *Review of Scientific Instruments*, vol. 43, Mar. 1972,  
p. 394-399.
1041. Hanson, R. K.  
Ionization Relaxation Time Measurements in Neon. *Journal of Chemical  
Physics*, vol. 55, Oct. 1, 1971, p. 3601-3602.
1042. Hansen, R. K.; and Baganoff, D.  
Shock-Tube Study of Nitrogen Dissociation Rates Using Pressure Mea-  
surements. *AIAA Journal*, vol. 10, Feb. 1972, p. 211-215.
1043. Hanson, R. K.  
Shock-Tube Study of Vibrational Relaxation in Carbon Monoxide Using  
Pressure Measurements. *AIAA Journal*, vol. 9, Sept. 1971, p. 1811-1819.
1044. Heinemann, K.  
In-Situ Measurement of Objective Lens Data of a High-Resolution  
Electron Microscope. *Optik*, vol. 34, 1971, p. 113-128.
1045. Hirshberg, J.; Asbridge, J. R.; and Robbins, D. E.  
The Helium-Enriched Interplanetary Plasma from the Proton Flares of  
August/September, 1966. *Solar Physics*, vol. 18, June 1971, p. 313-320.
1046. Kubin, R. F.  
Second Virial Coefficients for the Polar Species in Steam. *Journal of  
Physical Chemistry*, vol. 76, Sept. 28, 1972, p. 2901-2906.
1047. Linlor, W. I.  
Interaction of High-Intensity Laser Radiation with Metals. In Sympo-  
sium on Electron, Ion, and Laser Beam Technology, 11th, University of  
Colorado, Boulder, Colo., May 12-14, 1971. Record. San Francisco,  
San Francisco Press, Inc., 1971. p. 659-664.
1048. Malcolm, G. N.; and Intrieri, P. F.  
Ballistic Range Investigation of Sonic-Boom Overpressures in Water.  
American Institute of Aeronautics and Astronautics. Fluid and Plasma  
Dynamics Conference, 5th, Boston, Mass., June 26-28, 1972. AIAA  
Paper 72-654.
1049. Mehlman-Balloffet, G.  
Note - Absorption of a Laser Light Pulse in a Dense Plasma. *Journal  
of Quantitative Spectroscopy and Radiative Transfer*, vol. 13, May 1973,  
p. 467-472.



1050. Nelson, H. G.; Williams, D. P.; and Stein, J. E.  
Environmental Hydrogen Embrittlement of an Alpha-Beta Titanium Alloy:  
Effect of Microstructure. Metallurgical Transactions, vol. 3, Feb.  
1972, p. 469-475.
1051. Nelson, H. G.; Tetelman, A. S.; and Williams, D. P.  
The Kinetic and Dynamic Aspects of Corrosion Fatigue in a Gaseous  
Hydrogen Environment. In Corrosion Fatigue Chemistry, Mechanics and  
Microstructure; Proceedings of the International Conference, Storrs,  
Conn., June 14-18, 1971. Houston, Tex., National Association of  
Corrosion Engineers, 1972. p. 359-365.
1052. Nier, A. O.; Hanson, W. B.; McElroy, M. B.; Seiff, A.; and  
Spencer, N. W.  
Entry Science Experiments of Viking 1975. Icarus, vol. 16, Feb.  
1972, p. 74-91.
1053. Page, W. A.; and Woodward, H. T.  
Radiative and Convective Heating During Venus Entry. AIAA Journal,  
vol. 10, Oct. 1972, p. 1379-1381.
1054. Poppa, H.; Moorhead, R. D.; and Heinemann, K.  
Experimental Approaches to Well Controlled Studies of Thin-Film  
Nucleation and Growth. Nuclear Instruments and Methods, vol. 102,  
Aug. 1, 1972, p. 521-538.
1055. Savage H. F.; and Boitnott, C. A.  
Light Emission Measurements of Calcium and Magnesium at Simulated  
Meteor Conditions. I. Cross-Section Measurements. Astrophysical  
Journal, vol. 167, July 15, 1971, p. 341-348.
1056. Stallcop, J. R.  
Corrections to Vibrational Transition Probabilities Calculated from a  
Three-Dimensional Model. Journal of Chemical Physics, vol. 56,  
May 1, 1972, p. 4505-4512.
1057. Stallcop, J. R.  
N<sub>2</sub><sup>+</sup> Potential-Energy Curves. Journal of Chemical Physics, vol. 54,  
Mar. 15, 1971, p. 2602-2605.  
(Also published as NASA TM-X-66996)
1058. Stallcop, J. R.  
Semiclassical Vibration-Rotation Transition Probabilities for Motion  
in Molecular State Averaged Potentials. Chemical Physics Letters,  
vol. 12, Dec. 1, 1971, p. 30-34.
1059. Valero, F. P. J.; and Goorvitch, D.  
The Spectra of Highly Ionized Aluminum (Al vi-x) in the Extreme-  
Ultraviolet and Soft X-Ray Regions. Astrophysical Journal, vol. 178,  
Nov. 15, 1972, p. 271-276.

1060. Wei, R. P.; Novak, S. R.; and Williams, D. P.  
Some Important Considerations in the Development of Stress Corrosion  
Cracking Test Methods. *Materials Research and Standards*, vol. 12,  
Sept. 1972, p. 25-30.
1061. Weisbach, M. F.; and Chackerian, C., Jr.  
CW Operation in some CO Lines Below 5.0  $\mu$ . *IEEE Journal of Quantum  
Electronics*, vol. QE-8, July 1972, p. 679.
1062. Weisbach, M. F.; and Ahlstrom, H. G.  
Dynamics of the Inverse Pinch. *Physics of Fluids*, vol. 15, Aug. 1972,  
p. 1459-1468.
1063. Williams D. P.; and Nelson, H. G.  
Discussion of 'Evaluation of Hydrogen Embrittlement Mechanisms.'  
*Metallurgical Transactions*, vol. 2, July 1971, p. 1987-1989.
1064. Williams D. P.; and Nelson, H. G.  
Gaseous Hydrogen Embrittlement of Aerospace Materials. In Interna-  
tional Astronautical Federation. *International Astronautical Congress*,  
22nd, Brussels, Belgium, Sept. 20-25, 1971. Paper.
1065. Williams, D. P.; and Nelson, H. G.  
Gaseous Hydrogen-Induced Cracking of Ti-5Al-2.5Sn. *Metallurgical  
Transactions*, vol. 3, Aug. 1972, p. 2107-2113.

#### PATENTS

1066. Cole, H. A., Jr.  
Method and Apparatus for Measuring the Damping Characteristics of a  
Structure. Nov. 16, 1971.  
US-PATENT-3,620,069
1067. Feinstein, L.; and Hruby, R. J.  
Method and Apparatus for Swept-Frequency Impedance Measurements of  
Welds. Nov. 30, 1971.  
US-PATENT-3,624,496
1068. McClenahan, J. O.  
High Speed Shutter. June 30, 1972.  
US-PATENT-APPL-SN-267768
1069. McClenahan, J. O.  
Photomultiplier Circuit Including Means for Rapidly Reducing the  
Sensitivity Thereof. Nov. 28, 1972  
US-PATENT-APPL-SN-310193

DEVELOPMENT DIRECTORATE

PATENTS

1070. Foster, J. V.  
Magnetic Position Detection Method and Apparatus. Nov. 30, 1971.  
US-PATENT-3,624,598

ADVANCED SPACE PROJECTS OFFICE

NASA CONTRACTOR REPORTS

1071. Anon.  
Study of the Adaptability of Existing Hardware Designs to a Pioneer Saturn/Uranus Probe. Final Report, 26 Mar.-31 Oct. 1973. (MCR-73-291, Martin Marietta Corp., Denver, Colo.; NAS2-7488.) Oct. 1973.  
NASA CR-137650 N75-18287
1072. Anon.  
Study to Adapt Solar Electric Propulsion to the Pioneer F and G Spacecraft. Final Report. (TRW-22125-6001-RO-00, TRW Systems Group, Redondo Beach, Calif.; NAS2-6796.) Oct. 15, 1972.  
NASA CR-114514 N73-11798
1073. Gates, R. F.; Flannery, J. V.; and Cragin, J. T.  
Feasibility Test for a V-Slit Star Mapper for Pioneer Spacecraft Terminal Navigation. Final Report. (R-7537-2-451, TRW Systems Group, Redondo Beach, Calif.; NAS2-7597.) Nov. 1973.  
NASA CR-114734 N74-17384
1074. Laverty, N. P.  
Feasibility Test of a Solid State Spin-Scan Photo-Imaging System. (TRW-23671-6001-TU-00, TRW Systems Group, Redondo Beach, Calif.; NAS2-7592.) Dec. 14, 1973.  
NASA CR-114733 N74-17158
1075. Sellen, J. M., Jr.; Cole, R. K.; Kemp, R. F.; Hall, D. F.; and Shelton, H.  
Solar Electric Propulsion/Instrument/Subsystem Interaction Study. Final Report. (TRW-22878-6007-RU-00, TRW Systems, Redondo Beach, Calif.; NAS2-6940.) Mar. 30, 1973.  
NASA CR-114732 N74-17508

FLIGHT PROJECT DEVELOPMENT DIVISION

FORMAL REPORTS

1076. Kirkpatrick, J. P.  
Variable Conductance Heat Pipes from the Laboratory to Space. July  
1973.  
NASA TM-X-62290 N73-28917
1077. Schlitt, K. R.  
Design and Testing of a Passive, Feedback-Controlled, Variable  
Conductance Heat Pipe.  
NASA TM-X-62293 N73-28920

NASA CONTRACTOR REPORTS

1078. Bergquist, L. E.  
Chemical Pump Study. (Martin Marietta Corp., Denver, Colo.; NAS2-  
7383.) June 1973.  
NASA CR-114594 N73-25518
1079. Brown, W. A.; Kumer, J. B.; and Cooper, C. E., Jr.  
Density and Optical Properties of SPARCS Plumes. (Lockheed Missiles  
and Space Co., Palo Alto, Calif.; NAS2-6573.) Nov. 1972.  
NASA CR-114508 N73-12958
1080. Depew, C. A.; Sauerbrey, W. J.; and Benson, B. A.  
Construction and Testing of a Gas-Loaded, Passive-Control, Variable-  
Conductance Heat Pipe. Final Report. (M-4-26-73, Washington Univ.,  
Seattle; NASA ORDER A-52728-A.) Apr. 1973.  
NASA CR-114597 N73-30884
1081. Edwards, D. K.; Fleischman, G. L.; and Marcus, B. D.  
Theory and Design of Variable Conductance Heat Pipes: Steady State and  
Transient Performance. (REPT-3, TRW Systems Group, Redondo Beach,  
Calif.; NAS2-5503.) Dec. 1972.  
NASA CR-114530 N73-15957
1082. Edwards, D. K.; Fleischman, G. L.; and Marcus, B. D.  
User's Manual for the TRW Gaspipe 2 Program (A Vapor-Gas Front Analysis  
Program for Heat Pipes containing Non-Condensable Gas). (TRW-13111-  
6054-RO-00, TRW Systems Group, Redondo Beach, Calif.; NAS2-5503.)  
Oct. 1973.  
NASA CR-114672 N74-13663
1083. Fairchild, M. K.; and Hartmann, R. A.  
Skylab S071/S072 Circadian Periodicity Experiment. Final Report.  
(NORT-73-320, Northrop Corp., Beverly Hills, Calif.; NAS2-6897.)  
Nov. 1973.  
NASA CR-114706 N74-14847

1084. Feinler, E. J.; and Hubbard, R. W.  
Survey of Techniques Used to Preserve Biological Materials. (SRI PROJ.  
LSU-8930, Stanford Research Inst., Menlo Park, Calif.; NAS2-6201.)  
Jan. 1972.  
NASA CR-114422 N72-18080
1085. Goldfischer, L. I.  
Venus Wind-Altitude Radar Study. Phase 1, Final Report. (Y256E012,  
Singer-Kearfott, Pleasantville, N.Y.; NAS2-7255.) Jan. 1973.  
NASA CR-114556 N73-25871
1086. Haefner, K. B.; and Honda, T. S.  
Fluidic Emergency Roll Control System. Final Report. (General Elec-  
tric Co., Schenectady, N.Y.; NAS2-5467.) Mar. 1973.  
NASA CR-114588 N74-10048
1087. Honda, T. S.  
Fluidic Emergency Thruster for Aircraft. (General Electric Co., Sche-  
nectady, N.Y.; NAS2-5467.) Nov. 1972.  
NASA CR-114490 N73-12041
1088. Jelinek, F.  
Study of Sequential Decoding. Final Report. (Cornell Univ., Ithaca,  
N.Y.; NAS2-5643.) Feb. 1972.  
NASA CR-114450 N72-28198
1089. Jones, T. B.; and Perry, M. P.  
Electrohydrodynamic Heat Pipe Research. (RR-4, Colorado State Univ.,  
Fort Collins; NGR-06-002-127.) July 1973.  
NASA CR-114646 N73-31839
1090. Jones, T. B.; and Perry, M. P.  
Entrainment in Electrohydrodynamic Heat Pipes. (RR-2, Colorado State  
University, Fort Collins; NGR-06-002-127.) Aug. 1972.  
NASA CR-114499 N73-12961
1091. Jones, T. B.; and Perry, M. P.  
Experiments with an Electrohydrodynamic Heat Pipe. (RR-3, Colorado  
State Univ., Fort Collins; NGR-06-002-127.) Sept. 1972.  
NASA CR-114498 N73-12960
1092. Kirkpatrick, A. R.  
Silicon Solar Cell Development and Radiation Effects Study for Low  
Temperature and Low Illumination Intensity Operation. Vol. 2. (Ion  
Physics Corp., Burlington, Mass.; NAS2-5516.) Jan. 1972.  
NASA CR-114429 N72-26033

1093. Marcus, B. D.  
Theory and Design of Variable Conductance Heat Pipes. Apr. 1972.  
NASA CR-2018 N72-23953
1094. Marcus, B. D.; Edwards, D. K.; and Anderson, W. T.  
Variable Conductance Heat Pipe Technology. (RR-4, TRW Systems Group,  
Redondo Beach, Calif.; NAS2-5503.) Dec. 1973.  
NASA CR-114686 N74-17643
1095. Odenwalder, J. P.; Viterbi, A. J.; Jacobs, I. M.; and Heller, J. A.  
Study of Information Transfer Optimization for Communication  
Satellites. Final Report. (Linkabit Corp., San Diego, Calif.; NAS2-  
6810.) Jan. 3, 1973.  
NASA CR-114561 N73-20889
1096. Payne, P. A.  
Part Specification Solar Cells, Silicon N-ON-P Solderless Low  
Temperature Operation for Jupiter Missions. (Heliotek, Sylmar, Calif.;  
NAS2-5519.) Apr. 3, 1972.  
NASA CR-114476 N72-27066
1097. Payne, P. A.  
Research and Development of Silicon Solar Cells for Low Solar Intensity  
and Low Temperature Applications. Final Report. (Heliotek, Sylmar,  
Calif.; NAS2-5519.) Feb. 1972.  
NASA CR-114475 N72-27065
1098. Rinehart, W. A.; Land, D. W.; Painter, J. H.; and Williamson, R. A.  
Cyclical Tests of Selected Space Shuttle TPS Metallic Materials in a  
Plasma Arc Tunnel. Vol. 1. Description of Tests and Program Summary.  
Final Report. (MDC-Q0473-VOL-1, McDonnell-Douglas Corp., St. Louis;  
NAS2-6601.) June 1972.  
NASA CR-114459 N74-14191
1099. Rinehart, W. A.; Land, D. W.; Painter, J. H.; and Williamson, R. A.  
Cyclical Tests of Selected Space Shuttle TPS Metallic Materials in a  
Plasma Arc Tunnel. Vol. 2. Appendices - Data Tabulation. Final Report.  
(MDC-Q0473-VOL-2, McDonnell-Douglas Corp., St. Louis; NAS2-6601.)  
June 1972.  
NASA CR-114520 N74-14192
1100. Rotheram, M.  
Chemical Pump Study for Pioneer Venus Program. Final Report. (Perkin-  
Elmer Corp., Pomona, Calif.; NAS2-7380.) 1973.  
NASA CR-114604 N73-25519
1101. Rudolf, W. P.; and Reed, D. R.  
Star Field Attitude Sensor Study for the Pioneer Venus Spacecraft.  
(Lockheed Missiles and Space Co., Sunnyvale, Calif.; NAS2-7171.) Nov.  
1972.  
NASA CR-114516 N73-12924

1102. Saaski, E. W.  
Investigation of Bubbles in Arterial Heat Pipes. (McDonnell-Douglas  
Astronautics Co., Richland, Wash.; NAS2-6991.) Dec. 1972.  
NASA CR-114531 N73-15958
1103. Swerdling, B.; and Kosson, R.  
Design, Fabrication, and Testing of a Thermal Diode. Final Report,  
1 Jul. 1971-15 Nov. 1972. (Grumman Aerospace Corp., Bethpage, N.Y.;  
NAS2-6493.) Nov. 1972.  
NASA CR-114526 N73-17915
1104. Thomas, N. C.; and Crosmer, W. E.  
Pioneer Venus Mechanical Roots Pump Test and Evaluation. Final Report.  
(BSR-4090, Bendix Corp., Ann Arbor, Mich.; NAS2-7384.) Sept. 1973.  
NASA CR-114660 N73-31448
1105. Thomas, N. C.; Crosmer, W. E.; and Nowak, D.  
A Study of the Feasibility of Mechanical Pumps for Use with the  
Pioneer-Venus Probe Mass Spectrometer Inlet System. Final Report, 7  
Feb.-7 Apr. 1973. (BSR-4036, Bendix Corp., Ann Arbor, Mich.; NAS2-7384.)  
Apr. 1973.  
NASA CR-114581 N73-23551
1106. White, K. P., III.  
Solar Flare Forecasts Based on mm-Wavelength Measurements. (ATR-73  
(8102)-4, Aerospace Corp., El Segundo, Calif.; NAS2-6654.) Oct. 25,  
1972.  
NASA CR-114510 N73-11815
1107. White, K. P., III.  
Solar Flare Predictions and Warnings. Final Report. (ATR-73 (7265)  
-1, Aerospace Corp., El Segundo, Calif.; NAS2-6654.) Oct. 1, 1972.  
NASA CR-114511 N73-11814
1108. White, K. P., III; and Mayfield, E. B.  
Solar Flare Predictions and Warnings. Final Report. (Aerospace Corp.,  
El Segundo, Calif.; NAS2-7292.) July 6, 1973.  
NASA CR-114635 N73-31707
1109. Wichmann, H.  
Study of Multiple Cycles Valves. (S-1262, Marquardt Corp., Van Nuys,  
Calif.; NAS2-7361.) May 1973.  
NASA CR-114627 N73-25517

JOURNAL ARTICLES, MEETING PAPERS, BOOKS AND CHAPTERS OF BOOKS

1110. Blakely, R. J.; Cox, A.; and Iufer, E. J.  
Vector Magnetic Data for Detecting Short Polarity Intervals in Marine  
Magnetic Profiles. Journal of Geophysical Research, vol. 78, Oct. 10,  
1973, p. 6977-6983.



1111. Cheng, D. Y.; Wang, P.; and Chisel, D. M.  
Experimental Study on Optimization Parameters of a Supersonic Jet  
Ejector Thrust Augmentor. *Journal of Aircraft*, vol. 10, Sept. 1973,  
p. 569-570.
1112. Cramer, R. L.  
Traffic Study of a Computer System. In Asilomar Conference on Circuits  
and Systems, 6th, Pacific Grove, Calif., Nov. 15-17, 1972. Conference  
Record. North Hollywood, Calif., Western Periodicals Co., 1973. p.  
179-186.
1113. Hofman, L. B.  
Performance Results for a Hybrid Coding System. In International  
Telemetry Conference, Washington, D.C., Sept. 27-29, 1971. Proceed-  
ings. v.7, 1971. p. 464-476.
1114. Intrieri, P. F.; and Malcolm, G. N.  
Ballistic Range Investigation of Sonic-Boom Overpressures in Water.  
*AIAA Journal*, vol. 11, Apr. 1973, p. 510-516.
1115. Iufer, E. J.  
Magnetic Field Sensors. *ISA Transducer Compendium*. 2nd Ed. Part III.  
Electrical Output, Sensory Transducers. Harvey, G. F., Editor.  
Pittsburgh, Instrument Society of America, 1972. p. 160-165.
1116. Kirkpatrick, J. P.; Brennan, P. J.  
Advanced Thermal Control Flight Experiment. *American Institute of  
Aeronautics and Astronautics, Thermophysics Conference*, 8th, Palm  
Springs, Calif., July 16-18, 1973. *AIAA Paper 73-757*. (Also  
published in *Progress in Astronautics & Aeronautics*, v. 35. Thermo-  
physics and Spacecraft Thermal Control. Cambridge, Mass., MIT Press,  
1974. p. 409-430.)
1117. Kirkpatrick, J. P.; and Marcus, B. D.  
A Variable Conductance Heat-Pipe Flight Experiment. *Progress in  
Astronautics and Aeronautics*, vol. 29, 1972, p. 505-527.
1118. Kirkpatrick, J. P.; and Marcus, B. D.  
A Variable Conductance Heat Pipe/Radiator for the Lunar Surface Magneto-  
meter. *Progress in Astronautics and Aeronautics*, vol. 31, 1973,  
p. 83-102.  
(Also published as *AIAA Paper 72-271*)
1119. Noble, S. C.; Knauer, S. C.; and Glem, J. I.  
A Real-Time Hadamard Transform System for Special and Temporal  
Redundancy Reduction in Television. In International Telemetry  
Conference, Washington, D.C., Oct. 9-11, 1973. Proceedings. v. 9,  
1973. p. 496.

1120. Osder, S. S.; Rouse, W. E.; and Young, L. S.  
Navigation, Guidance, and Control Systems for V/STOL Aircraft.  
Sperry Technology, vol. 1, no. 3, 1973, p. 34-41.
1121. Saaski, E. W.  
Gas Occlusions in Arterial Heat Pipes. American Institute of Aero-  
nautics and Astronautics. Thermophysics Conference, 8th, Palm Springs,  
Calif., July 16-18, 1973. AIAA Paper 73-724.  
(Also published as NASA CR-114531)
1122. Shillinger, G. L., Jr.; Von Baumgarten, R. J.; and Baldrighi, G.  
The Gravity Reference Response, the Rotation Sensation, and Other  
Illusory Sensations Experienced in Aircraft and Space Flight. Space  
Life Sciences, vol. 4, Sept.-Dec. 1973, p. 368-390.
1123. Vojvodich, N. S.  
PAET Entry Heating and Heat Protection Experiment. Journal of Space-  
craft and Rockets, vol. 10, March 1973, p. 181-189.
1124. Von Baumgarten, R. J.; Baldrighi, G.; Atema, J.; and Shillinger, G. L.,  
Jr.  
Behavioral Responses to Linear Accelerations in Blind Goldfish. I.  
The Gravity Reference Response. Space Life Sciences, vol. 3, Aug.  
1971, p. 25-33.
1125. Von Baumgarten, R.; Thuemler, R.; Shillinger, G. L.; and Baldrighi, G.  
Blickrichtungsänderungen bei Parabelflügen und Rektilinearen  
Beschleunigungen. (Changes in the Direction of Sight during Parabolic  
Flights and Rectilinear Accelerations.) In International Congress on  
Aviation and Space Medicine, 21st, Munich, West Germany, Sept. 17-21,  
1973. Preprints of Lectures. Munich, Sekretariat, Internationaler  
Kongress für Luft- und Raumfahrtmedizin, 1973. p. 97-98.
1126. Von Baumgarten, R. J.; Shillinger, G., Jr.; and Baldrighi, G.  
Illusory Sensations in Aircraft Flight and Weightlessness. Revue de  
Medecine Aeronautique et Spatiale, vol. 12, June 1973. p. 419-420.
1127. Von Baumgarten, R. J.; Baldrighi, G.; and Shillinger, G. L., Jr.  
Vestibular Behavior of Fish During Diminished G-Force and Weightless-  
ness. Aerospace Medicine, vol. 43, June 1972, p. 626-632.  
(Also published with title: Responses of Blind Fish to Gravitational  
Changes as Achieved in Parabolic Flight, as AGARD CP-109.)

#### PATENTS

1128. Chisel, D. M.  
Fluidic Proportional Thruster System. Oct. 12, 1971.  
US-PATENT-3,612,442

1129. Lorell, K. R.; and Murphy, J. P.  
All Sky Pointing Attitude Control System. Oct. 4, 1973.  
US-PATENT-APPL-SN-403695
1130. Zabower, H. R.  
Hand-Held Photomicroscope. Oct. 9, 1973.  
US-PATENT-3,764,209

PROJECT BIO-SATELLITE

JOURNAL ARTICLES, MEETING PAPERS, BOOKS AND CHAPTERS OF BOOKS

1131. Conrad, H. M.; and Yokoyama, K.  
Epinastic Thresholds in a Simulated Hypogravity Environment. *Physiologia Plantarum*, vol. 24, June 15, 1971, p. 426-430.

PROJECT PIONEER

FORMAL REPORTS

1132. Anon.  
Pioneer F and G Mission to Jupiter. 1973.  
NASA TM-X-69125 N73-20859
1133. Millard, J. P.; Green, M. J.; and Sommer, S. C.  
An Analytical Design of Sensors for Measuring Atmospheric Temperature  
During Terminal Phase of Planetary Entry. Aug. 1972.  
NASA TN-D-6947 N72-29471

NASA CONTRACTOR REPORTS

1134. Bergquist, L. E.  
Chemical Pump Study. (Martin Marietta Corp., Denver, Colo.; NAS2-7383.)  
June 1973.  
NASA CR-114594 N73-25518
1135. Botticelli, R. A.; Johnson, R. O.; and Wallmark, G. N.  
The Applicability of Frame Imaging from a Spinning Spacecraft. Vol. I.  
Summary Report. (CBS Laboratories, Stamford, Conn.; NAS2-7107.)  
June 30, 1973.  
NASA CR-114637 N74-17163
1136. Botticelli, R. A.; Johnson, R. O.; and Wallmark, G. N.  
The Applicability of Frame Imaging from a Spinning Spacecraft. Vol. II.  
Technical Report. (CBS Laboratories, Stamford, Conn.; NAS2-7107.)  
June 30, 1973.  
NASA CR-114638 N74-17164
1137. Goldfischer, L. I.  
Venus Wind-Altitude Radar Study. Phase 1, Final Report. (Singer-  
Kearfott, Pleasantville, N.Y.; NAS2-7255.) Jan. 1973.  
NASA CR-114556 N73-25871
1138. Lavery, N. P.  
Feasibility Test of a Solid State Spin-Scan Photo-Imaging System.  
(TRW-23671-6001-TU-00, TRW Systems Group, Redondo Beach, Calif.; NAS2-  
7592.) Dec. 14, 1973.  
NASA CR-114733 N74-17158
1139. Rotheram, M.  
Chemical Pump Study for Pioneer Venus Program. Final Report. (Perkin-  
Elmer Corp., Pomona, Ca; NAS2-7380.) 1973.  
NASA CR-114604 N73-25519

1140. Thomas, N. C.; and Crosmer, W. E.  
Pioneer Venus Mechanical Roots Pump Test and Evaluation. Final Report.  
(BSR-4090, Bendix Corp., Ann Arbor, Mich.; NAS2-7384.) Sept. 1973.  
NASA CR-114660 N73-31448
1141. Thomas, N. C.; Crosmer, W. E.; and Nowak, P.  
A Study of the Feasibility of Mechanical Pumps for Use with the  
Pioneer-Venus Probe Mass Spectrometer Inlet System. Final Report,  
7 Feb.-7 Mar. 1973. (BSR-4036, Bendix Corp., Ann Arbor, Mich.;  
NAS2-7384) Apr. 1973.  
NASA CR-114581 N73-23551
1142. Viskanta, V. Z.; and Rose, R. E.  
Conical Scanning System for Pioneer Jupiter Spacecraft. (TRW Systems  
Group, Redondo Beach, Calif.; NAS2-5600.) 1971.  
NASA CR-114374 N71-75956
1143. Wichmann, H.  
Study of Multiple Cycle Valves. (Marquardt Corp., Van Nuys, Calif.;  
NAS2-7361.) May 1973.  
NASA CR-114627 N73-25517

JOURNAL ARTICLES, MEETING PAPERS, BOOKS AND CHAPTERS OF BOOKS

1144. Dyer, J. W.; Nunamaker, R. R.; Cowley, J. R., Jr; and Jackson, R. W.  
Pioneer Venus Mission Plan for Atmospheric Probes and an Orbiter.  
AIAA, ASME, and SAE, Joint Space Mission Planning and Execution Meeting,  
Denver, Colo., July 10-12, 1973, AIAA Paper 73-579.
1145. Fimmel, R. O.; and Baker, T. E.  
A Spacecraft Computer Repairable via Command. IEEE Transactions on  
Aerospace and Electronic Systems, vol. AES-7, Sept. 1971, p. 974-981.
1146. Kochendorfer, F. D.; and Hall, C. F.  
The Pioneer F and G Missions. American Astronautical Society, Annual  
Meeting, 17th, Seattle, Wash., June 28-30, 1971. (Advances in the  
Astronautical Sciences. Vol. 29, The Outer Solar System. pt. 1.  
Tarzana, Calif., 1971. AAS Paper 71-101. p. 27-35).
1147. Weinberg, J. L.; Hanner, M. S.; Mann, H. M.; Hutchison, P. B.; and  
Fimmel, R.  
Observations of Zodiacal Light from the Pioneer 10 Asteroid-Jupiter  
Probe: Preliminary Results. In Space Research XIII; Proceedings of  
the 15th Plenary Meeting of COSPAR, Madrid, Spain, May 10-24, 1972.  
Berlin, Akademie-Verlag GMBH, 1973. Vol. 2. p. 1187-1192.

PATENTS

1148. Auer, S. O.  
Micrometeoroid Analyzer. Feb. 6, 1973.  
US-PATENT-3,715,590

RELIABILITY AND QUALITY ASSURANCE OFFICE

FORMAL REPORTS

1149. Anon.  
Parts, Materials, and Processes Experience Summary. Vol. I.  
(Supersedes NASA CR-114391)  
NASA SP-6507-VOL-1 N74-20070
1150. Anon.  
Parts, Materials, and Processes Experience Summary. Vol. II.  
(Supersedes NASA CR-114391)  
NASA SP-6507-VOL-2 N74-14140



SYSTEMS ENGINEERING DIVISION

FORMAL REPORTS

1151. Coombs, W. C.  
Estimation of Microwave Absorption in the Jupiter Atmosphere. Sept. 1971.  
NASA TM-X-62091 N72-11734
1152. Grant, T. L.; and Cramer, R. L.  
Effect of Oscillator Instability on Telemetry Signals. July 1971.  
NASA TN-D-6442 N71-29846
1153. Kirkpatrick, J. P.; Lewis, C. A.; and Gasper, J. C.  
A Comprehensive Computer Program for Predicting Solar Cell Performance. Feb. 1971.  
NASA TM-X-2220 N71-18474
1154. Lum, H., Jr.  
A High Speed Sequential Decoder. Dec. 1972.  
NASA TM-X-62241 N73-20222
1155. Polaski, L. J.; and Zabower, H. R.  
A Space Qualified Radiation Source Holder. In Aerospace Mechanisms Symposium, 6th, Ames Research Center, Moffett Field, Calif., 9-10, Sept., 1971. George G. Herzl, Editor. June 1972, p. 9-12.  
NASA TM-X-2557 N72-26379

NASA CONTRACTOR REPORTS

1156. Anon.  
Bioresearch Module Design Definition and Space Shuttle Vehicle Integration. Vol. 1. Technical Report. Final Report. (GE-RESD-N-72469-VOL-1, General Electric Co., Philadelphia, Pa.; NAS2-6523.) Dec. 15, 1971.  
NASA CR-114408 N72-26796
1157. Anon.  
Bioresearch Module Design Definition and Space Shuttle Vehicle Integration. Vol. 2. Preliminary Bioresearch Module Development Program Plan. Final Report. (GE-RESD-N-72469-VOL-2, General Electric Co., Philadelphia, Pa.; NAS2-6523.) Dec. 15, 1971.  
NASA CR-114409 N72-26797
1158. Anon.  
Bioresearch Module Design Definition and Space Shuttle Vehicle Integration. Vol. 3. Management and Funding Plan. Final Report. (GE-RESD-N-72469-VOL-3, General Electric Co., Philadelphia, Pa.; NAS2-6523.) Dec. 15, 1971.  
NASA CR-114410 N72-26798

1159. Davenport, J. W.; and De Wolf, D. A.  
Investigation of Line-of-Sight Propagation in Dense Atmosphere.  
Phase 2, Final Report, Jun. 1970 - Feb. 1971. (Radio Corp. of  
America, Princeton, N.J.; NAS2-5310.) July 1971.  
NASA CR-114288 N71-30739
1160. De Wolf, D. A.; and Kaplan, G. S.  
Investigation of Line-of-Sight Propagation in Dense Atmosphere. Phase  
3, Part 1. Final Report, May-Oct. 1971. (PRRL-71-CR-42-PT-1, Radio  
Corp. of America, Princeton, N.J.; NAS2-5310.) Nov. 1971.  
NASA CR-114416 N72-19427
1161. Jones, T. B.  
The Feasibility of Electrohydrodynamic Heat Pipes. (RR-1, Colorado  
State Univ., Fort Collins; NGR-06-002-127.) Oct. 1971.  
NASA CR-114392 N72-13914
1162. Lang, A. L., Jr.  
Bioresearch Module Design Definition and Space Shuttle Vehicle  
Integration Study. Vol. 1. Basic Report. Final Progress Report.  
(T146-4-VOL-1, Vought Missiles and Space Co., Dallas, Tex.; NAS2-  
6524.) Dec. 17, 1971.  
NASA CR-114411 N72-26799
1163. Lang, A. L., Jr.  
Bioresearch Module Design Definition and Space Shuttle Vehicle  
Integration Study. Vol. 2. Appendices. Final Progress Report.  
(T146-4-VOL-2, Vought Missiles and Space Co., Dallas, Tex.; NAS2-  
6524.) Dec. 17, 1971.  
NASA CR-114412 N72-26800
1164. Odenwalder, J. P.; Gilhousen, K. S.; Heller, J. A.; Jacobs, I. M.;  
Jelinek, F.; and Viterbi, A. J.  
Hybrid Coding Systems Study. Final Report. (Linkabit Corp., San Diego,  
Calif.; NAS2-6722.) Sept. 1972.  
NASA CR-114486 N72-32206
1165. Saaski, E. W.  
Investigation of Bubbles in Arterial Heat Pipes. (McDonnell-Douglas  
Astronautics Co., Richland, Wash.; NAS2-6991) Dec. 1972.  
NASA CR-114531 N73-15958

JOURNAL ARTICLES, MEETING PAPERS, BOOKS AND CHAPTERS OF BOOKS

1166. Gilhousen, K. S.; and Lumb, D. R.  
A Very High Speed Hard Decision Sequential Decoder. In International Telemetering Conference, Los Angeles, Calif., Oct. 10-12, 1972. Proceedings. Woodland Hills, Calif., International Foundation for Telemetering, 1972. p. 499-506.  
(Also published in NTC '72; National Telecommunications Conference, Houston, Tex., Dec. 4-6, 1972. Record. New York, N.Y., Institute of Electrical and Electronics Engineers, Inc., 1972. p. 13C-1 - 13C-5.)
1167. Hansen, Q. M.; Young, L. S.; Rouse, W. E.; and Osder, S. S.  
Development of STOLAND, a Versatile Navigation, Guidance and Control System. American Institute of Aeronautics and Astronautics. Aircraft Design, Flight Test, and Operations Meeting, 4th, Los Angeles, Calif., Aug. 7-9, 1972. AIAA Paper 72-789.  
(Also published as NASA TM-X-62183)
1168. Hofman, L. B.; and Odenwalder, J. P.  
Hybrid and Concatenated Coding Applications. In International Telemetering Conference, Los Angeles, Calif., Oct. 10-12, 1972. Proceedings. Woodland Hills, Calif., International Foundation for Telemetering, 1972. p. 522-531.
1169. Lumb, D. R.; and Viterbi, A. J.  
High Data Rate Coding for the Space Station Telemetry Links. In International Telemetering Conference, Washington, D. C., Sept. 27-29, 1971. Proceedings. Woodland Hills, Calif., International Foundation for Telemetering, 1971. p. 101-106.
1170. Swerdling, B.; Kosson, R.; Urkowitz, M.; and Kirkpatrick, J.  
Development of a Thermal Diode Heat Pipe for the Advanced Thermal Control Flight Experiment (ATFE). American Institute of Aeronautics and Astronautics. Thermophysics Conference, 7th, San Antonio, Apr. 10-12, 1972. AIAA Paper 72-260.

PATENTS

1171. Streed, E. R.  
Solar Cell Patent. July 6, 1971.  
US-PATENT-3,591,420

LIFE SCIENCES DIRECTORATE

JOURNAL ARTICLES, MEETING PAPERS, BOOKS AND CHAPTERS OF BOOKS

1172. Klein, H. P.; Lederberg, J.; and Rich. A.  
Biological Experiments: The Viking Mars Lander. *Icarus*, vol. 16,  
Feb. 1972, p. 139-146.
1173. Klein, H. P.; and Vishniac, W.  
Biological Instrumentation for the Viking 1975 Mission to Mars. In  
Life Sciences and Space Research X; Proceedings of the 14th Plenary  
Meeting, Seattle, Wash., June 21-July 2, 1971. Berlin, East Germany,  
Akademie-Verlag, 1972. p. 201-210.
1174. Klein, H. P.  
Potential Targets in the Search for Extraterrestrial Life. *Exobiology*.  
Ponnampuruma, C., Editor. Amsterdam, North-Holland Publ. Co., 1972.  
p. 449-464.

BIOMEDICAL RESEARCH DIVISION

FORMAL REPORTS

1175. Greenleaf, J. E.  
Effects of Dehydration on Performance in Man: Annotated Bibliography.  
Dec. 1973.  
NASA TM-X-62308 N74-11891
1176. Harrison, G.; and Mackenzie, W.  
Ultrastructural Pathogenesis of Lesions Produced by Exposure to Oxygen  
Difluoride with Correlative Light Microscopy. July 1973.  
NASA TM-X-69865 N74-16829
1177. Jacobson, L. B.; Hyatt, K. H.; Sullivan, R. W.; Cantor, S. A.; Sandler,  
H.; Rositano, S. A.; and Mancini, R.  
Evaluation of  $+G_z$  Tolerance Following Simulated Weightlessness (Bedrest).  
Aug. 1973.  
NASA TM-X-62311 N74-10091
1178. Oyama, J.  
Effect of Artificial Gravity on Thermoregulation, Respiratory Metabolism  
and Intermediary Metabolism of Animals. Aug. 1973. In Holton, E. M.,  
Editor. Regulatory Biology: Depressed Metabolic States. Symposium  
held at Wallops Island, Va., 18-20 Oct., 1971, Aug. 1973. p. 27-51.  
NASA TM-X-69354 N74-14816
1179. Thompson, G. A.; Anliker, M.; and Young, D. R.  
Determination of Mechanical Properties of Excised Dog Radii from Lateral  
Vibration Experiments. 1973.  
NASA TM-X-70037 N74-22530
1180. Vernikos-Danellis, J.; Winget, C. M.; Leach, C. S.; and Rambaut, P. C.  
Dissociation of Effects of Prolonged Confinement and Bedrest in Normal  
Human Subjects; Cortisol, Insulin, Thyroxine, and Triiodothyronine.  
In Manned Spacecraft Center Endocrine Program Conference, 2nd Annual,  
Houston, Tex., Dec. 1971. Proceedings. Nov. 1972. p. 10-1 - 10-8.  
NASA TM-X-58093 N73-18114
1181. Winget, C. M.; Vernikos-Danellis, J.; Leach, C. S.; and Rambaut, P. C.  
Dissociation of Effects of Prolonged Confinement and Bedrest in Normal  
Human Subjects: Heart Rate and Body Temperature. In Manned Space-  
craft Center Endocrine Program Conference, 2nd Annual, Houston, Tex.,  
Dec. 1971. Proceedings. Nov. 1972. p. 9-1 - 9-13.  
NASA TM-X-58093 N73-18113
1182. Young, H. L.; Juhos, L.; Castle, B. L.; Yusken, J.; and Greenleaf,  
J. E.  
Body Water Compartments during Bed Rest: Evaluation of Analytical  
Methods. May 1973.  
NASA TR-R-406 N73-24133

NASA CONTRACTOR REPORTS

1183. Annis, J. F.; and Webb, P.  
The Development of an Elastic Reverse Gradient Garment to be used as a Countermeasure for Cardiovascular Deconditioning. (Webb Associates, Yellow Springs, Ohio; NAS2-7156.) Dec. 14, 1973.  
NASA CR-114685 N74-12784
1184. Anon.  
Information Services for Comparative Analysis of Biorhythm Research. Final Report. (George Washington Univ., Washington, D. C.; NAS2-6216.) May 1972.  
NASA CR-114487 N72-30070
1185. Kenyon, D. J.; Hamilton, R. W., Jr.; Colley, I. A.; and Schreiner, H. R.  
Predictive Modeling of Altitude Decompression Sickness in Humans. Final Report. (Union Carbide Research Inst., Tarrytown, N.Y.; NAS2-6697.) Dec. 19, 1972.  
NASA CR-114550 N73-16066
1186. Porter, R. A.; and Wentz, F. J., III.  
Study of Blood Flow Sensing with Microwave Radiometry. Final Report. (Radiometric Technology, Inc., Wakefield, Mass.; NAS2-7087.) Oct. 5, 1973.  
NASA CR-114675 N74-11889
1187. Snyder, M. F.; and Rideout, V. C.  
The Study of Human Venous System Dynamics Using Hybrid Computer Modeling. July 1972.  
NASA CR-2084 N72-28039
1188. van Beaumont, W.  
Objective Evaluation of Cutaneous Thermal Sensitivity. (St. Louis Univ., Mo.; NGR-26-006-039.) Oct. 1972.  
NASA CR-114564 N73-17113

JOURNAL ARTICLES, MEETING PAPERS, BOOKS AND CHAPTERS OF BOOKS

1189. Alderman, E. L.; Sandler, H.; Brooker, J. Z.; Sanders, W. J.; Simpson, C.; and Harrison, D. C.  
Light-Pen Computer Processing of Video Image for the Determination of Left Ventricular Volume. Circulation, vol. 47, Feb. 1973, p. 309-316.
1190. Amtmann, E.; and Oyama, J.  
Changes in Functional Construction of Bone in Rats under Conditions of Simulated Increased Gravity. Zeitschrift Für Anatomie und Entwicklungsgeschichte, vol. 139, Apr. 16, 1973, p. 307-318.

1191. Beljan, J. R.; Winget, C. M.; and Rosenblatt, L. S.  
The Desynchronosis Syndrome. Aerospace Medical Association. Annual Scientific Meeting, Las Vegas, May 7-10, 1973. Preprints of Scientific Program. p. 223-224.
1192. Boyers, D. G.; Cuthbertson, J. G.; and Luetscher, J. A.  
Simulation of the Human Cardiovascular System: A Model with Normal Responses to Change of Posture, Blood Loss, Transfusion, and Autonomic Blockade. Simulation, vol. 18, June 1972, p. 197-206.
1193. Callahan, P. X.; Shepard, J. A.; and Ellis, S.  
Accelerated Chromatographic Method for Determination of Hydroxyproline. Analytical Biochemistry, vol. 49, Sept. 1972, p. 155-163.
1194. Callahan, P. X.; McDonald, J. K.; and Ellis, S.  
Dipeptidyl Aminopeptidase. I: Application in Sequencing of Peptides. Federation Proceedings, vol. 31, May-June 1972, p. 1105-1113.
1195. Dallman, M. F.; Jones, M. T.; Vernikos-Danellis, J.; and Ganong, W. F.  
Corticosteroid Feedback Control of ACTH Secretion: Rapid Effects of Bilateral Adrenalectomy on Plasma ACTH in the Rat. Endocrinology, vol. 91, Oct. 1972, p. 961-968.
1196. Daniels-Severs, A. E.; and Vernikos-Danellis, J.  
Effect of Aminoglutethimide and Glutethimide on the Pituitary-Adrenal System. Pharmacology, vol. 10, 1973, p. 111-122.
1197. Daniels-Severs, A.; Goodwin, A.; Keil, L. C.; and Vernikos-Danellis, J.  
Effect of Chronic Crowding and Cold on the Pituitary-Adrenal System: Responsiveness to an Acute Stimulus During Chronic Stress. Pharmacology, vol. 9, 1973, p. 348-356.
1198. Erickson, H. H.; Sandler, H.; Stone, H. L.; and Young, S.  
Cardiac Function during +G<sub>z</sub> Acceleration. Aerospace Medical Association. Annual Scientific Meeting, Las Vegas, May 7-10, 1973. Preprints of Scientific Program. p. 192-193.  
(Also published in Italian in Rivista di Medicina Aeronautica e Spaziale, vol. 36, 1973, p. 86.)
1199. Erickson, H. H.; Adams, J. D.; Stone, H. L.; and Sandler, H.  
Coronary Flow and Left Ventricular Function during Environmental Stress. In International Telemetry Conference, Los Angeles, Calif., Oct. 10-12, 1972, Proceedings. Woodland Hills, Calif., International Foundation for Telemetry, 1972. p. 206-213.
1200. Feller, D. D.; Neville, E. D.; Talarico, K. S.; Cole, A. O.; and DeGrazia, J. A.  
<sup>14</sup>C-Radiospirometry System for Astronaut Medical Monitoring. In Aerospace Medical Association, Annual Scientific Meeting, 43rd, Bal Harbour, Fla., May 8-11, 1972. Preprints of the Scientific Program, 1972. p. 62-63.

1201. Feller, D. D.; and Neville, E. D.  
Increased Partial Pressures of Oxygen at Normal Barometric Pressure on Lipogenesis in Rat Tissues. Society for Experimental Biology and Medicine. Proceedings, vol. 143, June 1973, p. 582-588.
1202. Furner, R. L.; Neville, E. D.; Talarico, K. S.; and Feller, D. D.  
A Common Modality of Action of Simulated Space Stresses on the Oxidative Metabolism of Ethylmorphine, Aniline and p-Nitroanisole by Male Rat Liver. Toxicology and Applied Pharmacology, vol. 21, Apr. 1972, p. 569-581.
1203. Furner, R. L.; and Feller, D. D.  
Improved Automated Method for the Study of Drug Metabolism. Biochemical Pharmacology, vol. 21, June 1972, p. 1549-1552.
1204. Greenleaf, J. E.  
Blood Electrolytes and Exercise in Relation to Temperature Regulation in Man. In the Pharmacology of Thermoregulation; Proceedings of the Symposium, San Francisco, Calif., July 23-28, 1972. Basel, S. Karger Ag, 1973. p. 72-84.
1205. Greenleaf, J. E.; Young, H. L.; Bernauer, E. M.; Armbruster, R. H.; Sagan, L. A.; Staley, R. W.; Juhos, L.; van Beaumont, W.; and Sandler H.  
Effects of Isometric and Isotonic Exercise on Body Water Compartments during 14 Days Bed Rest. Aerospace Medical Association. Annual Scientific Meeting, Las Vegas, May 7-10, 1973. Preprints of Scientific Program. p. 23-24.
1206. Greenleaf, J. E.; van Beaumont, W.; Bernauer, E. M.; Haines, R. F.; Sandler, H.; Staley, R. W.; Young, H. L.; and Yusken, J. W.  
Effects of Rehydration on +G<sub>z</sub> Tolerance After 14-Days' Bed Rest. Aerospace Medicine, vol. 44, July 1973, p. 715-722.
1207. Greenleaf, J. E.; Castle, B. L.; and Ruff, W. K.  
Maximal Oxygen Uptake, Sweating and Tolerance to Exercise in the Heat. International Journal of Biometeorology, vol. 16, 1972, p. 375-387.
1208. Greenleaf, J. E.; van Beaumont, W.; Bernauer, E. M.; Haines, R. F.; Sandler, H.; Young, H. L.; and Yusken, J. W.  
+G<sub>z</sub> Tolerance after 14 Days Bed Rest and the Effects of Rehydration. In Aerospace Medical Association, Annual Scientific Meeting, 43rd, Bal Harbour, Fla., May 8-11, 1972. Preprints of the Scientific Program. p. 112-113.
1209. Greenleaf, J. E.  
Temperature Regulation During Isotonic Exercise. Acta Physiologica Polonica, vol. 24, (Supplement 6) 1973, p. 67-75.



1210. Harrison, G. A.; and Klein, G.  
Changes in Heart Ultrastructure Following Exposure to High Levels of CO<sub>2</sub>. Electron Microscopy Society of America. 31st Annual Conference, New Orleans, La., 1973. Proceedings.
1211. Harrison, G.; and Lapp, N. L.  
Electron Microscopic Findings in the Lungs of Miners. New York Academy of Sciences. Annals, vol. 200, Dec. 29, 1972, p. 73-93.
1212. Hetherington, N. W.; Rosenblatt, L. S.; Higgins, E. A.; and Winget, C. M.  
Quantification of the Rates of Resynchronization of Heart Rate with Body Temperature Rhythms in Man following a Photoperiod Shift. In International Congress on Aviation and Space Medicine, 21st, Munich, West Germany, Sept. 17-21, 1973. Preprints of Lectures. Munich, Sekretariat, Internationaler Kongress für Luft- und Raumfahrtmedizin, 1973. p. 225-226.
1213. Leon, H. A.  
CO<sub>2</sub>-Aspirin Interaction during Chronic Exposure and Administration. Aerospace Medical Association. Annual Scientific Meeting, Las Vegas, May 7-10, 1973. Preprints of Scientific Program. p. 114-115.
1214. Luetscher, J. A.; Boyers, D. G.; Cuthbertson, J. G.; and McMahon, D. F.  
A Model of the Human Circulation - Regulation by Autonomic Nervous System and Renin-Angiotensin System, and Influence of Blood Volume on Cardiac Output and Blood Pressure. Circulation Research, vol. 32: Supplement I. May 1973, p. I-84 - I-98.
1215. McDonald, J. K.; Callahan, P. X.; and Ellis, S.  
Preparation and Specificity of Dipeptidyl Aminopeptidase I. Methods in Enzymology. Vol. 25, Enzyme Structure. Part B. New York, N.Y., Academic Press, 1972. p. 272-281.
1216. Pitts, G. C.; Bull, L. S.; and Oyama, J.  
Effect of Chronic Centrifugation on Body Composition in the Rat. American Journal of Physiology, vol. 223, Nov. 1972, p. 1044-1048.
1217. Rosenblatt, L. S.; Klein, K. E.; Winget, C. M.; Hetherington, N. W.; and Beljan, J. R.  
Resynchronization Rates of a Psychomotor Test Rhythm in Man Following Translongitudinal Flights. Aerospace Medical Association. Annual Scientific Meeting, Las Vegas, May 7-10, 1973. Preprints of Scientific Program. p. 225-226.
1218. Sandler, H.; Fryer, T. B.; Rositano, S. A.; and Lee, R. D.  
The Application of Aerospace Technology to Patient Monitoring. IEEE Transactions on Biomedical Engineering, vol. BME-20, May 1973, p. 189-194.

1219. Sandler, H.; Greenleaf, J. E.; Young, H. L.; Bernauer, E. M.; Morse, J. T.; Staley, R. W.; Haines, R. F.; and van Beaumont, W. Effects of Isometric and Isotonic Exercise during 14 days Bed Rest on  $+G_z$  Tolerance. Aerospace Medical Association. Annual Scientific Meeting, Las Vegas, May 7-10, 1973. Preprints of the Scientific Program. p. 21-22.
1220. Sandler, H.; Fryer, T. B.; and Stone, H. L. Implantable Telemetry Systems for Use in Animal Monitoring. Biomaterials, Medical Devices, and Artificial Organs, vol. 1, 1973, p. 405-417.
1221. Sandler, H.; Stone, H. L.; Fryer, T. B.; and Westbrook, R. M. Use of Implantable Telemetry Systems for Study of Cardiovascular Phenomena. Circulation Research, vol. 31, Sept. 1972, Supplement No. II, p. II-85 - II-100.
1222. Stone, H. L.; Erickson, H.; and Sandler, H. Splanchnic Blood Flow and  $\pm G_z$  Acceleration. In Aerospace Medical Association. Annual Scientific Meeting, 43rd, Bal Harbour, Fla., May 8-11, 1972. Preprints of the Scientific Program, p. 85-86.
1223. van Beaumont, W.; Strand, J. C.; Petrofsky, J. S.; Hipskind, S. G.; and Greenleaf, J. E. Changes in Total Plasma Content of Electrolytes and Proteins with Maximal Exercise. Journal of Applied Physiology, vol. 34, Jan. 1973, p. 102-106.
1224. van Beaumont, W.; and Greenleaf, J. E. Comparative Changes in Plasma Protein Concentration, Hematocrit and Plasma Volume During Exercise, Bedrest and  $+G_z$  Acceleration. In Aerospace Medical Association. Annual Scientific Meeting, 43rd, Bal Harbour, Fla., May 8-11, 1972. Preprints of the Scientific Program. p. 114-115.
1225. van Beaumont, W.; Greenleaf, J. E.; and Juhos, L. Disproportional Changes in Hematocrit, Plasma Volume, and Proteins During Exercise and Bed Rest. Journal of Applied Physiology, vol. 33, July 1972, p. 55-61.
1226. van Beaumont, W.; Young, H. L.; and Greenleaf, J. E. Influence of Isometric and Isotonic Exercise during Bedrest on Changes in Plasma Volume, Plasma Protein Concentration and Content during  $+G_z$  Acceleration. Aerospace Medical Association. Annual Scientific Meeting, Las Vegas, May 7-10, 1973. Preprints of the Scientific Program. p. 19-20.

1227. Vernikos-Danellis, J.; Berger, P.; and Barchas, J. D.  
Brain Serotonin and Pituitary-Adrenal Function. In Zimmerman, E.;  
Gispen, W. H.; Marks, B. H.; and de Wied, D., Editors. Drug Effects  
on Neuroendocrine Regulation. Amsterdam, Holland, Elsevier, 1973.  
p. 301-310. (Progress in Brain Research, vol. 39)
1228. Vernikos-Danellis, J.; and Berger, P. A.  
Brain Serotonin and the Pituitary-Adrenal System. In Barchas, J. D.;  
and Usdin, E., Editors. Serotonin and Behavior. New York, N.Y.,  
Academic Press, 1973. p. 173-177.
1229. Vernikos-Danellis, J.  
Effects of Hormones on the Central Nervous System. In Hormones and  
Behavior. Levine, S., Editor. New York, Academic Press, 1972. p.  
11-62.
1230. Vernikos-Danellis, J.; Leach, C. S.; Winget, C. M.; Goodwin, A. L.;  
and Rambaut, P. C.  
Fifty-Six Days of Bedrest: Glucose, Insulin and Growth Hormone.  
Aerospace Medical Association. Annual Scientific Meeting, Las Vegas,  
May 7-10, 1973. Preprints of Scientific Program. p. 94-95.
1231. Vernikos-Danellis, J.; Leach, C. S.; Winget, C. M.; Rambaut, P. C.;  
and Mack, P. B.  
Thyroid and Adrenal Cortical Rhythmicity During Bed Rest. Journal of  
Applied Physiology, vol. 33, Nov. 1972, p. 644-648.
1232. Vohra, P.; Johnson, C. M.; McFarland, L. Z.; Siopes, T. D.; Wilson,  
W. O.; and Winget, C. M.  
Role of Selenium in Neural Physiology of Avian Species. 2. The  
Distribution of  $^{75}\text{Se}$  from Injected Selenomethionine- $^{75}\text{Se}$  in the  
Tissues and its Fate in Livers of Chickens. Poultry Science, vol. 52,  
1973, p. 644-647.  
(Also published as NASA TM-X-69510)
1233. Winget, C. M.; Vernikos-Danellis, J.; Cronin, S. E.; Leach, C. S.;  
Rambaut, P. C.; and Mack, P. B.  
Circadian Rhythm Asynchrony in Man During Hypokineses. Journal of  
Applied Physiology, vol. 33, Nov. 1972, p. 640-643.
1234. Winget, C. M.; Vernikos-Danellis, J.; DeRoshia, C. W.; Cronin, S. E.;  
Leach, C. S.; and Rambaut, P. C.  
Fifty-Six Days of Bedrest: Circadian Rhythms of Heart Rate and Body  
Temperature. Aerospace Medical Association. Annual Scientific Meeting,  
Las Vegas, May 7-10, 1973. Preprints of Scientific Program. p. 25-26.
1235. Winget, C. M.; Hetherington, N. W.; Rosenblatt, L. S.; and Rambaut,  
P. C.  
Method for Analyses of Cyclic Physiological Data that are Nonstationary  
in Time. Journal of Applied Physiology, vol. 33, Nov. 1972, p. 635-  
639.

1236. Winget, C. M.; Vernikos-Danellis, J.; and Sakellaris, P. C.  
Noradrenergic Control of Circadian Rhythms in Cebus albifrons.  
American Journal of Physical Anthropology, vol. 38, Mar. 1973,  
p. 331-337.

PATENTS

1237. Howard, W. H.; Young, D. R.; and Adachi, R. R.  
Programmable Physiological Infusion. Dec. 1, 1972.  
US-PATENT-APPL-SN-311175

BIOTECHNOLOGY DIVISION

FORMAL REPORTS

1238. Allan, J. R.; Chambers, A.; Saxton, C.; and Taylor A.  
A Laboratory Assessment of a Simplified Air Ventilated Garment. Royal  
Air Force Institute of Aviation Medicine. Aircrew Equipment Group  
Report, no. 302. May 1973.
1239. Bailey, O. T.; Benton, E. V.; Cruty, M. T.; Harrison, G. A.;  
Haymaker, W.; Humason, G.; Leon, H. A.; Lindberg, R. L.; Look, B. C.;  
Lushbaugh, C. C.; Philpott, D. E.; Samorajski, T.; Simmonds, R. C.;  
Suri, K. P.; Tremor, J. W.; Turnbill, C. E.; Vogel, F. S.; Winter,  
D. L.; and Zeman, W.  
Biocore Experiment. In Apollo 17 Preliminary Science Report. 1973.  
p. 26-1 - 26-14.  
NASA SP-330 N74-18438
1240. Baty, D. L.  
Human Transinformation Rates during One-to-Four Axis Tracking with a  
Concurrent Audio Task. In Annual Conference on Manual Control, 7th,  
University of Southern California, Los Angeles, Calif., June 2-4, 1971.  
1972. p. 293-306.  
NASA SP-281 N73-10139
1241. Chambers, A. B.; and Blackaby, J. R.  
A Liquid Cooled Garment Temperature Controller Based on Sweat Rate.  
In Conference on Portable Life Support Systems, 2d, Moffett Field,  
Calif., May 11-13, 1972, Proceedings. p. 283-287.  
NASA SP-302 N72-27125
1242. Chambers A.  
A Review of Tests for the Evaluation of Speech Communication With  
Particular Reference to High Speed Low Level Strike Aircraft. Royal  
Aircraft Establishment, Tech Memo EP-543. May 1973.
1243. Chambers, A. B.; Blackaby, J. R. and Miles, J. B.  
A Study of the Thermoregulatory Characteristics of a Liquid-Cooled  
Garment with Automatic Temperature Control Based on Sweat Rate:  
Experimental Investigation and Biothermal Man-Model Development. June  
1973.  
NASA TN-D-7311 N73-25126
1244. Chase, W. D.  
Evaluation of Several TV Display Systems for Visual Simulation of the  
Landing Approach. Mar. 1971.  
NASA TN-D-6274 N71-22270
1245. Conference on Portable Life Support Systems, 2nd, Ames Research Center,  
Moffett Field, Calif., May 11-13, 1971. Proceedings. 1972.  
NASA SP-302 N72-27106

1246. Haines, R. F.; Fitzgerald, J. W.; and Rositano, S. A.  
Development of an Automated Visual Sensitivity Tester. 1971.  
NASA TN-D-6190 N71-18971
1247. Haines, R. F.  
Effects of Various Runway Lighting Parameters upon the Relation  
Between Runway Visual Range and Visual Range of Center Line and Edge  
Lights in Fog. Dec. 1973.  
FAA-RD-73-170
1248. Haines, R. F.; Bartz, A. E.; and Zahn, J. R.  
Human Performance Capabilities in a Simulated Space Station-Like  
Environment. 1. Fixed Beam Luminance and Location. Jan. 1972.  
NASA TM-X-62101 N72-18102
1249. Howard, J. C.  
Mathematical Modelling by Symbolic Mathematical Computation - a  
Cosmological Application. Mar. 1971.  
NASA TN-D-6233 N71-18477
1250. Kreifeldt, J. G.; and Wempe, T.  
Pilot Performance during a Simulated Standard Instrument Procedure  
Turn With and Without a Predictor Display. Jan. 1973.  
NASA TM-X-62201 N73-17118
1251. Lincoln, R.; Palmer, E. A.; and Wempe, T.  
Effect of Pictorial Display Configuration on the Frequency of Control  
Reversals during Aircraft Landing Approaches. Oct. 1972.  
NASA TM-X-62191 N72-33023
1252. Malich, C. W.; and Wydeven, T.  
Catalyzed Sodium Chlorate Candles. In Conference on Portable Life  
Support Systems, 2d, Ames Research Center, Moffett Field, Calif.,  
May 11-13, 1971. Proceedings. 1972. p. 335-345.  
NASA SP-302 N72-27131
1253. Otto, D. A.; and Leifer, L. J.  
The Effect of Modifying Response and Performance Feedback Parameters  
on the CNV in Humans. Jan. 1972.  
NASA TM-X-62097 N72-15099
1254. Palmer, E. A.; and Cronn, F. W.  
Head-Up Displays for STOL Visual Approaches. In NASA. Ames Research  
Center, Moffett Field, Calif. STOL Technology; Conference Held at  
Moffett Field, Calif., Oct. 17-19, 1972. p. 227-243.  
NASA SP-320 N73-32952
1255. Palmer, E. A.  
Night Visual Approaches - Pilot Performance With and Without a Head-Up  
Display. Oct. 1972.  
NASA TM-X-62188 N72-33024

1256. Palmer, E.; and Wempe, T.  
Pilot Performance with a Simulated ILS Independent Pictorial Display.  
In Annual Conference on Manual Control, 7th, University of Southern California, Los Angeles, Calif., June 2-4, 1971. 1972. p. 139-154.  
NASA SP-281 N73-10122
1257. Patton, R. M.; and Coler, C. R.  
Effects of Long Duration Confinement on Short-Term Memory. In Preliminary Results from an Operational 90-Day Manned Test of a Regenerative Life Support System, Langley Research Center, Langley Station, Va., Nov. 17-18, 1970. Compiled by Pearson, A. O.; and Grana, D. C.. 1971. p. 437-445.  
NASA SP-261 N71-20985
1258. Shitzer, A.  
Mathematical Models of Thermoregulation and Heat Transfer in Mammals. A Compendium of Research. July 1972.  
NASA TM-X-62172 N72-28043
1259. Taketa, S. T.  
Appendix A. Space Shuttle Sortie Workshop, Working Group Reports, NASA Goddard Space Flight Center, Maryland, July 31-Aug. 4, 1972. Proceedings, vol. 2, p. 8-A-1 - 8-A-3.  
NASA TM-X-68842 N73-15867
1260. Williams, B. A.; and Chambers, A. B.  
Effect of Neck Warming and Cooling on Thermal Comfort. In Conference on Portable Life Support Systems, 2d, Ames Research Center, Moffett Field, Calif., May 11-13, 1972. Proceedings. p. 289-294.  
NASA SP-302 N72-27126
1261. Young, R. S.; Tremor, J. W.; Willoughby, R.; Corbett, R. L.; Souza, K. A.; and Sebesta, P. D.  
The Effect of Weightlessness on the Dividing Eggs of Rana pipiens. In The Experiments of Biosatellite II. 1971. p. 251-271.  
NASA SP-204 N72-20060

#### NASA CONTRACTOR REPORTS

1262. Allen, R. W.; and Jex, H. R.  
Visual-Motor Response of Crewmen during a Simulated 90-Day Space Mission as Measured by the Critical Task Battery. May 1973.  
NASA CR-2240 N73-24134
1263. Anon.  
High Pressure Space Suit Glove. (SAC-100218, Space Age Control, Inc., Palmdale, Calif.; NAS2-7009.) Jan. 2, 1972.  
NASA CR-114532 N73-15162
1264. Anon.  
Project Cyclops: A Design Study of a System for Detecting Extraterrestrial Intelligent Life. (Stanford Univ., Calif.; NGT-05-020151.) 1972.  
NASA CR-114445 N73-18822

1265. Baron, S.; and Levison, W. H.  
A Manual Control Theory Analysis of Vertical Situation Displays for  
STOL Aircraft. (BBN-2484, Bolt, Beranek, and Newman, Inc., Cambridge,  
Mass.; NAS2-6652.) Apr. 1973.  
NASA CR-114620 N73-24061
1266. Bassham, J. A.; Bearden, L.; Wilke, C.; Carroad, P.; Mitra, G.; and  
Ige, R.  
The Synthesis of Starch from Carbon Dioxide Using Insolubilized  
Stabilized Enzymes. (California Univ., Berkeley, Lawrence Berkeley  
Lab.; NASA ORDER A-68042-A.) June 9, 1972.  
NASA CR-114460 N72-26103
1267. Benedict, J. V.  
The Investigation of Vertebral Injury Sustained during Aircrew  
Ejection. Final Technical Report, 28 June 1970 - 15 Jan. 1972.  
(Technology, Inc San Antonio, Tex.; NAS2-5062.) Jan 15, 1972.  
NASA CR-114452 N72-22077
1268. Clark, D. L.  
Effects of Weightlessness on the Development of the Vestibular Apparatus  
and Ocular Nystagmus in the Rat. Annual Report, 1 Oct. 1971-30 Sept.  
1972. (REPT-4, Ohio State Univ. Research Foundation, Columbus; NAS2-  
6634.) Dec. 18, 1972.  
NASA CR-114569 N73-17112
1269. Clifford, J. E.; and Sexton, R. W.  
Evaluation of Electrochemical Nitrogen/Hydrogen Gas Separator, Final  
Report. (Battelle Columbus Labs., Ohio; NAS2-7056.) Jan. 1973.  
NASA CR-137484 N75-13932
1270. Colombo, G. V.  
Study of CO<sub>2</sub> Sorbents for Extravehicular Activity. (MDC-G4778,  
McDonnell-Douglas Astronautics Co., Huntington Beach, Calif. NAS2-  
6959.) July 1973.  
NASA CR-114632 N73-29054
1271. Cornsweet, T. N.; and Crane, H. D.  
Experimental Study of Visual Accommodation. Mar. 1972.  
NASA CR-2007 N72-19170
1272. Elkins, W.  
High Pressure Space Suit Glove. Final Report. (Acurex Corp., Mountain  
View, Calif.; NAS2-7008.) Jan. 1973.  
NASA CR-114535 N73-17120
1273. Eyman, E. D.  
Bounded State Space. (Iowa Univ., Iowa City; NGR-16-001-090.) Mar.  
1, 1972.  
NASA CR-114527 N72-20237



1274. Gartner, W. B.; and Baldwin, K. M.  
 Simulator Evaluation of Display Concepts for Pilot Monitoring and  
 Control of Space Shuttle Approach and Landing. Phase II: Manual  
 Flight Control. Final Report. Dec. 1973.  
 NASA CR-2359 N74-13817
1275. Hamilton, R. W., Jr.; Uberto, B. P.; and Doebbler, G. F.  
 Relative Decompression Risks of Spacecraft Cabin Atmospheres -  
 Comparison of Gases Using Miniature Pigs. Final Report. (Ocean  
 Systems, Inc., Tarrytown, N.Y.; NAS2-5481.) July 30, 1971.  
 NASA CR-114355 N71-30847
1276. Hill, J. W.; and Sword, A. J.  
 Studies to Design and Develop Improved Remote Manipulator Systems.  
 Apr. 1973.  
 NASA CR-2238 N73-22055
1277. Johnson, W. A.; and Dimarco, R. J.  
 Application of an Approach and Landing System Model to the Space Shuttle  
 Orbiter Vehicle. (Systems Technology, Inc., Hawthorne, Calif.; NAS2-  
 6275.) Feb. 1972.  
 NASA CR-114465 N72-25875
1278. Johnson, W. A.; and Hoh, R. H.  
 Determination of ILS Category 2 Decision Height Window Requirements.  
 May 1972.  
 NASA CR-2024 N72-22651
1279. Johnson, W. A.; and McRuer, D. T.  
 Development of a Category 2 Approach System Model. May 1972.  
 NASA CR-2022 N72-22099
1280. Kleinman, D. L.; and Baron, S.  
 Analytic Evaluation of Display Requirements for Approach to Landing.  
 Nov. 1971.  
 NASA CR-1952 N72-12049
1281. Labak, L. J.; Remus, G. A.; and Mansnerus, R.  
 Design and Fabrication of a Prototype for an Automatic Transport System  
 for Transferring Human and Other Wastes to an Incinerator Unit Onboard  
 Spacecraft, Phase A. (General American Transportation Corp., Niles,  
 Ill.; NAS2-6386.) Dec. 1971.  
 NASA CR-114393 N72-14113
1282. LaPorte, T. R.  
 The Social Impacts of Technology: Toward an Assessment of STOL Aircraft  
 Potential. Semiannual Report, 1 Dec. 1972 - 30 May 1973. (NASA, Ames  
 Research Center, Moffett Field, Calif.; NGR-05-003-471.) May 30, 1973.  
 NASA CR-133356 N73-28942

1283. Levison, W. H.; and Tanner, R. B.  
A Control-Theory Model for Human Decision-Making. Dec. 1971.  
NASA CR-1953 N72-17079
1284. Marshall, R. D.; Schubert, F. H.; and Carlson, J. N.  
Electrochemical Carbon Dioxide Concentrator: Math Model. Final Report.  
(LSI-ER-134G-6, Life Systems, Inc., Cleveland, Ohio; NAS2-6478.) Aug.  
1973.  
NASA CR-114639 N74-10101
1285. Marshall, R. D.; Wynveen, R. A.; and Carlson, J. N.  
Evaluation of an Electrochemical N<sub>2</sub>/H<sub>2</sub> Gas Separator. Final Report.  
(LSI-ER-168-8, Life Systems, Inc., Cleveland Ohio; NAS2-7057.) Mar.  
1973.  
NASA CR-114580 N73-22431
1286. McRuer, D. T.; and Johnson, W. A.  
Development of Approach Control System Requirements with Applications  
to a Jet Transport. May 1972.  
NASA CR-2023 N72-22652
1287. Onischak, M.; and Baker, B. S.  
Carbon Dioxide Adsorbent Study. Final Report. (Energy Research Corp.,  
Bethel, Conn.; NAS2-7023.) Sept. 1973.  
NASA CR-114661 N73-31013
1288. Ringland, R. F.; and Stapleford, R. L.  
Experimental Measurements of Motion Cue Effects on STOL Approach Tasks.  
(TR-1014-2, Systems Technology, Inc., Hawthorne, Calif.; NAS2-6433.)  
Apr. 1972.  
NASA CR-114458 N72-27032
1289. Ringland, R. F.; Stapleford, R. L.; and Magdaleno, R. E.  
Motion Effects on an IFR Hovering Task - Analytical Predictions and  
Experimental Results. Nov. 1971.  
NASA CR-1933 N72-14999
1290. Roebelen, G. J., Jr.  
Ice Pack Heat Sink Subsystem - Phase 1, Vol. 1. (SVHSER-6223-VOL-1,  
Hamilton Standard Div., United Aircraft Corp., Windsor Locks, Conn.;  
NAS2-7011.) June 1973.  
NASA CR-114624-VOL-1 N73-31006
1291. Roebelen, G. J., Jr.  
Ice Pack Heat Sink Subsystem - Phase 1, Vol. 2. (SVHSER-6223-VOL-2,  
Hamilton Standard Div., United Aircraft Corp., Windsor Locks, Conn;  
NAS2-7011.) June 1973.  
NASA CR-114624-VOL-2 N73-31829

1292. Selman, J. R.; Steunenberg, R. K.; and Cairns, E. J.  
 Research on Oxygen Recovery Systems for Use in Space Capsules.  
 Progress Report, Feb. 1972-Jan. 1973. (ANL-8018, Argonne National  
 Lab., Ill.; NASA ORDER A-70738-A.) Feb. 1973.  
 NASA CR-114573 N73-25130
1293. Solomon H. L.  
 Study of Short-Haul High-Density V/STOL Transportation Systems, Vol. 1.  
 Interim Report. (ATR-72(7301)-1-VOL-1, Aerospace Corp., El Segundo,  
 Calif.; NAS2-6473.) July 1972.  
 NASA CR-114466 N73-10990
1294. Solomon, H. L.  
 Study of Short-Haul High-Density V/STOL Transportation Systems. Vol. 2.  
 Appendices. Interim Report. (ATR-72(7301)-1-VOL-2-APP, Aerospace  
 Corp., El Segundo, Calif.; NAS2-6473.) July 1972.  
 NASA CR-114467 N73-10991
1295. Spyker, D. A.; Stackhouse, S. P.; Khalafalla, A. S.; and McLane, R. C.  
 Development of Techniques for Measuring Pilot Workload. Nov. 1971.  
 NASA CR-1888 N72-12060
1296. Sutton, J. G.; Heimlich, P. F.; and Tepper, E. H.  
 Advanced Extravehicular Protective Systems Study, Vol. 1. (Hamilton  
 Standard Div., United Aircraft Corp., Windsor Locks, Conn.; NAS2-6021.)  
 Mar. 1972.  
 NASA CR-114383 N72-22900
1297. Sutton, J. G.; Heimlich, P. F.; and Tepper, E. H.  
 Advanced Extravehicular Protective Systems Study, Vol. 2. (Hamilton  
 Standard Div., United Aircraft Corp., Windsor Locks, Conn.; NAS2-6021.)  
 Mar. 1972.  
 NASA CR-114384 N72-22901
1298. Weir, D. H.; and McRuer, D. T.  
 Pilot Dynamics for Instrument Approach Tasks: Full Panel Multiloop and  
 Flight Director Operations. May 1972.  
 NASA CR-2019 N72-24087
1299. Williams, J. L.; Webbon, B. W.; and Copeland, R. J.  
 Advanced Extravehicular Protective System (AEPS) Study. (T141RP007,  
 Vought Missiles and Space Co., Dallas, Tex.; NAS2-6022.) Mar. 1972.  
 NASA CR-114382 N72-25133
1300. Wynveen, R. A.; Schubert, F. H.; and Powell, J. D.  
 One-Man, Self-Contained CO<sub>2</sub> Concentrating System. (LSI-ER-131-16,  
 Life Systems, Inc., Cleveland, Ohio; NAS2-6118.) Mar. 1972.  
 NASA CR-114426 N72-25134

JOURNAL ARTICLES, MEETING PAPERS, BOOKS AND CHAPTERS OF BOOKS

1301. Anliker, J.; Finger, H.; and Rimmer, T.  
Entrainability of Cortical Alpha Phase as an Estimator of Alertness. Aerospace Medical Association. Annual Scientific Meeting, Las Vegas, May 7-10, 1973. Preprints of the Scientific Program. p. 131-132.
1302. Anliker, J.; Lai, D.; Rimmer, T; and Finger, H.  
Estimating Signal and Noise in Coherent Time Averages of EEG Data. Conference on Engineering in Medicine and Biology, 26th Annual, Minneapolis, Sept. 30-Oct. 4, 1973. Proceedings, p. 398.
1303. Anliker, M.; and Billingham, J.  
Biomechanical Studies in Aerospace Physiology. IEEE Spectrum, vol. 8, Mar. 1971, p. 64-72.
1304. Ballou, E. V.; Wydeven, T.; and Leban, M. I.  
Solute Rejection by Porous Glass Membranes. I. Hyperfiltration of Sodium Chloride and Urea Feed Solutions. Environmental Science and Technology, vol. 5, Oct. 1971, p. 1032-1038.
1305. Ballou, E. V.; and Wydeven, T.  
Solute Rejection by Porous Glass Membranes. II. Pore Size Distributions and Membrane Permeabilities. Journal of Colloid and Interface Science, vol. 41, Nov. 1972, p. 198-207.
1306. Ballou, E. V.; Leban, M. I.; and Wydeven, T.  
Solute Rejection by Porous Glass Membranes. III. Reduced Silica Dissolution and Prolonged Hyperfiltration Service with Feed Additives. Journal of Applied Chemistry and Biotechnology, vol. 23, Feb. 1973, p. 119-130.
1307. Barnebey, A.; Nagel, D. C.; and Carterette, E. C.  
An Earphone Coupling System for Acute Physiological Studies. Acoustical Society of America, Journal, vol. 52, Oct. 1972, p. 1256-1262.
1308. Baty, D. L.; Wempe, T.; and Huff, E.  
A Study on Aircraft Map Display Location and Orientation. In Annual Conference on Manual Control, 9th, Cambridge, Mass., May 23-25, 1973. Proceedings. 1973. p. 9-24.  
(Also published as NASA TM-X-62198)
1309. Billingham, J.  
A Proposed Experimental Program for Determining the Requirements for Artificial Gravity. New York, American Inst. of Aeronautics and Astronautics and Aerospace Medical Association. Weightlessness and Artificial Gravity Meeting, Williamsburg, Va., Aug. 9-11, 1971. AIAA Paper 71-871.

1310. Billings, C. E.; Ralston, R. H.; and Hare, D. E.  
Untoward Effects of a Sympathomimetic Amine. *Aerospace Medicine*,  
vol. 45, May 1974, p. 551-552.
1311. Celino, V. A.; and Wydeven, T.  
Development Status of the Water Vapor Electrolysis System. American  
Society of Mechanical Engineers, Society of Automotive Engineers, and  
American Inst. of Aeronautics and Astronautics. Life Support and  
Environmental Control Conference, San Francisco, Calif., July 12-14,  
1971. ASME Paper 71-AV-24.
1312. Chambers, A.; and Blackaby, J.  
A Liquid Cooled Garment Temperature Controller Based on Sweat Rate.  
Aerospace Medical Association. 1971 Annual Scientific Meeting,  
Houston, Apr. 26-29. 1971. Preprints of the Scientific Program.  
p. 38-39.
1313. Chambers, A. B.  
Advanced Regenerative Portable Life Support System for Extravehicular  
Activity. American Society of Mechanical Engineers, Society of Auto-  
motive Engineers, and American Inst. of Aeronautics and Astronautics.  
Life Support and Environmental Control Conference, San Francisco, Calif.,  
July 12-14, 1971. ASME Paper 71-AV-10.
1314. Chase, W. D.  
Performance with Computer Generated and TV Model Visual Displays for  
Visual Simulation of the Landing Approach. Society for Information  
Display. 1972 Digest of Technical Papers, June 1972, p. 1-2.
1315. Chermside, H. B.; Shapira, J.; and Furst, A.  
Growth of Edible Yeast on Formose: A Synthetic Carbohydrate. Western  
Pharmacology Society. Proceedings, vol. 16, 1973, p. 266-268.
1316. Chermside, H. B.; Okoye, N. N.; and Shapira, J.  
Growth of Rhodotorula pilimanae on the Synthetic Carbohydrate Formose.  
The Western Pharmacology Society. Proceedings, vol. 15, p. 61-64.
1317. Chermside, H. B.; Gill, A.; Gurst, A.; and Shapira, J.  
Growth of Yeasts on Synthetic Carbohydrates. Western Pharmacology  
Society. Proceedings, vol. 14, 1971, p. 112-114.
1318. Chermside, H. B.; Graudenz, J. Y.; Furst, A.; and Shapira, J.  
An Index for Describing Food Utility. Western Pharmacology Society.  
Proceedings. Vol. 14, 1971. p. 121-124.
1319. Clark, B.; and Stewart, J. D.  
Comparison of the Sensitivity to Rotation of Pilots and Nonpilots.  
*Aerospace Medicine*, vol. 43, Jan. 1972, p. 8-12.

1320. Clark, B.; and Stewart, J. D.  
Effect of Angular Acceleration on Man: Choice Reaction Time Using Visual and Rotary Motion Information. Aerospace Medical Association. Annual Scientific Meeting, Las Vegas, May 7-10, 1973. Preprints of Scientific Program. p. 279-280.
1321. Clark, B.; and Stewart, J. D.  
The Power Law for the Perception of Rotation by Airline Pilots. Perception and Psychophysics, vol. 11, June 1972, p. 433-436.
1322. Clark, B.; and Stewart, J. D.  
Relationship Between Motion Sickness Experience and Tests of the Perception of Rotation in Pilots and Nonpilots. Aerospace Medicine, vol. 44, Apr. 1973, p. 393-396.
1323. Clark, B.; and Stewart, J. D.  
The Relationship Between Motion Sickness Experience and Vestibular Tests in Pilots and Nonpilots. In Aerospace Medical Association. Annual Scientific Meeting, 43rd, Bal Harbour, Fla., May 8-11, 1972. Preprints of The Scientific Program. p. 16-17.
1324. Coler, C. R.; Patton, R. M.; and Lampkin, E. C.  
Effects of Prolonged Confinement in a Hyperbaric Environment on Short-Term Memory. Aerospace Medical Association. 1971 Annual Scientific Meeting, Houston, Apr. 26-29, 1971. Preprints of the Scientific Program. p. 152-153.
1325. Corbett, R.; Philpott, D. E.; and Black, S.  
Prolonged Fixation Studies for Spaceflight. Electron Microscopy Society of America. 31st Annual Conference, New Orleans, La., 1973. Proceedings.
1326. Daunton, N. G.  
Differentiation of Bite Force Response in the Rat. Journal of Comparative and Physiological Psychology, vol. 85, Nov. 1973, p. 367-372.
1327. Daunton, N.; and Jones, G. M.  
Directional Representation of Horizontal and Vertical Acceleration in the Neural Activity of Cat Vestibular Nuclei. Aerospace Medical Association. Annual Scientific Meeting, Las Vegas, May 7-10, 1973. Preprints of the Scientific Program. p. 144.
1328. Dolkas, C. B.; Leon, H. A.; and Chackerian, M.  
Short Term Response of Insulin, Glucose, Growth Hormone and Corticosterone to Acute Vibration in Rats. Aerospace Medicine, vol. 42, July 1971, p. 723-726.
1329. Donchin, E.; Gerbrandt, L. A.; Leifer, L.; and Tucker, L.  
Is the Contingent Negative Variation Contingent on a Motor Response? Psychophysiology, vol. 9, Mar. 1972, p. 178-188.

1330. Donchin, E.; Otto, D.; Gerbrandt, L. K.; and Pribram, K. H.  
While a Monkey Waits: Electro cortical Events Recorded During the  
Foreperiod of a Reaction Time Study. *Electroencephalography and  
Clinical Neurophysiology*, vol. 31, Aug. 1971, p. 115-127.
1331. Ekblom, B.; Greenleaf, C. J.; Greenleaf, J. E.; and Hermansen, L.  
Temperature Regulation During Continuous and Intermittent Exercise  
in Man. *Acta Physiologica Scandinavica*, vol. 81, Jan. 1971, p. 1-10.
1332. Elkins, W.; and Williams, B. A.  
Advanced High Efficient Liquid Transport Garments. American Institute  
of Aeronautics and Astronautics Crew Equipment Systems Conference,  
Las Vegas, Nov. 7-9, 1973. AIAA Paper 73-1334.
1333. Elkins, W.; and Vykukal, H. C.  
An Advanced Highly Mobile 8 Psig Pressure Glove. American Institute  
of Aeronautics and Astronautics. Crew Equipment Systems Conference,  
Las Vegas, Nov. 7-9, 1973. AIAA Paper 73-1336.
1334. Falb, R. D.; Lynn, J.; and Shapira, J.  
Enzyme Polymer Adducts of Aldolase, Glyceraldehyde phosphate Dehydro-  
genase, and Fructosediphosphatase. *Experientia*, vol. 29, Aug. 1973,  
p. 958-959.
1335. Finger, H. J.; Anliker, J. E.; and Rimmer, T.  
A Real-Time Phase Vector Display for EEG Monitoring. Conference on  
Engineering in Medicine and Biology, 26th Annual, Minneapolis, Sept.  
30-Oct. 4, 1973. Proceedings. p. 297.
1336. Floyd, R. V.; Lai, D. C.; and Anliker, J. E.  
A Model for the Photically Stimulated Electroencephalographic Signals.  
San Diego Biomedical Symposium, San Diego, Jan. 31-Feb. 2, 1973.  
Proceedings. Vol. 12, 1973. p. 5-16.
1337. Ghista, D. N.; Rasmussen, D. N.; Linebarger, R. N.; and Sandler, H.  
Measurements, Modeling, Control and Simulation - as Applied to the  
Human Left Ventricle for Purposeful Physiological Monitoring.  
Franklin Institute. *Journal*, vol. 292, Dec. 1971, p. 545-554.
1338. Greenleaf, J. E.; Van Kessel, A. L.; Ruff, W.; Card, D. H.; and  
Rapport, M.  
Exercise Temperature Regulation in Man in the Upright and Supine  
Positions. *Medicine and Science in Sports*, vol. 3, 1971, p. 175-182.
1339. Greenleaf, J. E.; and Castle, B. L.  
External Auditory Canal Temperature as an Estimate of Core Temperature.  
*Journal of Applied Physiology*, vol. 32, Feb. 1972, p. 194-198.

1340. Greenleaf, J. E.; and Castle, B. L.  
External Auditory Canal Temperature as an Estimate of Mean Body Temperature. Aerospace Medical Association. 1971 Annual Scientific Meeting, Houston, Apr. 26-29, 1971. Preprints of the Scientific Program. p. 160-161.
1341. Haines, R. F.  
Color Design for Habitability. In American Institute of Architects. California Council. 28th Annual Conference, Monterey, Calif., Nov. 24, 1973. Proceedings. p. 84-106.
1342. Haines, R. F.  
Effect of Bedrest and Positive Radial Acceleration upon Peripheral Visual Response Time. In Aerospace Medical Association. Annual Scientific Meeting, 43rd, Bal Harbour, May 8-11, 1972. Preprints of the Scientific Program. p. 116-117.
1343. Haines, R. F.  
Effect of Passive 70° Head-Up Tilt on Peripheral Visual Response Time. Journal of Applied Physiology, vol. 34, Mar. 1973, p. 329-333.
1344. Haines, R. F.  
Effect of Prolonged Bedrest and +G<sub>z</sub> Acceleration Upon Peripheral Visual Response Time. Aerospace Medicine, vol. 44, Apr. 1973, p. 425-432. (Also published as NASA TN-D-7161)
1345. Haines, R. F.  
Effect of Prolonged Bedrest with Exercise on Body Balance. In Aerospace Medical Association. Annual Scientific Meeting, Las Vegas, May 7-10, 1973. Preprints of Scientific Program. p. 17-18.
1346. Haines, R. F.  
NASA/AIA Space Station Design Competition. Man-Environment Systems, vol. 2, July 1972, p. 237-244.
1347. Haines, R. F.; and Gilliland, K.  
Response Time in the Full Visual Field. Journal of Applied Psychology, vol. 58, Dec. 1973, p. 289-295.
1348. Haines, R. F.; and Bond, M. A.  
Science Fiction Becomes Fact. American Institute of Architects. Journal, vol. 58, July 1972, p. 28-29.
1349. Haines, R. F.; and Mayhew, L. B., Jr.  
Star Magnitude and Manual Navigation Sighting Accuracy Using the Apollo T2 Sextant. Human Factors, vol. 13, Oct. 1971, p. 435-444.
1350. Hanegan, J. L.; and Williams, B. A.  
Brain Calcium: Role in Temperature Regulation. Science, vol. 181, Aug. 17, 1973, p. 663-664.



1351. Hanegan, J. L.  
Control of Heart Rate in Cecropia Moths; Response to Thermal Stimulation. *Journal of Experimental Biology*, vol. 59, Aug. 1973, p. 67-76.
1352. Harrison, G. A.  
The Differences in Lung Ultrastructural Response of Small and Large Rats to Hyperoxia. *Electron Microscopy Association, 29th Annual Conference, Boston, Aug. 9-15, 1971. Proceedings.* p. 562.
1353. Harrison, G. A.  
Ultrastructural Changes in Rat Lung During Long-Term Exposure to Oxygen. *Experimental Medicine and Surgery*, vol. 29, 1971, p. 96-107.
1354. Hayashi, D. T.; Walsh, G. B.; Anliker, M.; Portwood, H.; and Leon, H. A.  
Ocular Vibration in Relation to Retinal Settling. *Annals of Ophthalmology*, vol. 3, Sept. 1971, p. 994-1000.
1355. Haymaker, W.; Sturrock, D.; Kirk, J. H.; Casey, H. W.; and Call, N. A.  
Neuropathological Evaluation of Monkeys Exposed to Body-Alone X-Radiation. *Space Life Sciences*, vol. 3, June 1972, p. 210-225.
1356. Heath, J. E.; Williams, B. A.; and Mills, S. H.  
Interactions of Hypothalamic Thermosensitivity and Body Size in Vertebrates. *International Journal of Biometeorology*, vol. 15, Dec. 1971, p. 254-257.
1357. Heath, J. E.; Williams, B. A.; Mills, S. H.; and Kluger, M. J.  
The Responsiveness of the Preoptic-Anterior Hypothalamus to Temperature in Vertebrates. *In Hibernation and Hypothermia, Perspectives and Challenges, Snowmass-at-Aspen, Colo., Jan. 3-8, 1971. Symposium.* South, F. E.; Hannon, J. P.; Willis, J. R.; Pengelley, E. T.; and Alpert, N. R., Editors. N.Y., Elsevier Publ. Co., 1972. p. 605-627.
1358. Hoffman, R. A.; Mack, P. B.; and Hood, W. N.  
Comparison of Calcium and Phosphorus Excretion with Bone Density Changes During Restraint in Immature *Macaca nemestrina* Primates. *Aerospace Medicine*, vol. 43, Apr. 1972, p. 376-383.
1359. Hollahan, J. R.; Wydeven, T.; and McCullough, R. P.  
A Centrifugal Method for the Evaluation of Polymer Membranes for Reverse Osmosis. *Journal of Applied Chemistry and Biotechnology*, vol. 23, Sept. 1973, p. 669-674.
1360. Hollahan, J. R.; and Wydeven, T.  
Plasma Chemical Synthesis of Higher Oxides of Cesium and Rubidium. *Journal of Inorganic and Nuclear Chemistry*, vol. 35, 1973, p. 1079-1086.

1361. Hollahan, J. B.; and Wydeven, T.  
Synthesis of Reverse Osmosis Membranes by Plasma Polymerization of Allylamine. *Science*, vol. 179, Feb. 2, 1973, p. 500-501.
1362. Hossain, S.; Goldsmith, R. L.; Tan, M.; Wydeven, T.; and Leban, M. I.  
Evaluation of 165 Deg F Reverse Osmosis Modules for Washwater Purification. *Journal of Engineering for Industry*, vol. 95, Nov. 1973, p. 1023-1029.  
(Also published as ASME Paper 73-ENAS-2)
1363. Howard, J. C.  
The Application of Symbolic Mathematical Computation to the Formulation of Models of Diverse Phenomena. SHARE, 38th Meeting, San Francisco, March 6-10, 1972. *Proceedings*, p. 34.
1364. Howard, J. C.  
Automatic Problem Formulation using the Metric Properties of Space. Franklin Institute. *Journal*, vol. 292, Dec. 1971, p. 535-543.
1365. Howard, J. C.  
A Transportation System Model That Relates Public Acceptance to Known Aspects of the System Parameters. AIAA/AICHe/AMS/ISA/SCi/SHARE. Summer Computer Simulation Conference, San Diego, June 14-16, 1972. p. 1433-1436.
1366. Hubbard, R. W.; Hoffman, R. A.; Jenkins, D.  
Tissue Enzyme Studies in Macaca nemestrina Monkeys. *Folia Primatologica*, vol. 16, 1971, p. 282-293.
1367. Kubokawa, C. C.  
Living Under Water - An Analog to Space Operations. (Project Tektite 2). Aerospace Medical Association. 1971 Annual Scientific Meeting, Houston, Apr. 26-29, 1971. *Preprints of the Scientific Program*. p. 185-186.
1368. Labak, L. J.; Remus, G. A.; and Shapira, J.  
Dry Incineration of Wastes for Aerospace Waste Management Systems. American Society of Mechanical Engineers. Environmental Control and Life Support Systems Conference, San Francisco, Aug. 14-16, 1972. ASME Paper 72-ENAV-2.
1369. Lampkin, E. C.  
Effects of  $\eta$ -Dominance and Group Composition on Task Efficiency in Laboratory Triads. *Organizational Behavior and Human Performance*, vol. 7, Apr. 1972, p. 189-202.

1370. Leifer, L. J.; and Cohen, L.  
EMG Analysis with a Small Computer On-Line. Conference on Engineering in Medicine and Biology, 24th Annual, Las Vegas, Oct. 31-Nov. 4, 1971. Washington, D. C., Alliance for Engineering in Medicine and Biology, 1971. Vol. 13, p. 139.
1371. Lewis, R. P.; and Sandler, H.  
Relationship between Changes in Left Ventricular Dimensions and the Ejection Fraction in Man. *Circulation*, vol. 44, Oct. 1971, p. 548-557.
1372. Miquel, J.; Bensch, K. G.; Philpott, D. E.; and Atlan, H.  
Natural Aging and Radiation-Induced Life Shortening in Drosophila melanogaster. *Mechanisms of Aging and Development*, vol. 1, Apr.-May 1972, p. 71-97.
1373. Miquel, J.; Lundgren, P. R.; and Binnard, R.  
Negative Geotaxis and Mating Behavior in Control and Gamma-Irradiated *Drosophila*. *Drosophila Information Service*, vol. 48, Mar. 1972, p. 60-61.
1374. Murphy, M. R.; Randle, R. J.; and Williams, B. A.  
Circadian Rhythms of Visual Accommodation Responses and Physiological Correlations. In Aerospace Medical Association. Annual Scientific Meeting, 43rd, Bal Harbour, May 8-11, 1972. Preprints of the Scientific Program. p. 154-155.
1375. Palmer, E. A.; and Cronn, F. W.  
Touchdown Performance with a Computer Graphics Night Visual Attachment. American Institute of Aeronautics and Astronautics. Visual and Motion Simulation Conference, Palo Alto, Calif., Sept. 10-12, 1973. AIAA Paper 73-927.
1376. Pecoraro, J. N.; Hays, E. L.; Hopson, G.; Osborne, R.; Carpenter, L. R.; Sadoff, M.; and Ingelfinger, L.  
Shuttle: Life Support, Protective Systems, and Crew System Interface Technology. *Astronautics and Aeronautics*, vol. 9, Feb. 1971, p. 58-63.
1377. Pedersen, D. M.; and Shears, L. M.  
A Review of Personal Space Research in the Framework of General System Theory. *Psychological Bulletin*, vol. 80, Nov. 1973, p. 367-388.
1378. Philpott, D. E.; Takahashi, A.; and Turnbull, C.  
The Disappearance of the Acid Mucopolysaccharide Coating in Blood Vessels Exposed to Oxygen, Radiation and in Old Age and Possible Implications. Electron Microscopy Society of America. 31st Annual Conference, New Orleans, 1973. Proceedings. p. 398.

1379. Philpott, D. E.  
Sputum Fundamentals and Clinical Pathology. In Ultrastructure of Respiratory Mucosa. Dulfano, M. V., Editor. Springfield, Ill., Thomas, 1973. p. 182-202.
1380. Philpott, D. E.; Corbett, R.; Black, S.; and Turnbull, C.  
Ultrastructural Investigation of the "Light Flash" Phenomenon Seen by Our Astronauts. Electron Microscopy Society of America. 30th Annual Conference, Los Angeles, Aug. 14-17, 1972. Proceedings. p. 52.
1381. Quattrone, P. D.  
Spacecraft Oxygen Recovery System. *Astronautica Acta*, vol. 18, Oct. 1973, p. 261-271.  
(Also published in International Astronautical Congress, 22nd, Brussels, Belgium, Sept. 20-25, 1971. Papers.)
1382. Regestein, Q. R.; Buckland, G. H.; and Pegram, G. V.  
Effect of Daytime Alpha Rhythm Maintenance on Subsequent Sleep. *Psychosomatic Medicine*, vol. 35, Sept. 1973, p. 415-418.
1383. Rockstein, M.; and Miquel, J.  
Aging in Insects. In Rockstein, M., Editor. *Physiology of the Insecta*. 2d ed. N. Y., Academic Press, 1973. Vol. 1, p. 371-478.
1384. Sabine, J. C.; and Leon, H. A.  
Anaerobic Glycolysis and Specific Gravity of the Red Blood Cells of Rats Exposed to Pure Oxygen at 600 Torr. *Aerospace Medicine*, vol. 42, July 1971, p. 768-772.
1385. Sabine, J. C.  
Apparent Paradoxical Patterns of Anaerobic Glycolysis and Hexokinase Activity in the Red Blood Cells of Acutely Bled Rats, with Evidence That the Responses Were in Part Hormone-Dependent. *British Journal of Haematology*, vol. 23, Oct. 1972, p. 491-498.
1386. Sandler, H.; and Rasmussen, D.  
Angiographic Analysis of Heart Geometry. In Roentgen-, Cine- and Videodensitometry Fundamentals and Applications for Blood Flow and Heart Volume Determination. Heintzen, P. H., Editor. Stuttgart, Georg Thieme Verlag, 1971. p. 212-223.
1387. Sandler, H.; Fryer, T. B.; and Westbrook, R. M.  
Single and Multichannel Implanted Telemetry Systems. In Biotelemetry; Proceedings of the International Symposium, Nijmegen, the Netherlands, May 5-8, 1971. Kimmich, H. P. and Vos, J. A., Editor. Leiden, Meander, 1972. p. 345-352.

1388. Sandler, H.; and Rasmussen, D.  
The Use of Computer Graphic Techniques for the Determination of Ventricular Function. In Computers in Biomedicine; Hawaii International Conference on System Sciences, 5th, University of Hawaii, Honolulu, Hawaii, Jan. 11-13, 1972. Proceedings. Supplement. North Hollywood, Calif., Western Periodicals Co., 1972. p. 63-65.
1389. Shapira, J.  
Chemically Regenerated Foods. Environmental Biology and Medicine, vol. 1, 1971, p. 243-251.
1390. Shapira, J.; Coleman, J. O.; and Castellani, P. C. F.  
Differential Nucleic Acid Metabolism of Planarial Segments. In Biology of Turbellaria: Experimental Advances. N. Y., MSS Information Corp., 1973, p. 10-13.
1391. Shapira, J.  
Effect of Large Amounts of Dihydroxyacetone in the Diet of Rats. Western Pharmacology Society, Meeting, San Francisco, Calif., Jan. 31-Feb. 2, 1972. Proceedings, vol. 15, 1972. p. 65-67.
1392. Shapira, J.; Putkey, T.; Furst, A.; and McCasland, G. A.  
Gas-Liquid Chromatography of Trifluoroacetyl Derivatives of Cyclitols. Carbohydrate Research, vol. 25, Dec. 1972, p. 535-539.
1393. Shapira, J.; Lecocq, J.; Furst, A.; and Weetall, H. H.  
Properties of Hexokinase Bound to Glass. Experientia, vol. 28, Oct. 1972, p. 1261-1262.
1394. Shitzer, A.; and Chambers, A. B.  
Comparative Study of Patches for Liquid Cooled Garments. Journal of Spacecraft and Rockets, vol. 10, Aug. 1973, p. 541-544.
1395. Smith, R. L.  
The Ascending Fiber Projections from the Principal Sensory Trigeminal Nucleus in the Rat. Journal of Comparative Neurology, vol. 148, April 15, 1973, p. 423-445.
1396. South, F. E.; Heath, J. E.; Luecke, R. H.; Mihailovic, Lj. T.; Myers, R. D.; Panuska, J. A.; Williams, B. A.; Hartner, W. C.; and Jacobs, H. K.  
Status of the Role of the Central Nervous System and Thermoregulation During Hibernation and Hypothermia. Hibernation and Hypothermia, Perspectives and Challenges, Snowmass-At-Aspen, Colorado, Jan. 3-8, 1971. Symposium. South, F. E.; Hannon, J. P.; Willis, J. R.; Pengelley, E. T.; and Alpert, N. R., Editors. N. Y., Elsevier Publ. Co., 1972. p. 629-633.

1397. Stewart, J. D.; and Clark, B.  
Correlation between Five Measures of Vestibular Function for  
Airline Pilots. In Aerospace Medical Association. Annual Scientific  
Meeting, 43rd, Bal Harbour, May 8-11, 1972. Preprints of the  
Scientific Program. p. 20-21.
1398. Stone, H. L.; Stegall, H. F.; Kardon, M. B.; Sandler, H.; and  
Payne, R. M.  
Changes in Aortic, Coronary, and Carotid Flows During +G<sub>z</sub> Accelera-  
tion. *Journal of Applied Physiology*, vol. 30, Jan. 1971, p. 21-26.
1399. Takahashi, A.; and Philpott, D. E.  
A Possible Origin of Myeloid Bodies in Oxygen Exposed Tissues.  
Electron Microscopy Society of America. 30th Annual Conference,  
Los Angeles, Aug. 14-17, 1972. Proceedings, 1972.
1400. Taketa, S. T.  
Relationship Between Metabolism and Radiosensitivity. In International  
Symposium on Biological Aspects of Radiation Protection, Kyoto, Oct.  
1969. Proceedings. Sugahara, T.; and Hug, O., Editors. Tokyo Igaku  
Shoin; Berlin, N. Y., Springer-Verlag, 1971. p. 219-232.
1401. van Beaumont, W.; and Greenleaf, J. E.  
Comparative Changes in Plasma Volume, Hematocrit, Plasma Electrolytes  
and Plasma Proteins during Maximal Exercise. *Medicine and Science  
in Sports*, vol. 4, 1972, p. 59.
1402. Vykukal, H. C.; King, R. F.; and Vallotton, W. C.  
An Anthropomorphic Master-Slave Manipulator System. In Remotely  
Manned Systems Exploration; and Operation in Space; First National  
Conference, Pasadena, Calif., September 13-15, 1972. Proceedings.  
Heer, E., Editor. Pasadena, California Institute of Technology, 1973.  
p. 199-205.
1403. Wagman, I. H.; and Mehler, W. R.  
Physiology and Anatomy of the Cortico-Oculomotor Mechanism. *Progress  
in Brain Research*. Vol. 37, Basic Aspects of Central Vestibular  
Mechanisms. Amsterdam, Elsevier Publ. Co., 1972, p. 619-635.
1404. Weiss, A. H.; and Shapira, J.  
Manufacture of Sugars. In Food and Bioengineering--Fundamental and  
Industrial Aspects. Lawrence, B.; and Koval, E. J., Editors. New York,  
American Institute of Chemical Engineers, 1971. p. 137-147.  
(Chemical Engineering Progress Symposium Series, v. 67, no. 108)
1405. Weiss, A. H.; Tambawala, H.; Partridge, R. D.; and Shapira, J.  
Polyols from Formaldehyde. *Dechema-Monographien*, vol. 68, 1971, p. 3-  
27.  
(Also published as NASA CR-69120)

1406. Weissbart, J.; Smart, W. H.; and Wydeven, T.  
Design and Performance of a Solid Electrolyte Oxygen Generator Test Module. American Society of Mechanical Engineers, Society of Automotive Engineers, and American Institute of Aeronautics and Astronautics. Life Support and Environmental Control Conference, San Francisco, Calif., Jul. 12-14, 1971. ASME Paper 71-Av-8.
1407. Weissbart, J.; Smart, W. H.; and Wydeven, T.  
Regeneration of Oxygen from Carbon Dioxide and Water. International Astronautical Federation. International Astronautical Congress, 23rd, Vienna, Austria, Oct. 8-15, 1972, Paper. p. 167-174.
1408. West, J. B.; Maloney, J. E.; and Castle, B. L.  
Effect of Stratified Inequality of Blood Flow on Gas Exchange in Liquid-Filled Lungs. Journal of Applied Physiology, vol. 32, Mar. 1972, p. 357-361.
1409. Williams, B.; Shitzer, A.; and Elkins, W.  
A Liquid-Cooled Aircrew Helmet Liner for Thermal Comfort. In Aerospace Medical Association. Annual Scientific Meeting, Las Vegas, May 7-10, 1973. Preprints of the Scientific Program. p. 13-14.
1410. Williams, B.  
Reduction of Heat Strain in Man with Head Cooling. In Problems of Heat and Mass Transfer in Biotechnology, Urbana, Illinois, Sept. 16-19, 1973. Proceedings of the Conference. p. 128.
1411. Williams, B. A.; and Reese, R. D.  
Effect of Bedrest on Thermoregulation. In Aerospace Medical Association. Annual Scientific Meeting, 43rd, Bal Harbour, May 8-11, 1972. Preprints of the Scientific Program. p. 140-141.
1412. Williams, B. A.; and Heath, J. E.  
Heat Balance During Preoptic Heating and Cooling in the Ground Squirrel, *Citellus tridecemlineatus*. Comparative Biochemistry and Physiology, vol. 40A, Nov. 1971, p. 815-821.
1413. Williams, B. A.; and Heath, J. E.  
Thermoregulatory Responses of a Hibernator to Preoptic and Environmental Temperatures. American Journal of Physiology, vol. 221, Oct. 1971, p. 1134-1138.
1414. Wydeven, T.; and Leban, M.  
Performance of Cellulose Acetate Butyrate Membranes in Hyperfiltration of Sodium Chloride and Urea Feed Solution. Journal of Applied Polymer Science, vol. 17, July, 1973, p. 2277-2287.

1415. Wynveen, R. A.; and Quattrone, P. D.  
Electrochemical Carbon Dioxide Concentrating System. American Society of Mechanical Engineers, Society of Automotive Engineers, and American Institute of Aeronautics and Astronautics. Life Support and Environmental Control Conference, San Francisco, Calif., July 12-14, 1971. ASME Paper 71-Av-21.
1416. Young, H. L.; Chao, F. C.; Turnbill, C.; and Philpott, D. E.  
Ultrastructure of Pseudomonas saccharophila at Early and Late Log Phase of Growth. Journal of Bacteriology, vol. 109, Feb. 1972, p. 862-868.
1417. Zahn, J. R.; and Haines, R. F.  
The Influence of Central Search Task Luminance upon Peripheral Visual Detection Time. Psychonomic Science, vol. 24, Sept. 25, 1971, p. 271-273.

#### PATENTS

1418. Chambers, A. B.; Blackaby, J. R.; and Billingham, J.  
Temperature Controller for a Fluid Cooled Garment. June 5, 1973.  
US-PATENT-3,736,764
1419. Haines, R. F.; Fitzgerald, J. W.; and Rositano, S. A.  
Visual Examination Apparatus. June 5, 1973.  
US-PATENT-3,737,217
1420. Hollahan, J. R.; and Wydeven, T.  
Protection of Moisture Sensitive Optical Components. Oct. 2, 1973.  
US-PATENT-APPL-SN-402866
1421. Hollahan, J. R.; and Wydeven, T.  
Water Purification Membranes and Method of Preparation. Dec. 8, 1972.  
US-PATENT-APPL-SN-313389
1422. Jones, J. L.  
Stereoscopic Television System and Apparatus. June 13, 1972.  
US-PATENT-3,670,097
1423. Leon, H. A.; Connolly, J. P.; Hitchman, M. J.; and Humbert, J. E.  
Automatic Real-Time Pair Feeding System for Animals. Nov. 30, 1971.  
US-PATENT-APPL-SN-203271
1424. Vykukal, H. C.  
Locomotion and Restraint Aid Patent. June 8, 1971.  
US-PATENT-3,583,322
1425. Vykukal, H. C.  
Space Suit Having Improved Waist and Torso Movement. Jan. 25, 1972.  
US-PATENT-3,636,564.



ENVIRONMENTAL BIOLOGY DIVISION

FORMAL REPORTS

1426. Vernikos-Danellis, J.  
Joint Ames Research Center/Manned Spacecraft Center Study: Diurnal  
Variation in Adrenocortical and Thyroid Function During Prolonged  
Bedrest. In Manned Spacecraft Center Endocrine Program Conference,  
Houston, 1970. Proceedings, 1971. Aug. 1971. p. 5-1 - 5-5.  
NASA TM-X-58068 N71-36458

NASA CONTRACTOR REPORTS

1427. Hanley, L. D.; and Kress, D.  
Study Directed at Development of an Implantable Biotelemetry Ion  
Detector. (R-701, Massachusetts Inst. of Tech., Cambridge; NAS2-  
5951.) Nov. 1971.  
NASA CR-114415 N72-17080

JOURNAL ARTICLES, MEETING PAPERS, BOOKS AND CHAPTERS OF BOOKS

1428. Anliker, M.; Yates, W. G.; and Ogden, E.  
Transmission of Small Pressure Waves in the Canine Vena Cava. American  
Journal of Physiology, vol. 221, Aug. 1971, p. 644-651.
1429. Callahan, P. X.; McDonald, J. K.; and Ellis, S.  
Sequencing of Peptides with Dipeptidyl Aminopeptidase I. Methods in  
Enzymology. Vol. 25, Enzyme Structure. Part B. N. Y., Academic  
Press, 1972. p. 282-298.
1430. Conner, R. L.; Vernikos-Danellis, J.; and Levine, S.  
Stress, Fighting and Neuroendocrine Function. Nature, vol. 234, Dec.  
31, 1971, p. 564-566.
1431. Corbett, R. L.  
Modification for Electron Microscopy of the Corbett Ammoniacal Silver  
Stain. In Electron Microscope Society of America. 29th Annual  
Conference, Boston, Aug. 9-15, 1971. Proceedings. p. 484-485.
1432. Daniels-Severs, A.; Ogden, E.; and Vernikos-Danellis, J.  
Centrally Mediated Effects of Angiotensin II in the Unanesthetized  
Rat. Physiology and Behavior, vol. 7, Nov. 1971, p. 785-787.

1433. Ellis, S.; Lorenson, M.; Grindeland, R. E.; and Callahan, P. X. Separation of the Phenylalanyl and Alanyl Chains of Bovine and Ovine Growth Hormones by Electrofocusing. Growth and Growth Hormone, 2nd International Symposium, Milan, Italy, May 5-7, 1971. Proceedings. Excerpta Medica International Congress Series No. 244, p. 55-67.
1434. Feller, D. D.; Neville, E. D.; and Talarico, K. S. Effects of Exposing Rats to 100% Oxygen at 450 and 600 mm Hg on in vitro Liver and Adipose Tissue Lipid Synthesis. Aerospace Medicine, vol. 43, Mar. 1972, p. 310-313.
1435. Feller, D. D.; Neville, E. D.; and Talarico, K. S. Effects of Hypobaric Hyperoxia in vivo on Lipid Synthesis in Rat Liver and Adipose Tissue Slices. Aerospace Medicine, vol. 42, Sept. 1971, p. 949-956.
1436. Furner, R. L. Automated Method for Studying the Hepatic Metabolism of Aniline, Ethylmorphine or p-Nitroanisole. Biochemical Pharmacology, vol. 20, Nov. 1971, p. 3161-3168.
1437. Furner, R. L.; Neville, E. D.; Talarico, K. S.; and Feller, D. D. Effects of Pentobarbital on Plasma Glucose and Free Fatty Acids in the Rat. Society for Experimental Biology and Medicine. Proceedings, vol. 139, Jan. 1972, p. 231-234.
1438. Furner, R. L.; and Feller, D. D. The Influence of Starvation upon Hepatic Drug Metabolism in Rats, Mice, and Guinea Pigs. Society for Experimental Biology and Medicine. Proceedings, vol. 137, July 1971, p. 816-819.
1439. Gualtierotti, T.; Bracchi, F.; and Rocca, E. Orbiting Frog Otolith Experiment (OFO-A), Final Report on the Data Reduction and Control Experimentation. Piccin Medical Books, Jan. 1972. p. 1-1 - 14-1.
1440. Haymaker, W.; Ibrahim, M. Z. M.; Miquel, J.; Call, N.; Noden, P.; Ashley, W.; Ballinger, E. R.; Ghidoni, J.; Lindsay, I. R.; Behar, A. J.; and Baker, G. Acute Changes in the Central Nervous System of Monkeys Exposed to Protons. Journal of Neuropathology and Experimental Neurology, vol. 31, Jan. 1972, p. 72-101.
1441. Haymaker, W.; Rubinstein, L. J.; and Miquel, J. Brain Tumors in Irradiated Monkeys. Acta Neuropathologica, vol. 20, 1972, p. 267-277.
1442. Haymaker, W.; and Kuhlenbeck, H. Disorders of the Brainstem and Its Cranial Nerves. Clinical Neurology. Baker, A. B., Editor. 3d ed. N. Y., Hoeber, 1971. Vol. 3, p. 1-82.

1443. Haymaker, W.; and Anderson, E.  
Disorders of the Hypothalamus and Pituitary Gland. Clinical  
Neurology. Baker, A. B., Editor. 3d ed. N. Y., Hoeber, 1971, Vol. 2,  
p. 1-78.
1444. Herman, M. M.; Miquel, J.; and Johnson, M.  
Insect Brain as a Model for the Study of Aging: Age-Related Changes  
in Drosophila melanogaster. Acta Neuropathologica, vol. 19, Dec. 17,  
1971, p. 167-183.
1445. Hetherington, N. W.; Winget, C. M.; Rosenblatt, L. S.; and Mack, P. B.  
The Summation-Dial, a Vectorial Representation of Time Series Data.  
Journal of Interdisciplinary Cycle Research, vol. 2, Aug. 1971, p. 365-  
377.
1446. Ito, A.; Martin, J. M.; Grindeland, R. E.; Takizawa, S.; and Furth, J.  
Mammotropic and Somatotropic Hormones in Sera of Normal Rats and in  
Rats Bearing Primary and Grafted Pituitary Tumors. International  
Journal of Cancer, vol. 7, May 1971, p. 416-429.
1447. Jones, E.; Anliker, M.; and Chang, I.  
Effects of Viscosity and Constraints on the Dispersion and Dissipation  
of Waves in Large Blood Vessels. I. Theoretical Analysis. Bio-  
physical Journal, vol. 11, Dec. 1971, p. 1085-1120.
1448. Jones, E.; Anliker, M.; and Chang, I.  
Effects of Viscosity and Constraints on the Dispersion and Dissipation  
of Waves in Large Blood Vessels. II. Comparison of Analysis with  
Experiments. Biophysical Journal, vol. 11, Dec. 1971, p. 1121-1134.
1449. Lee, H.; and Young, H. L.  
Marrow Cell Distribution Determined by Cellular Dry Mass in Mice  
Exposed to Increased Gravity. Cytobios, vol. 3, March 1971, p. 87-  
95.
1450. Lee, H.; and Young, H. L.  
Reduction of Mitotic Activity in Bone Marrow of Mice Subjected to  
Chronic Centrifugation. Cytobios, vol. 4, Dec. 1971, p. 167-170.
1451. McDonald, J. K.; Zeitman, B. B.; and Ellis, S.  
Detection of a Lysosomal Carboxypeptidase and a Lysosomal Dipeptidase  
in Highly-Purified Dipeptidyl Aminopeptidase I (Cathepsin C) and the  
Elimination of Their Activities from Preparations Used to Sequence  
Peptides. Biochemical and Biophysical Research Communications, vol.  
46, Jan. 14, 1972, p. 62-70.
1452. Mehler, W. R.  
Comparative Anatomy of the Vestibular Nuclear Complex in Submammalian  
Vertebrates. In Symposium on Basic Aspects of Central Vestibular  
Mechanisms, Pisa, Italy, 15-17 July 1971. Basic Aspects of Central  
Vestibular Mechanisms. Brodal, A. and Pompeiano, O., Editors. N. Y.,  
Elsevier, 1972. (Progress in Brain Research, vol. 37, 1972, p. 55-67.)

1453. Mehler, W. R.  
Idea of a New Anatomy of the Thalamus. *Journal of Psychiatric Research*,  
vol. 8, Aug. 1971, p. 203-217.
1454. Miquel, J.  
Aging of Male Drosophila melanogaster: Histological, Histochemical,  
and Ultrastructural Observations. *In Advances in Gerontological  
Research*, vol. 3, 1971, p. 39-71.
1455. Miquel, J.; Bensch, K. G.; and Philpott, D. E.  
Viruslike Particles in the Tissues of Normal and  $\gamma$ -Irradiated  
Drosophila melanogaster. *Journal of Invertebrate Pathology*, vol. 19,  
Jan. 1972, p. 156-159.
1456. Neville, E. D.; and Feller, D. D.  
An Improved Animal Chamber for Use in Radiorespirometry Studies.  
*Analytical Biochemistry*, vol. 44, Dec. 1971, p. 445-450.
1457. Neville, E. D.; Feller, D. D.; and Dolkas, C. B.  
System Distortion Errors in Radiorespirometry Curves. *International  
Journal of Applied Radiation and Isotopes*, vol. 22, July 1971, p. 434-  
439.
1458. Oyama, J.; Platt, W. T.; and Holland, V. B.  
Deep-Body Temperature Changes in Rats Exposed to Chronic Centrifugation.  
*American Journal of Physiology*, vol. 221, Nov. 1971, p. 1271-1277.
1459. Philpott, D. E.  
High Oxygen Pressures as a Contributing Factor in Retinal Detachments.  
Electron Microscopy Association. 29th Annual Conference, Boston,  
Mass., Aug. 9-15, 1971. *Proceedings*. p. 560.
1460. Philpott, D. E.; and Turnbill, C.  
The Microscopic Examination of the Apollo-11 and -12 Sample and the  
Quest for Life Forms. *Journal of Ultrastructure Research*, vol. 35,  
June 1971, p. 403-410.
1461. Rubinstein, L. J.; Herman, M. M.; Miquel, J.; and Weibel, J.  
The Short- and Long-Term Effects of Ultraviolet Irradiation on the  
Exposed Cat Cerebrum: Light-Microscopic, Enzyme-Histochemical and  
Fine-Structural Observations. *Journal of the Neurological Sciences*,  
vol. 13, July 1971, p. 351-375.
1462. Sakellaris, P. C.  
Olfactory Thresholds in Normal and Adrenalectomized Rats. *Physiology  
and Behavior*, vol. 9, Oct. 1972, p. 495-500.
1463. von Bonin, G.; and Mehler, W. R.  
On Columnar Arrangement of Nerve Cells in Cerebral Cortex. *Brain  
Research*, vol. 27, 19 March, 1971, p. 1-9.

EXOBIOLOGY DIVISION

FORMAL REPORTS

1464. Young, R. S.; Tremor, J. W.; Willoughby, R.; Corbett, R. L.; Souza, K. A.; and Sebesta, P. D.  
The Effect of Weightlessness on the Dividing Eggs of Rana pipiens.  
In The Experiments of Biosatellite 2. J. F. Saunders, Editor. 1971.  
p. 251-271.  
NASA SP-204 N72-20060
1465. Young, R. S.; and Tremor, J. W.  
Frog Egg Growth, Experiment S003. In NASA. Manned Spacecraft Center,  
Houston. The Gemini Program Biomedical Sciences Experiments Summary.  
Zeitler, E. O.; and Rogers, T. G., Compilers. Sept. 1971. p. 237-244.  
NASA TM-X-58074 N72-14064
1466. Young, R. S.  
Sea Urchin Egg Fertilization and Development. In NASA. Manned Space-  
craft Center, Houston. The Gemini Program Biomedical Sciences Experi-  
ments Summary. Zeitler, E. O.; and Rogers, T. G., Compilers. Sept.  
1971, p. 245-247.  
NASA TM-X-58074 N72-14065

JOURNAL ARTICLES, MEETING PAPERS, BOOKS AND CHAPTERS OF BOOKS

1467. Asato, Y.  
Isolation and Characterization of Ultraviolet Light-Sensitive Mutants  
of the Blue-Green Alga Anacystis nidulans. Journal of Bacteriology,  
vol. 110, June 1972, p. 1058-1064.
1468. Asato, Y.  
Photorecovery of Gamma Irradiated Cultures of Blue-Green Alga,  
Anacystis nidulans. Radiation Botany, vol. 11, 1971, p. 313-316.
1469. Ballard, R. W.; and MacElroy, R. D.  
Phosphoenolpyruvate, a New Inhibitor of Phosphoribulokinase in  
Pseudomonas facilis. Biochemical and Biophysical Research  
Communications, vol. 44, Aug. 6, 1971, p. 614-618.
1470. Bonner, W. A.  
The Adaptation of Diastereomeric S-Prolyl Dipeptide Derivatives to the  
Quantitative Estimation of R- and S-Leucine Enantiomers. Journal of  
Chromatographic Science, vol. 10, Mar. 1972, p. 159-164.

1471. Boylen, C. W.  
Installation and Use of the Microscope Within a Gastight Glove Box. *Applied Microbiology*, vol. 21, June 1971, p. 1089-1090.
1472. Buhl, D.; and Ponnampereuma, C.  
Interstellar Molecules and the Origin of Life. *Space Life Sciences*, vol. 3, Dec. 1971, p. 157-164.
1473. Buvet, R.; and Ponnampereuma, C., Editors.  
Chemical Evolution and the Origin of Life; Proceedings of the 3rd International Conference, Pont-A-Mousson, France, April 19-25, 1970. Amsterdam, North Holland Publishing Company, 1971. Vol. 1, Molecular Evolution.
1474. Chadha, M. S.; Lawless, J. G.; Flores, J. J.; and Ponnampereuma, C.  
Experiments in Jovian Atmosphere. In Chemical Evolution and the Origin of Life; Proceedings of the 3rd International Conference, Pont-A-Mousson, France, April 19-25, 1970. Amsterdam, North-Holland Publishing Co., 1971. Vol. 1, Molecular Evolution, p. 143-151.
1475. Chadha, M. S.; Flores, J. J.; Lawless, J. G.; and Ponnampereuma, C.  
Organic Synthesis in a Simulated Jovian Atmosphere, II. *Icarus*, vol. 15, Aug. 1971, p. 39-44.
1476. Chadha, M. S.; Replogle, L.; Flores, J.; and Ponnampereuma, C.  
Possible Role of Aminoacetonitrile in Chemical Evolution. *Bioorganic Chemistry*, vol. 1, Nov. 1971, p. 269-274.
1477. Chang, S.; Kvenvolden, K.; Lawless, J.; Ponnampereuma, C.; and Kaplan, I. R.  
Carbon, Carbides, and Methane in an Apollo 12 Sample. *Science*, vol. 171, 5 Feb., 1971, p. 474-477.
1478. Flores, J. J.; and Ponnampereuma, C.  
Polymerization of Amino Acids under Primitive Earth Conditions. *Journal of Molecular Evolution*, vol. 2, Dec. 29, 1972, p. 1-9.
1479. Folsome, C. E.; Lawless, J.; Romiez, M.; and Ponnampereuma, C.  
Heterocyclic Compounds Indigenous to the Murchison Meteorite. *Nature*, vol. 232, July 9, 1971, p. 108-109.
1480. Gehrke, C. W.; Zumwalt, R. W.; Kuo, K.; Aue, W. A.; Stalling, D. L.; Kvenvolden, K. A.; and Ponnampereuma, C.  
Amino Acid Analyses of Apollo 14 Samples. In Lunar Science Conference, 3rd, Houston, Jan. 10-13, 1972. Proceedings. Cambridge, Mass., MIT Press, 1972. vol. 2, p. 2119-2129.

1481. Gehrke, C. W.; Zumwalt, R. W.; Kuo, K.; Rash, J. J.; Aue, W. A.; Stalling, D. L.; Kvenvolden, K. A.; and Ponnampuruma, C. Research for Amino Acids in Lunar Samples. *Space Life Sciences*, vol. 3, Oct. 1972, p. 439-449.
1482. Gehrke, C. W.; Zumwalt, R. W.; Stalling, D. L.; Roach, D.; Aue, W. A.; Ponnampuruma, C.; and Kvenvolden, K. A. A Search for Amino Acids in Apollo 11 and 12 Lunar Fines. *Journal of Chromatography*, vol. 59, July 22, 1971, p. 305-319.
1483. Heinrich, M. R. Solvent Effects on Enzymes: Implications for Extraterrestrial Life. *In Molecular Evolution: Prebiological and Biological*. Rohlfsing, D. L.; and Oparin, A. I., Editors. New York, Plenum Press, 1972. p. 331-339.
1484. Hodgson, G. W.; Bunnenberg, E.; Halpern, B.; Peterson, E.; Kvenvolden, K. A.; and Ponnampuruma, C. Lunar Pigments: Porphyrin-Like Compounds from an Apollo 12 Sample. *In Lunar Science Conference, 2nd, Houston, Jan. 11-14, 1971. Proceedings*. Cambridge, Mass., MIT Press, 1971. Vol. 2. p. 1865-1874.
1485. Kostiw, L. L.; Boylen, C. W.; and Tyson, B. J. Lipid Composition of Growing and Starving Cells of Arthrobacter crystallopoietes. *Journal of Bacteriology*, vol. 111, July 1972, p. 103-111.
1486. Kvenvolden, K. A. Analysis of Lunar Samples for Carbon Compounds. *In Theory and Experiment in Exobiology*. Swartz, A. W., Editor. Groningen, Wolters-Noordhoff Publishing, 1971. Vol. 1, p. 105-121.
1487. Kvenvolden, K. A.; and Roedder, E. Fluid Inclusions in Quartz Crystals from South-West Africa. *Geochimica et Cosmochimica Acta*, vol. 35, Dec. 1971, p. 1209-1229.
1488. Kvenvolden, K. A.; Peterson, E.; Pollock, G. E. Geochemistry of Amino Acid Enantiomers: Gas Chromatography of Their Diastereomeric Derivatives. *In Advances in Organic Geochemistry 1971; Proceedings of the 5th International Meeting, Hanover, West Germany, Sept. 7-10, 1971*. Gaetner, H. R.; and Wehner, H., Editors. Oxford and New York, Pergamon Press, 1972. p. 387-400; Discussion, p. 401.
1489. Kvenvolden, K. A. Review of Methods Used in Lunar Organic Analysis: Extraction and Hydrolysis Techniques. *Space Life Sciences*, vol. 3, Oct. 1972, p. 330-341.

1490. Lanyi, J. K.; and Silverman, M. P.  
The State of Binding of Intracellular  $K^+$  in Halobacterium cutirubrum.  
Canadian Journal of Microbiology, vol. 18, July 1972, p. 993-995.
1491. Lanyi, J. K.  
Studies of the Electron Transport Chain of Extremely Halophilic Bacteria.  
VI. Salt Dependent Dissolution of the Cell Envelope. Journal of  
Biological Chemistry, vol. 246, July 25, 1971, p. 4552-4559.
1492. Lanyi, J. K.  
Studies of the Electron Transport Chain of Extremely Halophilic  
Bacteria. VII. Solubilization Properties of Menadione Reductase.  
Journal of Biological Chemistry, vol. 247, May 25, 1972, p. 3001-3007.
1493. Lanyi, J. K.  
Studies of the Electron Transport Chain of Extremely Halophilic Bacteria.  
VIII. Respiration-Dependent Detergent Dissolution of Cell Envelopes.  
Biochimica et Biophysica Acta, vol. 282, Sept. 1972, p. 439-446.
1494. Lawless, J. G.; Kvenvolden, K. A.; Peterson, E.; Ponnampereuma, C.;  
and Moore, C.  
Amino Acids Indigenous to the Murray Meteorite. Science, vol. 173,  
Aug. 13, 1971, p. 626-627.
1495. Lawless, J. G.; Kvenvolden, K. A.; Peterson, E.; Ponnampereuma, C.;  
and Jarosewich, E.  
Evidence for Amino-Acids of Extraterrestrial Origin in the Orgueil  
Meteorite. Nature, vol. 236, Mar. 10, 1972, p. 66-67.
1496. Lawless, J. G.; and Chadha, M. S.  
Mass Spectral Analysis of  $C_3$  and  $C_4$  Aliphatic Amino Acid Derivatives.  
Analytical Biochemistry, vol. 44, Dec. 1971 p. 473-485.
1497. Lawless, J. G.; Folsome, C. E.; and Kvenvolden, K. A.  
Organic Matter in Meteorites. Scientific American, vol. 226, June  
1972, p. 38-46.
1498. Lieberman, M. M.; and Lanyi, J. K.  
Studies of the Electron Transport Chain of Extremely Halophilic  
Bacteria. V. Mode of Action of Salts on Cytochrome Oxidase.  
Biochimica et Biophysica Acta, vol. 245, Aug. 6, 1971, p. 21-23.
1499. Lieberman, M. M.; and Lanyi, J. K.  
Threonine Deaminase from Extremely Halophilic Bacteria. Cooperative  
Substrate Kinetics and Salt Dependence. Biochemistry, vol. 11, no. 2,  
Jan. 18, 1972, p. 211-216.
1500. Loew, G. H.  
Conformation of Hydrogen Cyanide Dimer and Its Role in Chemical  
Evolution. Journal of Theoretical Biology, vol. 33, Oct. 1971,  
p. 121-130.



1501. Loew, G. H.  
Energy-Conformation Studies of HCN, HNC AND  $CN^-$ : A Comparison of Results from EH-SCC and SCF Molecular Orbital Calculations. *Theoretica Chimica Acta*, vol. 20, Feb. 17, 1971, p. 203-215.
1502. Loew, G. H.; and Chang, S.  
Energy-Conformation Studies of Hydrogen Cyanide Tetramer: A Prebiotic Precursor. *Theoretica Chimica Acta*, vol. 27, Sept. 21, 1972, p. 273-280.
1503. Loew, G. H.; and Chang, S.  
Quantum Chemical Study of HCN Dimer and Its Role in Chemical Evolution. In *European Biophysics Congress, 1st, Baden, Austria, Sept. 14-17, 1971. Proceedings.* Broda, E.; Locker, A.; and Springer-Lederer, H., Editors. Vienna, Verlag die Wiener Medizinischen Akademie, 1971. Vol. 4, p. 483-491.  
(Also published in *Tetrahedron*, vol. 27, July 1971, p. 2989-3001.)
1504. Loew, G. H.; and Chang, S.  
A Quantum Chemical study of HCN, HNC and  $CN^-$ . Application to Aspects of Organic Chemistry and Prebiotic Organic Synthesis. *Tetrahedron*, vol. 27, July 1971, p. 3069-3083.
1505. Lucero, D. P.; Smith, P. H.; and Johnson, R. D.  
A Hydrogen Flame Ionization Detector for Martian/Lunar Life Detection Experiments. *ISA Transactions*, vol. 10, Jan. 1971, p. 58-66.
1506. MacElroy, R. D.; Mack, H. M.; and Johnson, E. J.  
Properties of Phosphoribulokinase from *Thiobacillus neapolitanus*. *Journal of Bacteriology*, vol. 112, Oct. 1972, p. 532-538.
1507. MacElroy, R. D.; and Johnson, E. J.  
Regulation of Carbon Dioxide Fixation in Chemo-Autotrophic Bacteria. International Conference on Photosynthesis, 2nd, Stresa, Italy, June 24-29, 1971. *Proceedings.* Forti, G; Avron, M.; and Melandri, A., Editors. The Hague, Holland, 1972. p. 2089-2093.
1508. Miller, J. E.; and Hochstein, L. I.  
A Salt-Inhibited Cytochrome *c* Reductase Obtained from the Moderately Halophilic Bacterium, *Micrococcus halodenitrificans*. *Journal of Bacteriology*, vol. 112, Oct. 1972, p. 656-659.
1509. Molton, P. M.  
Exobiology, Jupiter and Life. *Spaceflight*, vol. 14, June 1972, p. 220-223.

1510. Molton, P.; and Ponnampereuma, C.  
Survival of Common Terrestrial Microorganisms under Simulated Jovian Conditions. *Nature*, vol. 238, July 28, 1972, p. 217-218.
1511. Noda, H.; and Ponnampereuma, C.  
Polymer Formation in a Simulated Jovian Atmosphere. *In* *Chemical Evolution and the Origin of Life; Proceedings of the 3rd International Conference, Pont-A-Mousson, France, Apr. 19-25, 1970.* Buvet, R.; and Ponnampereuma, C., Editors. Amsterdam, North-Holland Publishing Co., 1971. vol. 1, *Molecular Evolution*, p. 236-244.
1512. Oehler, D. Z.; Schopf, J. W.; and Kvenvolden, K. A.  
Carbon Isotopic Studies of Organic Matter in Precambrian Rocks. *Science*, vol. 175, March 17, 1972, p. 1246-1248.
1513. Oyama, V. I.  
The Gas Exchange Experiment for Life Detection: The Viking Mars Lander. *Icarus*, vol. 16, Feb. 1972, p. 167-184.
1514. Oyama, V. I.  
Search for Biogenic Structures and Viable Organisms in Lunar Samples: A Review. *Space Life Sciences*, vol. 3, Oct. 1972, p. 377-382.
1515. Oyama, V. I.; Merek, E. L.; Silverman, M. P.; and Boylen, C. W.  
Search for Viable Organisms in Lunar Samples: Further Biological Studies on Apollo 11 Core, Apollo 12 Bulk, and Apollo 12 Core Samples. *In* *Lunar Science Conference, 2nd, Houston, Jan. 11-14, 1971. Proceedings.* Cambridge, Mass., MIT Press, 1971. Vol. 2. p. 1931-1937.
1516. Pering, K. L.; and Ponnampereuma, C.  
Aromatic Hydrocarbons in the Murchison Meteorite. *Science*, vol. 173, July 16, 1971, p. 237-239.
1517. Pollock, G. E.  
Capillary Gas Chromatography with Two New Moderately High Temperature Phases. *Analytical Chemistry*, vol. 44, Mar. 1972, p. 634-635.
1518. Pollock, G. E.  
Resolution by Gas-Liquid Chromatography of Diastereomers of Five Nonprotein Amino Acids Known to Occur in the Murchison Meteorite. *Analytical Chemistry*, vol. 44, Dec. 1972, p. 2368-2372.
1519. Pollock, G. E.; Margozzi, A.; Donaldson, R.; and Woeller, F.  
Versatile Injection System for Gas Chromatography. *Analytical Chemistry*, vol. 43, July 1971, p. 1141-1142.
1520. Ponnampereuma, C.  
Organic Compounds in the Murchison Meteorite. *New York Academy of Sciences. Annals.* vol. 194, May 3, 1972, p. 56-70.

1521. Ponnampereuma, C.  
Primordial Organic Chemistry and the Origin of Life. *Quarterly Reviews of Biophysics*, vol. 4, May/Aug., 1971, p. 77-106.
1522. Ponnampereuma, C.; and Sweeney, M.  
The Role of Ionizing Radiation in Primordial Organic Synthesis. In *Theory and Experiment in Exobiology*. Schwartz, A. W., Editor. Groningen, Wolters-Noordhoff Publishing, 1971. vol. 1, p. 1-40.
1523. Ponnampereuma, C.; and Chang, S.  
The Role of Phosphates in Chemical Evolution. In *Chemical Evolution and the Origin of Life; Proceedings of the 3rd International Conference, Pont-A-Mousson, France, April 19-25, 1970*. Buvet, R.; and Ponnampereuma, C., Editors. Amsterdam, North-Holland Publishing Co., 1971. vol. 1, p. 216-223.
1524. Rabinowitz, J.; Chang, S.; and Ponnampereuma, C.  
Possible Mechanisms for Prebiotic Phosphorylation. *Prebiotic and Biochemical Evolution*. Kimball, A. P., and Oró, J., Editors. Amsterdam, North-Holland Publ. Co., 1971. p. 70-71.
1525. Rash, J. J.; Gehrke, C. W.; Zumwalt, R. W.; Kuo, K. C.; and Kvenvolden, K. A.  
GLC of Amino Acids: A survey of Contamination. *Journal of Chromatographic Science*, vol. 10, July 1972, p. 444-450.
1526. Sanyal, S. K.; Kvenvolden, K. A.; and Marsden, S. S., Jr.  
Permeabilities of Precambrian Onverwacht Cherts and Other Low Permeability Rocks. *Nature*, vol. 232, July 30, 1971, p. 325-327.
1527. Saxinger, C.; Ponnampereuma, C.; and Woese, C.  
Evidence for the Interaction of Nucleotides with Immobilized Amino-Acids and Its Significance for the Origin of the Genetic Code. *Nature: New Biology*, vol. 234, Dec. 8, 1971, p. 172-174.
1528. Saxinger, C.; and Ponnampereuma, C.  
Experimental Investigation on the Origin of the Genetic Code. *Journal of Molecular Evolution*, vol. 1, 1971, p. 63-73.
1529. Schein, A.; Berdahl, B. J.; Low, M.; and Borek, E.  
Deficiency of the DNA of Micrococcus radiodurans in Methyladenine and Methylcytosine. *Biochimica et Biophysica Acta*, vol. 272, July 1972, p. 481-485.
1530. Schopf, J. W.; Oehler, D. Z.; Horodyski, R. J.; and Kvenvolden, K. A.  
Biogenicity and Significance of the Oldest Known Stromatolites. *Journal of Paleontology*, vol. 45, May 1971, p. 477-485.

1531. Schramm, V. L.; and Hochstein, L. I.  
Purification, Crystallization, and Subunit Structure of Allosteric Adenosine 5' -Monophosphate Nucleosidase. *Biochemistry*, vol. 11, July 18 1972, p. 2777-2783.
1532. Schramm, V. L.; and Hochstein, L. I.  
Stabilization of Allosteric Adenosine Monophosphate Nucleosidase by Inorganic Salts, Substrate, and Essential Activator. *Biochemistry*, vol. 10, Aug. 31, 1971, p. 3411-3417.
1533. Silverman, M. P.; and Munoz, E. F.  
Fungal Leaching of Titanium from Rock. *Applied Microbiology*, vol. 22, Nov. 1971, p. 923-924.
1534. Souza, K. A.; Ginoza, H. S.; and Haight, R. D.  
Isolation of a Polyvalent Bacteriophage for Escherichia coli, Klebsiella pneumoniae, and Aerobacter aerogenes. *Journal of Virology*, vol. 9, May 1972, p. 851-856.
1535. Symmes, N. J.; and Weaver, E. C.  
Chloroplast Abnormalities Seen in a Pale Green Mutant of Chlamydomonas reinhardtii. In *Electron Microscopy Association. 29th Annual Conference, Boston, Mass., Aug. 9-15, 1971. Proceedings.* p. 350.
1536. Tomlinson, G. A.; and Hochstein, L. I.  
Isolation of Carbohydrate-Metabolizing, Extremely Halophilic Bacteria. *Canadian Journal of Microbiology*, vol. 18, May 1972, p. 698-701.
1537. Tomlinson, G. A.; and Hochstein, L. I.  
Studies on Acid Production During Carbohydrate Metabolism by Extremely Halophilic Bacteria. *Canadian Journal of Microbiology*, vol. 18, Dec. 1972, p. 1973-1976.
1538. West, M. W.; Gill, E. D.; and Ponnamperna, C.  
Chemical Evolution and the Origin of Life - Bibliography Supplement 1970. *Space Life Sciences*, vol. 3, June 1972, p. 293-304.
1539. Young, H. L.; Chao, F.-C.; Turnbull, C.; and Philpott, D. E.  
Ultrastructure of Pseudomonas saccharophila at Early and Late Log Phase of Growth. *Journal of Bacteriology*, vol. 109, Feb. 1972, p. 862-868.

#### PATENTS

1540. Pollock, G. E.; Henderson, M. E.; and Donaldson, R. W., Jr.  
Gas Chromatograph Injection System. Sept. 16, 1971.  
US-PATENT-APPL-SN-180962

PLANETARY BIOLOGY DIVISION

FORMAL REPORTS

1541. Lehwalt, M. E.; Woeller, F. H.; and Oyama, V. I.  
Biological Effects of Fuel and Exhaust Components from Spacecraft  
Descent Engines Employing Hydrazine. Jan. 1973.  
NASA TM-X-2714 N73-15118
1542. Romiez, M. P.  
Conversational High-Resolution Mass Spectrographic Data Reduction.  
Aug. 1973.  
NASA TM-X-2847 N73-27089

NASA CONTRACTOR REPORTS

1543. Chao, F.-C.  
Macromolecular Fractionation and Determination. Final Quarterly Report.  
(QR-13, Stanford Research Inst., Menlo Park, Calif.; NAS2-5754.) July  
1973.  
NASA CR-114673 N73-32009

JOURNAL ARTICLES, MEETING PAPERS, BOOKS AND CHAPTERS OF BOOKS

1544. Asato, Y.; and Ginoza, H. S.  
Separation of Small Circular DNA Molecules from the Blue-Green Alga  
Anacystis nidulans. Nature: New Biology, vol. 244, Aug. 1, 1973,  
p. 132-133.
1545. Bada, J. L.; Kvenvolden, K. A.; and Peterson, E.  
Racemization of Amino Acids in Bones. Nature, vol. 245, Oct. 12,  
1973, p. 308-310.
1546. Bell, P.; Burlingame, A.; Burnett, D.; Silver, L.; Chang, S.; Gault, D.;  
Eberhardt, P.; Haskin, L.; James, O.; Papike, J.; Reed, G.; Tökosz,  
N.; and Wood, J.  
Fourth Lunar Science Conference. Science, vol. 181, Aug. 17, 1973,  
p. 615-622.
1547. Bonner, W. A.; and Flores, J.  
On the Asymmetric Adsorption of Phenylalanine Enantiomers by Kaolin.  
Currents in Modern Biology, vol. 5, Mar. 1973, p. 103-113.

1548. Bonner, W. A.  
Origins of Molecular Chirality. In Exobiology. Ponnumperuma, C., Editor. Amsterdam, North-Holland, 1972, p. 170-234.
1549. Boylen, C. W.  
Survival of Arthrobacter crystallopoietes During Prolonged Periods of Extreme Desiccation. Journal of Bacteriology, vol. 113, Jan. 1973, p. 33-37.
1550. Carle, G. C.  
Determination of Chromatographic Resolution for Peaks of Vast Concentration Differences. Analytical Chemistry, vol. 44, Sept. 1972, p. 1905-1906.
1551. Chang, S.; Smith, J.; Sakai, H.; Petrowski, C.; Kvenvolden, K. A.; and Kaplan, I. R.  
Carbon, Nitrogen and Sulfur Released During Pyrolysis of Bulk Apollo 15 Fines. The Apollo 15 Lunar Samples. Chamberlain, J. W.; and Watkins, C., Editors. Houston, Texas, Lunar Science Institute, 1972. P. 291-293.
1552. Chang, S.; and Kvenvolden, K. A.  
Distribution and Significance of Carbon Compounds on the Moon. In Exobiology. Ponnampuruma, C., Editor. Amsterdam, North-Holland Publishing Co., 1972, p. 400-430.
1553. Chang, S.; and Young, R. S.  
The Organic Analysis and Carbon Chemistry of Lunar Samples: Their Significance for Exobiology. Space Life Sciences, vol. 3, Oct. 1972, p. 315-319.
1554. Chang, S.; and Young, R. S.  
Report of a Conference on "The Organic Analysis and Carbon Chemistry of Lunar Samples," Oct. 26-28, 1971, College Park, Maryland. Icarus, vol. 16, Dec. 1972, p. 578-580.
1555. Chang, S.; Kvenvolden, K. A.; and Gibson, E. K.  
Simulated Solar Wind Implantation of Carbon and Nitrogen Containing Ions into an Analogue of Lunar Fines. Lunar Science Conference, 4th, Houston, March 5-8, 1973. Lunar Science IV: Abstracts of Papers. Chamberlain, J. W.; and Watkins, C., Editors. Houston, Lunar Science Institute, 1973. p. 124-126.
1556. Chang, S.; Mack, R.; Gibson, E. K., Jr.; and Moore, G. W.  
Simulated Solar Wind Implantation of Carbon and Nitrogen Ions into Terrestrial Basalt and Lunar Fines. In Lunar Science Conference, 4th, Houston, Tex., March 5-8, 1973. Proceedings. New York, Pergamon Press, Inc., 1973. vol 2, p. 1509-1522.  
(Also published as Geochimica et Cosmochimica Acta, Suppl. 4, vol. 2, p. 1509-1522, 1973)

1557. Esser, A. F.  
The Presence of P700 in Chloroplast Fragments Prepared by Short Time Incubation with Triton X-100. *Biochimica et Biophysica Acta*, vol. 275, Aug. 1972, p. 199-207.
1558. Esser, A. F.; and Lanyi, J. K.  
Structure of the Lipid Phase in Cell Envelope Vesicles from Halobacterium cutirubrum. *Biochemistry*, vol. 12, May 8, 1973, p. 1933-1939.
1559. Flores, J. J.; and Leckie, J. O.  
Peptide Formation Mediated by Cyanate. *Nature*, vol. 244, Aug. 17, 1973, p. 435-437.
1560. Folsome, C. E.; Lawless, J. G.; Romiez, M.; and Ponnampereuma, C.  
Heterocyclic Compounds Recovered from Carbonaceous Chondrites. *Geochimica et Cosmochimica Acta*, vol. 37, Mar. 1973, p. 455-465.
1561. Hochstein, L. I.; and Dalton, B. P.  
Studies of a Halophilic NADH Dehydrogenase. I. Purification and Properties of the Enzyme. *Biochimica et Biophysica Acta*, vol. 302, Apr. 12, 1973, p. 216-228.
1562. Hodgson, G. W.; Kvenvolden, K.; Peterson, E.; and Ponnampereuma, C.  
A Quest for Porphyrins in Lunar Soil: Samples from Apollo 11, 12 and 14. *Space Life Sciences*, vol. 3, Oct. 1972, p. 419-424.
1563. Johnson, E. J.; and MacElroy, R. D.  
Regulation in the Chemolithotroph Thiobacillus neapolitanus: Fructose-1, 6-Diphosphatase. *Archiv für Mikrobiologie*, vol. 93, 1973, p. 23-28.
1564. Kostiw, L. L.; Vicher, E. E.; and Lyon, I.  
Fatty Acid Synthesis in Trichophyton rubrum. *Mycopathologia et Mycologia Applicata*, vol. 49, 1973, p. 67-76.
1565. Kvenvolden, K. A.  
Criteria for Distinguishing Biogenic and Abiogenic Amino Acids - Preliminary Considerations. *Space Life Sciences*, vol. 4, Jan. 1973, p. 60-68.
1566. Kvenvolden, K. A.  
Organic Geochemistry of Early Precambrian Sediments. Geological Congress, 24th International, Montreal, Canada, Aug. 21-30, 1972, p. 31-41.
1567. Kvenvolden, K. A.; Peterson, E.; Wehmiller, J.; and Hare, P. E.  
Racemization of Amino Acids in Marine Sediments Determined by Gas Chromatography. *Geochimica et Cosmochimica Acta*, vol. 37, Oct. 1973, p. 2215-2225.

1568. Lanyi, J. K.  
Influence of Electron Transport on the Interaction between Membrane Lipids and Triton X-100 in Halobacterium cutirubrum. *Biochemistry*, vol. 12, Mar. 27, 1973, p. 1433-1438.
1569. Lawless, J. G.  
Amino Acids in the Murchison Meteorite. *Geochimica et Cosmochimica Acta*, vol. 37, Sept. 1973, p. 2207-2212.
1570. Lawless, J. G.  
Did Life Come from Space? *Hermes*, vol. 20, July 1973, p. 71-73.
1571. Lawless, J. G.; Boynton, C.; Tarbox, F. C.; and Romiez, M.  
The Gas Chromatographic-Mass Spectrometric Identification of Organic Compounds in Meteorites. Conference on Mass Spectrometry and Allied Topics, 20th Annual, Dallas, June 4-9, 1972. Proceedings. Paper L11, p. 212.
1572. Lawless, J. G.; and Boynton, C. D.  
Thermal Synthesis of Amino Acids from a Simulated Primitive Atmosphere. *Nature*, vol. 243, June 15, 1973, p. 405-407.
1573. Loew, G. H.; Chadha, M. S.; and Chang, S.  
A Molecular Orbital and Chemical Study of Aminoacetonitrile: A Possible Prebiotic Peptide Precursor. *Journal of Theoretical Biology*, vol. 35, May 1972, p. 359-373.
1574. Merek, E. L.  
Imaging and Life Detection. *Bioscience*, vol. 23, Mar. 1973, p. 153-159.
1575. Molton, P.  
Limitations of Terrestrial Life. *Spaceflight*, vol. 15, Jan. 1973, p. 27-30.
1576. Molton, P.; Williams, J.; and Ponnampertuma, C.  
Survival of Common Bacteria in Liquid Culture Under Carbon Dioxide at High Temperatures. *Nature*, vol. 243, May 25, 1973, p. 242-243.
1577. O'Brien, W. E.; Singleton, R., Jr.; and Wood, H. G.  
Phosphoenolpyruvate Carboxytransphosphorylase; an Investigation of the Mechanism with <sup>18</sup>O. *Biochemistry*, vol. 12, Dec. 18, 1973, p. 5247-5253.
1578. Oyama, V. I.; Berdahl, B. J.; Boylen, C. W.; and Merek, E. L.  
Search for Viable Organisms in Lunar Samples: Gas Changes Over Apollo 14 Fines Wet by Aqueous Media. In Lunar Science Conference, 3rd, Houston, Jan. 10-13, 1972. Revised Abstracts. *Lunar Science--III*. Houston, Texas, Lunar Science Institute, 1972. p. 590-592.



1579. Oyama, V. I.; Berdahl, B. J.; and Merek, E. L.  
Search for Viable Organisms in Lunar Samples: The Oxidation of Metallic Iron and Gas Compositional Changes in Apollo 15 and 16 Samples, Significance for Water Activity on Mars. In Lunar Science Conference, 4th, Houston, March 5-8, 1973. Lunar Science IV: Abstracts of Papers. J. W. Chamberlain and C. Watkins, Editors. Houston, Texas, Lunar Science Institute, 1973, p. 578-580.
1580. Pering, K. L.  
Bitumens Associated with Lead, Zinc and Fluorite Ore Minerals in North Derbyshire, England. Geochimica et Cosmochimica Acta, vol. 37, Mar. 1973, p. 401-417.
1581. Pering, K. L.  
Microbial Alteration of Bitumens Associated with the Lead-Zinc Ore Deposits of North Derbyshire, England. Geological Congress, 24th International, Montreal, Canada, Aug. 21-30, 1972, p. 38-47.
1582. Ponnampuruma, C.; and Gabel, N. W.  
Prebiological Synthesis of Organic Compounds. In Chemistry in Space Research. Landel, R. F.; and Rembaum, A., Editors. N. Y., American Elsevier, 1972. p. 45-82.
1583. Ponnampuruma, C.; and Molton, P.  
The Prospect of Life on Jupiter. Space Life Sciences, vol. 4, Jan. 1973, p. 32-44.
1584. Sakai, H.; Chang, S.; Petrowski, C.; Smith, J.; and Kaplan, I. R.  
Distribution of Carbon and Sulfur in Hydrolyzed Apollo 15 Lunar Fines. In The Apollo 15 Lunar Samples. Chamberlain, J. W.; and Watkins, C., Editors. Houston, Texas, Lunar Science Institute, 1972. p. 319-323.
1585. Satyanarayana, T.; and Klein, H. P.  
Studies on Acetyl-Coenzyme A Synthetase of Yeast: Inhibition by Long-Chain Acyl-Coenzyme A Esters. Journal of Bacteriology, vol. 115, Aug. 1973, p. 600-606.
1586. Silverman, M. P.; and Munoz, E. F.  
Effect of Iron and Salt on Prodigiosin Synthesis in Serratia marcescens. Journal of Bacteriology, vol. 114, June 1973, p. 999-1006.
1587. Singleton, R., Jr.  
Bioorganic Chemistry of Phosphorus. Journal of Chemical Education, vol. 50, Aug. 1973, p. 538-544.
1588. Singleton, R., Jr.; and Amelunxen, R. E.  
Proteins from Thermophilic Microorganisms. Bacteriological Reviews, vol. 37, Sept. 1973, p. 320-342.

1589. Tremor, J. W.; and Souza, K. A.  
The Influence of Clinostat Rotation on the Fertilized Amphibian Egg.  
Space Life Sciences, vol. 3, June 1972, p. 179-191.
1590. Tyson, B. J.; and Oyama, V. I.  
Photoinduced Fixation of CO<sub>2</sub> by Amino Acids: Implications for Non-  
biological Reactions on the Martian Soil. Currents in Modern Biology,  
vol. 5, Mar. 1973, p. 98-102.
1591. Weerkamp, A.; and MacElroy, R. D.  
Lactate Dehydrogenase From an Extremely Thermophilic Bacillus. Archiv  
für Mikrobiologie, vol. 85, 1972, p. 113-122.
1592. Whitfield, O.; Merek, E. L.; and Oyama, V. I.  
Effect of Simulated Lunar Impact on the Survival of Bacterial Spores.  
Space Life Sciences, vol. 4, Apr. 1973, p. 291-294.
1593. Yuen, G. U.; and Kvenvolden, K. A.  
Monocarboxylic Acids in Murray and Murchison Carbonaceous Meteorites.  
Nature, vol. 246, Nov. 30, 1973, p. 301-303.

RESEARCH SUPPORT DIRECTORATE

FORMAL REPORTS

1594. Dimeff, J.  
Medical Electronics: A Need and a Challenge. In 1973 WESCON Technical  
Papers. Vol. 17, 1973.

N74-12602

JOURNAL ARTICLES, MEETING PAPERS, BOOKS AND CHAPTERS OF BOOKS

1595. Dimeff, J.; Donaldson, R. W.; Gunter, W. D., Jr.; Jaynes, D. N.;  
Margozi, A. P.; Deboo, G. J.; McClatchie, E. A.; and Williams, K. G.  
Heterodyne Method for High Specificity Gas Detection. ACS, AIAA, EPA,  
IEEE, ISA, NASA, and NOAA. Joint Conference on Sensing of Environmental  
Pollutants, Palo Alto, Calif., Nov. 8-10, 1971. AIAA Paper 71-1064.

PATENTS

1596. Dimeff, J.; and Harrison, D. R.  
Diode Quad Transducer and Discriminator Circuit. Dec. 20, 1971.  
US-PATENT-APPL-SN-209618
1597. Dimeff, J.  
Nondispersive Gas Analyzing Method and Apparatus Wherein Radiation is  
Serially Passed Through a Reference and Unknown Gas. July 25, 1972.  
US-PATENT-3,679,899
1598. Dimeff, J.; and Lane, J. W.  
Wide Range Dynamic Pressure Sensor. Nov. 16, 1971  
US-PATENT-3,620,083

23

COMPUTATION DIVISION

FORMAL REPORTS

1599. Card, D. H.; and Aoyagi, M.  
Block Up and Down Design for Estimating Sensory Thresholds. Oct. 1971.  
NASA TM-X-62090 N71-37644
1600. Stone, H. S.  
An Efficient Parallel Algorithm for the Solution of a Tridiagonal  
Linear System of Equations. Dec. 1971.  
NASA TM-X-62103 N72-17137

NASA CONTRACTOR REPORTS

1601. Anon.  
APT Comparative Study. (Symbolic Control, Inc., Palo Alto, Calif.;  
NAS2-6313.) 1971.  
NASA CR-114360 N71-34186

JOURNAL ARTICLES, MEETING PAPERS, BOOKS AND CHAPTERS OF BOOKS

1602. Rasmussen, D. N.; Hart, J. P.; and Glusovich, B. C.  
A Basic System for the Management of Experimental Data. In Conference  
on Engineering in Medicine and Biology, 24th Annual, Las Vegas, Oct.  
31-Nov. 4, 1971. Proceedings. p. 22.
1603. Rasmussen, D. N.; and Hart, J. P.  
A Command System for Interactive Analysis of Cardiovascular Experiments.  
In Conference on Engineering in Medicine and Biology, 24th Annual,  
Las Vegas, Oct. 31-Nov. 4, 1971. Proceedings. p. 149.

INSTITUTE FOR ADVANCED COMPUTATION

NASA CONTRACTOR REPORTS

1604. Anon.  
ILLIAC 4 Systems Characteristics and Programming Manual. Feb. 1973.  
NASA CR-2159 N73-19225

RESEARCH FACILITIES AND INSTRUMENTATION DIVISION

FORMAL REPORTS

1605. Grant, G. R.; and Orloff, K. L.  
A Two Color, Dual Beam Backscattering Laser Doppler Velocimeter.  
Mar. 1973.  
NASA TM-X-62254  
N73-21393
1606. Krutz, R. W., Jr.; Rositano, S. A.; and Mancini, R. E.  
Correlation of Eye-Level Blood Flow Velocity and Blood Pressure During  
+G<sub>z</sub> acceleration. Final Report, Jul. 1972-June 1973. Nov. 1973.  
AD-770560; SAM-TR-73-36  
N74-16833
1607. Mobley, R. E.; and Cameron, R. M.  
NASA-ARC 36 Inch Airborne Infrared Telescope. June 1972. In Aerospace  
Mechanisms Symposium, 6th, Ames Research Center, Moffett Field, Calif.,  
Sept. 9-11, 1971. Hertzl, G. G., Editor. 1972. p. 81-88.  
NASA TM-X-2557  
N72-26389
1608. Russell, L. D.  
PVF Pyroelectric Radiometer. May 1973.  
NASA TM-X-62271  
N73-25472

NASA CONTRACTOR REPORTS

1609. Anon.  
A Research on Integrated-Circuit Sensors for Gas Chromatography. Final  
Report. (Stanford Univ., Calif.; NAS2-6491.) Nov. 22, 1971.  
NASA CR-114394  
N72-13225
1610. Hinson, W. G.  
An Optical Interferometric System with a Linear Electronic Display of  
Periodic and Aperiodic Mechanical Displacement. (Arkansas Univ., Little  
Rock; NGL-04-001-007.) Sept. 9, 1971.  
NASA CR-114375  
N71-38286
1611. Larsen, H. J., Jr.  
Study and Evaluation of Ferro-Cement for Use in Wind Tunnel Construction.  
(JABE-ARC-07, Blume (John A.) and Associates Research Div., San  
Francisco, Calif.; NAS2-5889.) July 1972.  
NASA CR-114501  
N72-33916
1612. Mazumder, M. K.  
A Symmetrical Laser Doppler Velocity Meter and Its Application to  
Turbulence Characterization. May 1972.  
NASA CR-2031  
N72-24479

1613. Nurick, W. H.  
Study of Spray Disintegration in Accelerating Flow Fields. (R-9017,  
North American Rockwell Corp., Downey, Calif.; NAS2-6494.) June 1972.  
NASA CR-114479 N72-30959

JOURNAL ARTICLES, MEETING PAPERS, BOOKS AND CHAPTERS OF BOOKS

1614. Anderson, L. A.  
Effect of Surface Catalytic Activity on Stagnation Heat-Transfer Rates.  
AIAA Journal, vol. 11, May 1973, p. 649-656.
1615. Deboo, G. J.; and Burrous, C. N.  
Integrated Circuits and Semiconductor Devices; Theory and Application.  
New York, McGraw-Hill Book Co., 1971.
1616. Freund, W. R.; Fryer, T. B.; and Sandler, H.  
A Miniature Multi-Channel Telemetry System for Physiological Monitoring.  
In Conference on Engineering in Medicine and Biology, 26th Annual,  
Minneapolis, Sept. 30-Oct. 4, 1973. Proceedings. Washington,  
Alliance for Engineering in Medicine and Biology, 1973. p. 7.
1617. Fryer, T. B.; and Sandler, H.  
Miniature Battery-Operated Electromagnetic Flowmeter. Journal of  
Applied Physiology, vol 31, Oct. 1971, p. 622-628.
1618. Fryer, T. B.; Sandler, H.; and Doane, D. H.  
A Multichannel Electromagnetic Flowmeter Telemetry System. In  
Biotelemetry; Proceedings of the International Symposium, Nijmegen, the  
Netherlands, May 5-8, 1971. Kemmich, H. P.: and Vos, J. A., Editors.  
Leiden, Meander, 1972. p. 73-82.
1619. Grant, G. R.; and Orloff, K. L.  
Two-Color Dual-Beam Backscatter Laser Doppler Velocimeter. Applied  
Optics, vol. 12, Dec. 1973, p. 2913-2916.
1620. Harrison, D. R.; and Dimeff, J.  
A Diode-Quad Bridge Circuit for Use with Capacitance Transducers.  
Review of Scientific Instruments, vol. 44, Oct. 1973, p. 1468-1472.
1621. King, R. F.  
A Flight Simulator for Advanced Aircraft - Servo Design to Realization.  
In Summer Computer Simulation Conference, Montreal, Canada, July 17-  
19, 1973. Proceedings. La Jolla, Calif., Society for Computer  
Simulation, Inc., 1973. Vol. 1. p. 248-253.
1622. Krutz, R. W., Jr.; Rositano, S. A.; and Mancini, R. E.  
Physiological Assessment of the Transcutaneous Doppler Ultrasonic Flow-  
meter During  $+G_z$  Acceleration. In Aerospace Medical Association. Annual  
Scientific Meeting, Las Vegas, May 7-10, 1973. Preprints of Scientific  
Program. p. 77-78.

1623. Mancini, R. E.; Rositano, S. A.; Luzzi, E. P.; and Sandler, H.  
Doppler Ultrasonic Blood Flow Systems for Chronic Animal and Human  
Use. In Conference on Engineering in Medicine and Biology, 26th  
Annual, Minneapolis, Sept. 30-Oct. 4, 1973. Proceedings. p. 81.
1624. Orloff, K. L.; and Grant, G. R.  
The Application of a Scanning Laser Doppler Velocimeter to Trailing  
Vortex Definition and Alleviation. American Institute of Aeronautics  
and Astronautics. Fluid and Plasma Dynamics Conference, 6th, Palm  
Springs, Calif., July 16-18, 1973. AIAA Paper 73-680.
1625. Radosevich, R.; and Hayes, R. L.  
Toward the Implementation of R&D Resource Allocation Models. IEEE  
Transactions on Engineering Management, vol. EM-20, Feb. 1973, p. 32-  
33.
1626. Regent, B.  
Spinoffs Are Not Enough. Astronautics and Aeronautics, vol. 10, May  
1972, p. 66-71.
1627. Rositano, S. A.  
Flexible Electrodes - for the Patient's Sake. International Conference  
on Bio Electrode Technology, Stanford University, Oct. 1st, 1973.  
p. 81-93.
1628. Rositano, S. A.; Luzzi, E. P.; Mancini, R. E.; and Sandler, H.  
A Multichannel Directional Doppler Flowmeter. In Conference on  
Engineering in Medicine and Biology, 26th Annual, Minneapolis, Sept.  
30-Oct. 4, 1973. Proceedings. Washington, Alliance for Engineering  
in Medicine and Biology, 1973. p. 83.
1629. Rositano, S. A.; Mancini, R. E.; Krutz, R. W., Jr.; and Sandler, H.  
Non-Invasive Determination of Retrograde Eye Level Blood Flow as a  
 $+G_z$  Tolerance Indicator. In Aerospace Medical Association. Annual  
Scientific Meeting, Las Vegas, May 7-10, 1973. Preprints of the  
Scientific Program. p. 75-76.
1630. Rositano, S. A.; Sandler, H.; Pelligra, R.; Skrettingland, K.; and  
Mancini, R. E.  
Non-Invasive Method for Determination of Human Tolerance to  $+G_z$   
Acceleration. In Conference on Engineering in Medicine and Biology,  
25th Annual, Bal Harbour, Fla, Oct. 1-5, 1972. Proceedings.  
Washington, Alliance for Engineering in Medicine and Biology. Vol.  
14, p. 440.
1631. Rositano, S. A.  
Soft Semi-Dry Electrodes for Sensing and Stimulation. In Conference  
on Engineering in Medicine and Biology, 26th Annual, Minneapolis,  
Minn., Sept. 30-Oct. 4, 1973. Washington, Alliance for Engineering  
in Medicine and Biology, 1973. p. 12.



1632. Shaw, S. A.; Grant, G. R.; and Gunter, W. D., Jr.  
Optical Enhancement of Photomultipliers at Ultraviolet Wavelengths.  
Applied Optics, vol. 10, Nov. 1971, p. 2559.
1633. Westbrook, R. M.; Fryer, T. B.; and Sandler, H.  
Implantable Telemetry Systems Powered from Radioactive Batteries. In  
Conference on Engineering in Medicine and Biology. 26th Annual,  
Minneapolis, Sept. 30-Oct. 4, 1973. Proceedings. Washington, Alliance  
for Engineering in Medicine and Biology, 1973. p. 355.
1634. Westbrook, R.; Williams, B.; and Sandler, H.  
Long Term Use of a Swallowable Temperature Transmitter. In Aerospace  
Medical Association. Annual Scientific Meeting, Las Vegas, May 7-10,  
1973. Preprints of the Scientific Program. p. 127-128.
1635. Westbrook, R. M.; and Fryer, T. B.  
A Narrowband, Crystal Controlled Biomedical Telemetry System. In  
International Telemetry Conference, Los Angeles, October 10-12,  
1972. Proceedings. Woodland Hills, Calif., International Foundation  
for Telemetry, 1972. p. 214-220.
1636. Westbrook, R. M.; Fryer, T. B.; Evans, J. W.; and Winget, C. M.  
Telemetered Heart Rate and Temperature (Equine). Journal of Animal  
Science, vol. 33, 1971, p. 271.
1637. Wildenthal, K.; Harrison, D. R.; Templeton, G. H.; and Reardon, W. C.  
Method for Measuring the Contractions of Small Hearts in Organ Culture.  
Cardiovascular Research, vol. 7, Jan. 1973, p. 139-144.

#### PATENTS

1638. Beam, B. H.; and Russell, L. D.  
Thermodielectric Radiometer Utilizing Polymer Film. Apr. 18, 1972.  
US-PATENT-3,657,644
1639. Coon, G. W.  
Thermally Cycled Magnetometer Patent. Feb. 16, 1971.  
US-PATENT-3,564,401
1640. Deboo, G. J.  
Phase Shift Circuit Apparatus. Oct. 19, 1971.  
US-PATENT-3,614,475
1641. Deboo, G. J.; and Hedlund, R. C.  
Precision Rectifier with FET Switching Means Patent. June 28, 1971.  
US-PATENT-3,588,671

1642. Deboo, G. J.; and Hedlund R. C.  
Self-Tuning Bandpass Filter. Jan. 30, 1973.  
US-PATENT-3,714,588
1643. Fryer, T. B.  
Low Power Electromagnetic Flowmeter Providing Accurate Zero Set. Nov.  
12, 1971.  
US-PATENT-3,751,980
1644. Fryer, T. B.  
RF Controlled Solid State Switch. Nov. 16, 1971.  
US-PATENT-3,621,290
1645. Garavaglia, A. P.; and Matsuhiro, D. S.  
Shoulder Harness and Lap Belt Restraint System. Aug. 22, 1972.  
US-PATENT-APPL-SN-282738
1646. Gunter, W. D., Jr.; and Brown, R. M.  
Multiple Pass Reimaging Optical System. Feb. 6, 1973.  
US-PATENT-3,715,152
1647. Hadland, W. O.  
Two Degree Inverted Flexure. Oct. 24, 1972.  
US-PATENT-3,700,291
1648. Lee, R. D.  
Intruder Detection System. Mar. 6, 1973.  
US-PATENT-3,719,891
1649. Lee, R. D.; Hudock, R. J.; and Shute, D. I.  
Reference Apparatus for Medical Ultrasonic Transducer. Dec. 21, 1973.  
US-PATENT-APPL-SN-427395
1650. Lee, R. D.  
Telemetry Actuated Switch. Sept. 7, 1971.  
US-PATENT-3,603,946
1651. Rositano, S. A.  
Ultra-Flexible Biomedical Electrode and Wires. July 13, 1973.  
US-PATENT-APPL-SN-379018
1652. Rositano, S. A.  
Ultra-Flexible Biomedical Electrodes and Wires. July 3, 1973.  
US-PATENT-APPL-SN-379048
1653. Russell, L. D.  
High Intensity Radiant Energy Pulse Source Having Means for Opening  
Shutter When Light Flux Has Reached a Desired Level. Sept. 7, 1971.  
US-PATENT-3,603,798

SYSTEMS STUDIES DIVISION

FORMAL REPORTS

1654. Alexander, A. D., III  
Economic Study of Future Aircraft Fuels (1970-2000). Sept. 1972.  
NASA TM-X-62180 N72-32742
1655. Anon.  
Advanced Concepts and Missions Division Publications, 1971. Dec. 1971.  
NASA TM-X-62105 N72-17971
1656. Ardema, M. D.  
Approximations in the Minimum Time-to-Climb Problem. Aug. 1973.  
NASA TM-X-62292 N74-11820
1657. Ardema, M. D.  
Singular Perturbations in the State Regulator Problem. Apr. 1972.  
NASA TM-X-62146 N72-23197
1658. Ardema, M. D.  
Structural Weight Analysis of Hypersonic Aircraft. Mar. 1972.  
NASA TN-D-6692 N72-18911
1659. Ardema, M. D.; and Williams, L. J.  
Transonic Transport Study: Structures and Aerodynamics. June 1972.  
NASA TM-X-62157 N72-26016
1660. Arno, R. D.; MacKay, J. S.; and Nishioka, K.  
Applications Analysis of High Energy Lasers. Mar. 1972.  
NASA TM-X-62142 N72-22517
1661. Arno, R. D.; and Deerwester, J. M.  
Some Considerations in the Selection of Aircraft for Earth Resource  
Observations. Oct. 1971.  
NASA TM-X-2418 N71-37928
1662. Berkstresser, B. K.  
Trends in Transport Aircraft Avionics. Dec. 1973.  
NASA TM-X-62322 N74-12715
1663. Bowles, J. V.; and Galloway, T. L.  
Computer Programs for Estimating Aircraft Takeoff and Landing Perfor-  
mance. July 1973.  
NASA TM-X-62333 N74-16720
1664. Chacko, G. K.  
Reducing the Cost of Space Transportation, Volume 21. 1972.  
NASA TM-X-68548 N72-74126

1665. Dugan, D. W.  
Comparative Performance of Nuclear and Cryogenic Chemical Space  
Propulsion Systems. Aug. 1971.  
NASA TM-X-2352  
N71-31246
1666. Evans, L. C.  
The Remote Sensing of Saturn's Rings. I: The Magnetic Alinement of  
the Ring Particles. Nov. 1973.  
NASA TN-D-7475  
N74-10786
1667. Galloway, T. L.  
Future Short-Field Aircraft. In NASA. Ames Research Center, Moffett  
Field, Calif. STOL Technology; Conference Held at Moffett Field,  
Oct. 17-19, 1972. 1972. p. 9-22.  
NASA SP-320  
N73-32936
1668. Havill, C. D.; and Williams, L. J.  
Study of Buoyancy Systems for Flight Vehicles. Dec. 1972.  
NASA TM-X-62168  
N73-17014
1669. Kenyon, G. C.; Galloway, T. L.; and Drake, H. M.  
An Economic Analysis of Future Short-Haul Transportation. Mar. 1971.  
NASA TM-X-2228  
N71-20114
1670. MacKay, J. S.  
An Evaluation of Some Special Techniques for Nuclear Waste Disposal in  
Space. Aug. 1971.  
NASA TM-X-62272  
N73-27943
1671. MacKay, J. S.; Edsinger, L. E.; Evans, L. C.; Manning, L. A.; Sinclair,  
K. F.; and Swenson, B. L.  
A Preliminary Analysis of a Radar-Mapping Mission to Venus. Sept. 1973.  
NASA TM-X-2868  
N73-31728
1672. Manning, L. A.  
Summary of Saturn Swingby Missions to Uranus. Sept. 1973.  
NASA TM-X-2914  
N73-31727
1673. Nishioka, K.; Arno, R. D.; Alexander, A. D.; and Slye, R. E.  
Feasibility of Mining Lunar Resources for Earth Use: Circa 2000 AD.  
Vol. I. Summary. Aug. 1973.  
NASA TM-X-62267  
N73-30798
1674. Nishioka, K.; Arno, R. D.; Alexander, A. D.; and Slye, R. E.  
Feasibility of Mining Lunar Resources for Earth Use: Circa 2000 AD.  
Vol. II. Technical Discussion. Aug. 1973.  
NASA TM-X-62268  
N73-30799

1675. Petersen, R. H.; and Waters, M. H.  
Hypersonic Transports: Economics and Environmental Effects. Oct. 1972.  
NASA TM-X-62193 N72-33025
1676. Sinclair, K. F.  
Estimating Optical Imaging System Performance for Space Applications.  
Feb. 1972.  
NASA TM-X-62139 N72-18455
1677. Sinclair, K. F.  
Spin Scan Imaging at Jupiter. Apr. 1973.  
NASA TM-X-62260 N73-24836
1678. Smith, C. L.; and Wilcox, D. E.  
Transonic Transport Study: Economics. May 1972.  
NASA TM-X-62159 N72-27015
1679. Swenson, B. L.; Tindle, E. L.; and Manning, L. A.  
Mission Planning for Pioneer Saturn/Uranus Atmospheric Probe Missions.  
Sept. 1973.  
NASA TM-X-2824 N73-30800
1680. Swenson, B. L.; Edsinger, L. E.; Manning, L. A.; Norman, S. M.;  
Sinclair, K. F.; Stratton, A. J.; and Tindle, E. L.  
Preliminary Analysis of an Atmosphere-Entry Probe Mission to Jupiter.  
July 1971.  
NASA TM-X-2338 N71-36166  
(Also published as AAS Preprint 71-142, 1971)
1681. Swenson, B. L.; Tindle, E. L.; and Manning, L. A.  
Preliminary Mission Designs for Jupiter Orbiter Missions. May 1972.  
NASA TM-X-2565 N72-23898
1682. Swenson, B. L.  
Spacecraft Component Survivability During Entry into the Jovian  
Atmosphere. Apr. 1971.  
NASA TM-X-2276 N71-23824
1683. Tindle, E. L.  
Separation and Communications Geometry Analysis for a Jupiter Entry  
Probe from a Pioneer Spacecraft. Sept. 1972.  
NASA TM-X-62181 N72-31885
1684. VanVleck, E. M.; Sinclair, K. F.; Pitts, S. W.; and Slye, R. E.  
Earth Resources Ground Data Handling Systems for the 1980's. Mar. 1973.  
NASA TM-X-62240 N73-23472
1685. VanVleck, E. M.  
Information Transfer Satellite. Summary Report. July 1972.  
NASA TM-X-62190 N72-33865

1686. VanVleck, E. M.; Deerwester, J. M.; Norman, S. M.; and Alton, L. R.  
Space Program Payload Costs and Their Possible Reduction. Jan. 1973.  
NASA TM-X-62223 N73-16835
1687. Williams, L. J.  
Transonic Transport Study, Summary. May 1972.  
NASA TM-X-62156 N72-26009

#### NASA CONTRACTOR REPORTS

1688. Anderson, J. E.; and Fester, D. A.  
A Feasibility Study of Developing Toroidal Tanks for a Spinning Space-  
craft. Final Report. (MCR-73-223, Martin Marietta Corp., Denver, Colo.;  
NAS2-7489.) Sept. 1973.  
NASA CR-114666 N73-31766
1689. Androsky, A.; Miller, S. C.; Neiss, J. A.; Portenier, W. J.; and Webb,  
H. M.  
Study of V/STOL Aircraft Implementation. Vol. 2. Appendices. (ART-  
73(7303)-1-VOL-2-APP, Aerospace Corp., El Segundo, Calif.; NAS2-6473.)  
Nov. 1972.  
NASA CR-114518 N73-16009
1690. Anon.  
Guidance and Navigation Requirements for Unmanned Flyby and Swingby  
Missions to the Outer Planets. Vol. I. Summary Report. (R-678-VOL-1,  
Massachusetts Inst. of Tech., Cambridge; NAS2-5043.) Oct. 1971.  
NASA CR-114395 N72-14669
1691. Anon.  
Guidance and Navigation Requirements for Unmanned Flyby and Swingby  
Missions to the Outer Planets. Vol. IV. High Thrust Mission, Part 2,  
Phase C. Final Technical Report. (R-678-VOL-4-PT-2, Massachusetts  
Inst. of Tech., Cambridge; NAS2-5043.) Oct. 1971.  
NASA CR-114398 N72-14672
1692. Anon.  
Methodologies for Optimal Resource Allocation to the National Space  
Program and New Space Utilizations. Vol. 1. Technical Description.  
Final Report. (Lockheed Missiles and Space Co., Sunnyvale, Calif.;  
NAS2-5202.) Nov. 19, 1971.  
NASA CR-114380 N72-12963
1693. Anon.  
Methodologies for Optimal Resource Allocation to the National Space  
Program and New Space Utilizations. Vol. 2. Programmer's Manual.  
Resource Allocation and Smoothing Model. Final Report. (Lockheed  
Missiles and Space Co., Sunnyvale, Calif.; NAS2-5202.) Nov. 19, 1971.  
NASA CR-114381 N72-12964

1694. Anon.  
Study of a Common Solar-Electric-Propulsion Upper Stage for High-Energy Unmanned Missions. Vol. 1. Summary, Final Report. (TRW-16552-6006-R0-00-VOL-1, TRW Systems Group, Redondo Beach, Calif.; NAS2-6040.) July 14, 1971.  
NASA CR-114349 N71-32485
1695. Anon.  
Study of a Common Solar-Electric-Propulsion Upper Stage for High-Energy Unmanned Missions. Vol. 2. Technical, Final Report. (TRW-16552-6007-R0-00-VOL-2, TRW Systems Group, Redondo Beach, Calif.; NAS2-6040.) July 14, 1971.  
NASA CR-114350 N71-32486
1696. Anon.  
Study of a Common Solar-Electric-Propulsion Upper Stage for High-Energy Unmanned Missions. Vol. 3. Appendixes, Final Report. (TRW-16552-6008-R0-00-VOL-3, TRW Systems Group, Redondo Beach, Calif.; NAS2-6040.) July 14, 1971.  
NASA CR-114351 N71-32487
1697. Anon.  
Study of Aircraft in Intraurban Transportation Systems, San Francisco Bay Area. Mar. 1972.  
NASA CR-2006 N72-19021  
(Also published as NASA CR-114347)
1698. Anon.  
A Study of an Orbital Radar Mapping Mission to Venus. Vol. I. Summary. Final Report. (Martin Marietta Corp., Denver, Colo.; NAS2-7204.) Sept. 1973.  
NASA CR-114640 N73-31735
1699. Anon.  
A Study of an Orbital Radar Mapping Mission to Venus. Vol. II. Configuration Comparisons and Systems Evaluation. Final Report. (Martin Marietta Corp., Denver, Colo.; NAS2-7204.) Sept. 1973.  
NASA CR-114641 N73-31736
1700. Anon.  
A Study of an Orbital Radar Mapping Mission to Venus. Vol. III. Parametric Studies and Subsystem Comparisons. Final Report. (Martin Marietta Corp., Denver, Colo.; NAS2-7204.) Sept. 1973.  
NASA CR-114642 N73-31737
1701. Anon.  
Study of Quiet Turbofan STOL Aircraft for Short-Haul Transportation. Vol. II. Aircraft. Final Report. (MDC-J4371-VOL-2, Douglas Aircraft Co., Inc., Long Beach, Calif.; NAS2-6994.) June 1973.  
NASA CR-114607 N73-27899

1702. Anon.  
Study of Quiet Turbofan STOL Aircraft for Short-Haul Transportation.  
Vol. III. Airports. Final Report. (MDC-J4371-VOL-3, Douglas  
Aircraft Co., Inc., Long Beach, Calif.; NAS2-6994.) June 1973.  
NASA CR-114608 N73-27900
1703. Anon.  
Study of Quiet Turbofan STOL Aircraft for Short-Haul Transportation.  
Vol. IV. Markets. Final Report. (MDC-J4371-VOL-4, Douglas  
Aircraft Co., Inc., Long Beach, Calif.; NAS2-6994.) June 1973.  
NASA CR-114609 N73-27901
1704. Anon.  
Study of Quiet Turbofan STOL Aircraft for Short-Haul Transportation.  
Vol. V. Economics. Final Report. (MDC-J4371-VOL-5, Douglas Aircraft  
Co., Inc., Long Beach, Calif.; NAS2-6994.) June 1973.  
NASA CR-114610 N73-27902
1705. Anon.  
Study of Quiet Turbofan STOL Aircraft for Short-Haul Transportation.  
Vol. VI. Systems Analysis. Final Report. (MDC-J4371-VOL-6, Douglas  
Aircraft Co., Inc., Long Beach, Calif.; NAS2-6994.) June 1973.  
NASA CR-114611 N73-27903
1706. Backlund, S. J.; and Rossen, J. N.  
A Study of Performance and Cost Improvement Potential of the 120-Inch-  
(3.05 M) Diameter Solid Rocket Motor. Vol. 1. Summary Report. Final  
Report. (UTC-2401-FR-VOL-1, United Technology Center, Sunnyvale, Calif.;  
NAS2-6330.) Dec. 1971.  
NASA CR-114389 N72-14799
1707. Backlund, S. J.; and Rossen, J. N.  
A Study of Performance and Cost Improvement Potential of the 120-Inch-  
(3.05 M) Diameter Solid Rocket Motor. Vol. 2. Study Approach and  
Detailed Results. Final Report. (UTC-2401-FR-VOL-2, United Technology  
Center, Sunnyvale, Calif.; NAS2-6330.) Dec. 1971.  
NASA CR-114390 N72-14800
1708. Botticelli, R. A.; Johnson, R. O.; and Wallmark, G. N.  
The Applicability of Frame Imaging From a Spinning Spacecraft. Vol. 1.  
Summary Report. (CBS Labs., Stamford, Conn.; NAS2-7101.) June 30, 1973.  
NASA CR-114637 N74-17163
1709. Botticelli, R. A.; Johnson, R. O.; and Wallmark, G. N.  
The Applicability of Frame Imaging From a Spinning Spacecraft. Vol. 2.  
Technical Report. (CBS Labs., Stamford, Conn.; NAS2-7107.) June 30,  
1973.  
NASA CR-114638 N74-17164



1710. Bradshaw, G. B.; Homeyer, W. G.; Postula, F. D.; and Steeger, E. J.  
Study of Radioisotope Safety Devices for Electric Propulsion System.  
Vol. I. Summary Report. (GULF-GA-A-12242-VOL-1, Gulf General  
Atomic, San Diego, Calif.; NAS2-5891.) Oct. 6, 1972.  
NASA CR-114505 N73-10745
1711. Bradshaw, G. B.; Homeyer, W. G.; Postula, F. D.; and Steeger, E. J.  
Study of Radioisotope Safety Devices for Electric Propulsion System.  
Vol. II. Final Report. (GULF-GA-A-12242-VOL-2, Gulf General Atomic,  
San Diego, Calif.; NAS2-5891.) Oct. 6, 1972.  
NASA CR-114506 N73-10746
1712. Bradshaw, G. B.; Homeyer, W. G.; Postula, F. D.; and Steeger, E. J.  
Study of Radioisotope Safety Device for Electric Propulsion System.  
Vol. III. Briefing and Review of Work. (GULF-GA-A-12242-VOL-3, Gulf  
General Atomic, San Diego, Calif.; NAS2-5891.) Sept. 1972.  
NASA CR-114507 N73-10747
1713. Bruce, R. W.; and Webb, H. M.  
Systems Evaluation of Low Density Air Transportation Concepts. (ATR-  
73(9981)-1, Aerospace Corp., El Segundo, Calif.; NAS2-6473.) July 1972.  
NASA CR-114484 N73-32905
1714. Bursnall, W. J.  
Study of 1980 Comet Encke-Asteroid Missions Using a Spin-Stabilized  
Spacecraft. Vol. 1. Summary Report. (Martin Marietta Corp., Denver,  
Colo.; NAS2-7564.) Oct. 1973.  
NASA CR-114670 N74-12485
1715. Bursnall, W. J.; Howard, E. G.; McMinimy, W. R.; Shaffer, R. G.; and  
Van Pelt, J. M.  
Study of 1980 Comet Encke-Asteroid Missions Using a Spin-Stabilized  
Spacecraft. Vol. 2. Technical Report. (Martin Marietta Corp.,  
Denver, Colo.; NAS2-7564.) Oct. 1973.  
NASA CR-114671 N74-12486
1716. Burtt, J. E.; Moe, C. R.; Elms, R. V.; Delateur, L. A.; Sedlacek, W. C.;  
and Younger, G. G.  
Technology Requirements for Communication Satellites in the 1980's.  
Final Report. (Lockheed Missiles and Space Co., Sunnyvale, Calif.;  
NAS2-7073.) Oct. 1973.  
NASA CR-114680 N74-17567
1717. Burtt, J. E.; Moe, C. R.; Elms, R. V.; Delateur, L. A.; Sedlacek, W. C.;  
and Younger, G. G.  
Technology Requirements for Post-1985 Communications Satellites. Summary  
Report. (Lockheed Missiles and Space Co., Sunnyvale, Calif.; NAS2-  
7073.) Sept. 1973.  
NASA CR-114679 N74-16888

1718. Cook, W. S.; Hollenbeck, G. R.; Lewis, P. S.; Roos, D. G.; and Wainwright, D. E. Study of Ballistic Mode Mercury Orbiter Missions. Vol. 2. Technical Report. (Martin Marietta Corp., Denver, Colo.; NAS2-7268.) July 1973. NASA CR-114618 N73-31734
1719. Fan, S.; Horonjeff, R.; Kanafani, A.; and Mogharabi, A. Forecasting the Demand Potential for STOL Air Transportation. (California Univ., Berkeley; NAS2-6717.) Feb. 1973. NASA CR-114572 N73-22932
1720. Higgins, T. P.; Stout, E. G.; and Sweet, H. S. Study of Quiet Turbofan STOL Aircraft for Short Haul Transportation. Dec. 1973. NASA CR-2355 N74-11835
1721. Hollenbeck, G. R.; Roos, D. G.; and Lewis, P. S. Ballistic Mode Mercury Orbiter Mission Opportunity Handbook. Aug. 1973. NASA CR-2298 N73-32745
1722. Hollenbeck, G. R. Study of Ballistic Mode Mercury Orbiter Missions. Vol. 1. Summary Report. (Martin Marietta Corp., Denver, Colo.; NAS2-7268.) July 1973. NASA CR-114617 N73-31733
1723. Holligan, P. E.; Coote, M. A.; Rushmer, C. R.; and Fanning, M. L. Study of an Intraurban Travel Demand Model Incorporating Commuter Preference Variables. (D6-40556, Boeing Co., Seattle, Wash.; NAS2-5969.) Dec. 1971. NASA CR-114418 N72-22980
1724. Horsewood, J. L.; and Brice, K. B. Generation of NEP Heliocentric Trajectory Data. (AMA-72-43, Analytical Mechanics Associates, Inc., Seabrook, Md.; NAS2-6946.) Sept. 1972. NASA CR-114491 N73-10857
1725. Hurkamp, C. H.; Johnston, W. M.; and Wilson, J. H. Technology Assessment of Advanced General Aviation Aircraft. Summary Report. (Lockheed-Georgia Co., Marietta, Ga.; NAS2-5972.) 1971. NASA CR-114338 N71-35217
1726. Lu, J. Y.; Gebman, J. R.; Kirkwood, T. F.; McClure, P. T.; and Stucker, J. P. External Impacts of an Intraurban Air Transportation System in the San Francisco Bay Area. (Rand Corp., Santa Monica, Calif.; NAS2-6480.) Oct. 1973. NASA CR-114492 N73-12982

1727. Merrill, G. L.; Burnett, G. A.; and Alsworth, C. C.  
Study of Small Turbofan Engines Applicable to General-Aviation Aircraft.  
Final Report. (AIRE SEARCH-73-210148, Aire Search Mfg. Co., Phoenix,  
Ariz.; NAS2-6799.) Sept. 1973. N74-10725  
NASA CR-114630
1728. Pirrello, C. J.; Hardin, R. D.; Heckart, M. V.; and Brown, K. R.  
An Inventory of Aeronautical Ground Research Facilities. Vol. I.  
Wind Tunnels. Nov. 1971. N72-12182  
NASA CR-1874
1729. Pirrello, C. J.; Hardin, R. D.; Heckart, M. V.; and Brown, K. R.  
An Inventory of Aeronautical Ground Research Facilities. Vol. II.  
Air Breathing Engine Test Facilities. Nov. 1971. N72-13233  
NASA CR-1875
1730. Pirrello, C. J.; Hardin, R. D.; Heckart, M. V.; and Brown, K. R.  
An Inventory of Aeronautical Ground Research Facilities. Vol. III.  
Structural. Nov. 1971. N72-12183  
NASA CR-1876
1731. Pirrello, C. J.; Hardin, R. D.; Capelluro, L. P.; and Harrison, W. D.  
An Inventory of Aeronautical Ground Research Facilities. Vol. IV.  
Engineering Flight Simulation Facilities. Nov. 1971. N72-14274  
NASA CR-1877
1732. Portenier, W. J.; and Webb, H. M.  
Study of V/STOL Aircraft Implementation. Vol. 1. Summary. Mar. 1973. N73-19017  
NASA CR-2227
1733. Renshaw, J. H.  
Quiet Turbofan STOL Aircraft for Short Haul Transportation. Vol. I.  
Final Report. (Lockheed-California Co., Burbank; NAS2-6995.) June 14,  
1973. N73-25065  
NASA CR-114612
1734. Renshaw, J. H.  
Quiet Turbofan STOL Aircraft for Short Haul Transportation. Vol. II.  
Final Report. (Lockheed-California Co., Burbank; NAS2-6995.) June 14,  
1973. N73-25066  
NASA CR-114613
1735. Shevell, R. S.; and Jones, D. W., Jr.  
Studies in Short Haul Air Transportation in the California Corridor:  
Effects of Design Runway Length; Community Acceptance; Impact of  
Return on Investment and Fuel Cost Increases. Vol. I. (SUDAAR-460-  
VOL-1, Stanford Univ., Calif.; NAS2-7199.) July 1973. N73-32842  
NASA CR-114634-VOL-1

1736. Shevell, R. S.; and Jones, D. W., Jr.  
 Studies in Short Haul Air Transportation in the California Corridor:  
 Effects of Design Runway Length; Community Acceptance; Impact of  
 Return on Investment and Fuel Cost Increases. Vol. II. Appendices.  
 (SUDAAR-460-VOL-2-APP, Stanford Univ., Calif.; NAS2-7199.) July 1973.  
 NASA CR-114634-VOL-2 N73-32843
1737. Stout, E. G.  
 Study of Aircraft in Intraurban Transportation Systems. Mar. 1972.  
 NASA CR-1991 N72-26024
1738. Worobel, R.; and Mayo, M. G.  
 Advanced General Aviation Propeller Study. (Hamilton Standard, Windsor  
 Locks, Conn.; NAS2-6477.) Dec. 21, 1971.  
 NASA CR-114399 N72-18004
1739. Worobel, R.  
 Computer Program User's Manual for Advanced General Aviation Propeller  
 Study. May 1972.  
 NASA CR-2066 N72-25005
1740. Worobel, R.; and Mayo, M. G.  
 Q-FANS<sup>TM</sup> for General Aviation Aircraft. (Hamilton Standard, Windsor  
 Locks, Conn.; NAS2-6834.) Dec. 1973.  
 NASA CR-114665 N74-13726

JOURNAL ARTICLES, MEETING PAPERS, BOOKS AND CHAPTERS OF BOOKS

1741. Alexander, A. D., III  
 Impacts of Telemation on Modern Society. In Symposium on Theory and  
 Practice of Robots and Manipulators, 1st, Udine, Italy, International  
 Centre for Mechanical Sciences, 1973.  
 (Also published in Human Factors Society, Annual Meeting, 17th,  
 Washington, D. C., Oct. 16-18, 1973. Proceedings. p. 299-304)
1742. Alexander, A. D., III  
 A Survey Study of Teleoperators, Robotics, and Remote Systems  
 Technology. In Remotely Manned Systems: Exploration and Operation in  
 Space; Proceedings of the 1st National Conference, Pasadena, Calif.,  
 Sept. 13-15, 1972. Heer, E., Editor. Pasadena, Calif., California  
 Institute of Technology, 1973. p. 449-458.
1743. Ardema, M. D.; and Williams, L. J.  
 Automated Synthesis of Transonic Transports. American Institute of  
 Aeronautics and Astronautics. Aircraft Design, Flight Test, and  
 Operations Meeting, 4th, Los Angeles, Calif., Aug. 7-9, 1972. AIAA  
 Paper 72-794.

1744. Ardema, M. D.; and Waters, M. H.  
 Long Range View of Materials Research for Civil Transport Aircraft.  
In Materials and Processes for the 70's - Cost Effectiveness and Reliability; Proceedings of the National SAMPE Technical Conference, 5th, Kiamesha Lake, N. Y., Oct. 9-11, 1973. Azusa, Calif., Society for the Advancement of Material and Process Engineering, 1973. p. 356-370.
1745. Ardema, M. D.  
 Minimum Weight Passive Insulation Requirements for Hypersonic Cruise Vehicles. AIAA Journal, vol. 10, July 1972, p. 968-970.
1746. Arno, R. D.; MacKay, J. S.; and Nishioka, K.  
 Laser Energy Transfer - An Analytic Survey of High Power Applications.  
In Intersociety Energy Conversion Engineering Conference, 7th, San Diego, Calif., Sept. 25-29, 1972. Proceedings. Washington, D. C., American Chemical Society, 1972. p. 1116-1124.
1747. Evans, L. C.; and Stone, E. C.  
 Electron Polar Cap and the Boundary of Open Geomagnetic Field Lines. Journal of Geophysical Research, vol. 77, Oct. 1, 1972, p. 5580-5584.
1748. Galloway, T. L.; and Waters, M. H.  
 Computer Aided Parametric Analysis for General Aviation Aircraft. In Society of Automotive Engineers. Business Aircraft Meeting, Wichita, Kan., Apr. 3-6, 1973. SAE Paper 730332.
1749. MacKay, J. S.; and Mascy, A. C.  
 Some Three-Body Numerical Solutions for Low-Thrust Orbiter Missions. Journal of Spacecraft and Rockets, vol. 8, Nov. 1971, p. 1143-1147.
1750. Manning, L. A.  
 Utilization of Jupiter Swingby Trajectories for Comet Exploration. Journal of Spacecraft and Rockets, vol. 8, Nov. 1971, p. 1152-1157.
1751. Meissinger, H. F.; Goldin, D. S.; and Mascy, A. C.  
 A Common Solar Electric Upper Stage for Multi-Mission Applications. American Institute of Aeronautics and Astronautics. Electric Propulsion Conference, 9th, Bethesda, Md., Apr. 17-19, 1972. AIAA Paper 72-464.
1752. Mondt, J. F.; Sawyer, C. D.; and Schaupp, R. W.  
 Thermionic Reactor Electric Propulsion System Requirements. In International Atomic Energy Agency and European Nuclear Energy Agency. International Conference on Thermionic Electrical Power Generation, 3rd, Juelich, West Germany, June 5-9, 1972. Paper.

1753. Nishioka, K.; Munch, N. E.; Bradshaw, R. B.; and Mangrum, E.  
Aerospace Launch Vehicle Program Factors, Structures and Advanced  
Materials Cost-Performance Tradeoffs. Society of Aeronautical Weight  
Engineers. Annual Conference, 30th, Newport Beach, Calif., May 3-5,  
1971. SAWE Paper 884.
1754. Norman, S. D.  
Some Considerations for Air Transportation Analysis to Non-Urban Areas.  
Intersociety Conference on Transportation, 2nd, Denver, Colo., Sept.  
23-27, 1973. ASME Paper 73-ICT-72.
1755. Petersen, R. H.; and Waters, M. H.  
Hypersonic Transports - Economics and Environmental Effects. Journal  
of Aircraft, vol. 10, June 1973, p. 334-341.  
(Also published as ICAS Paper 72-32)
1756. Schaupp, R. W.; and Sawyer, C. D.  
Applications of Nuclear Reactor Power Systems to Electric Propulsion  
Missions. In Thermionic Conversion Specialist Conference, 10th,  
San Diego, Calif., Oct. 4-6, 1971. Conference Record. New York,  
Institute of Electrical and Electronics Engineers, Inc., 1971.  
p. 1-12.
1757. Schaupp, R. W.; and Sawyer, C. D.  
Propulsion System Requirements for a Multi-Mission Nuclear Electric  
Spacecraft. American Institute of Aeronautics and Astronautics.  
Electric Propulsion Conference, 9th, Bethesda, Md., Apr. 17-19, 1972.  
AIAA Paper 72-503.
1758. Waters, M. H.; Galloway, T. L.; Rohrbach, C.; and Mayo, M. G.  
Shrouded Fan Propulsors for Light Aircraft. Society of Automotive  
Engineers. Business Aircraft Meeting, Wichita, Kan., Apr. 3-6, 1973.  
SAE Paper 730323.

ARMY AIR MOBILITY RESEARCH AND DEVELOPMENT LABORATORY

FORMAL REPORTS

1759. Carlson, R. M.; and Kerr, A. W.  
Integrated Rotor/Body Loads Prediction. In Advisory Group for Aerospace Research and Development, Paris. Specialists Meeting on Helicopter Rotor Prediction Methods, Milan, 30-31 Mar. 1973.  
(AGARD-CP-122) N74-10916
1760. Gossett, T. D.; and Corliss, L. D.  
A Quadratic Performance Index for a VTOL Aircraft Prefilter Model Reference Attitude Control System. Mar. 1971.  
NASA TN-D-6231 N71-18836
1761. Hodges, D. H.  
Nonlinear Bending and Torsion of Rotating Beams with Application to Linear Stability of Hingeless Helicopter Rotors. Ph.D. Thesis, Stanford Univ., Calif., 1973.  
N74-12545
1762. Hodges, D. H.; and Ormiston, R. A.  
Nonlinear Equations for Bending of Rotating Beams with Application to Linear Flap-Lag Stability of Hingeless Rotors. May 1973.  
NASA TM-X-2770 N73-24897
1763. Johnson, W.  
A Pertinent Solution of Helicopter Rotor Flapping Stability. July 1972.  
NASA TM-X-62165 N73-14006
1764. Laub, G. H.; and Kodani, H. M.  
Wind Tunnel Investigation of Aerodynamic Characteristics of Scale Models of Three Rectangular Shaped Cargo Containers. July 1972.  
NASA TM-X-62169 N72-27995
1765. Martin, J. M.; and Ingram, C. W.  
An Experimental Correlation Between the Flow and Magnus Characteristics of a Spinning Ogive-Nose Cylinder. Ph.D. Thesis, Notre Dame Univ., 1973.  
N73-18286
1766. McCroskey, W. J.  
Dynamic Stall of Airfoils and Helicopter Rotors. In Advisory Group for Aerospace Research and Development, Paris. Structures and Materials Panel Meeting, 34th, Lyngby, Denmark, 11 Apr. 1972. Unsteady Aerodynamics of Helicopter Rotors. Oct. 1972.  
(AGARD-R-595) N73-14002

1767. McCroskey, W. J.  
Recent Developments in Rotor Blade Stall. In Advisory Group for Aero-  
space Research and Development, Paris. Aerodynamics of Rotary Wings,  
Marseilles, 13-15 Sept. 1972. Feb. 1973. N73-21046  
(AGARD-CP-111)
1768. Ormiston, R. A.  
An Actuator Disc Theory for Rotor Wake Induced Velocities. In  
Advisory Group for Aerospace Research and Development, Paris.  
Aerodynamics of Rotary Wings, Marseilles, 13-15 Sept. 1972. Feb. 1973.  
(AGARD-CP-111) N73-21033
1769. Ormiston, R. A.  
Experimental Investigation of Stability and Stall Flutter of a Free-  
Floating Wing V/STOL Model. June 1972. N72-25998  
NASA TN-D-6831
1770. Ormiston, R. A.  
Rotor Dynamic Considerations for Large Wind Power Generator Systems.  
In NASA. Lewis Research Center. Wind Energy Conversion Systems,  
Washington, 11-13 June, 1973. Savino, J. M., Editor. Dec. 1973.  
NASA TM-X-69786 N74-16772
1771. Ormiston, R. A.; and Bousman, W. G.  
A Theoretical and Experimental Investigation of Flap-Lag Stability  
of Hingeless Helicopter Rotor Blades. Aug. 1972. N72-30003  
NASA TM-X-62179  
(Also available as AD-750359)
1772. Peters, D. A.  
An Approximate Solution for the Free Vibrations of Rotating Uniform  
Cantilever Beams. Sept. 1973. N73-33885  
NASA TM-X-62299
1773. Rose, R. E.; Wynn, T. M.; Smith, G. A.; and Merrill, G. L.  
Feasibility Study of a Bidirectional Jet Flap Device for Application  
to Helicopter Rotor Blades. Phase 2. Lift Controller Development.  
Apr. 1972. N72-26010  
NASA TM-X-62152
1774. Singleton, R. E.; Nash, J. F.; Carl, L. W.; and Patel, V. C.  
Unsteady Turbulent Boundary Layer Analysis. Feb. 1973. N73-19297  
NASA TM-X-62242
1775. Vause, C. R.; and Schmitz, F. H.  
Near Optimal Takeoff Performance of a Heavily Loaded Helicopter in  
Ground Effect. N73-15066  
(Also available as AD-750388)



1776. Wu, J. C.; and Goorjian, P. M.  
Optimum Performance of Hovering Rotors. Mar. 1972.  
NASA TM-X-62138 N72-22019
1777. Yaggy, P. F.; and Statler, I. C.  
Progress in Rotor-Blade Aerodynamics. In Advisory Group for Aerospace  
Research and Development, Paris. Advanced Rotorcraft, 39th Meeting of  
the Flight Mechanics Panel of AGARD, Hampton, Va., 20-23 Sept. 1971.  
Vol. 1. p. 11-1 - 11-15.  
(AGARD-CP-121) N73-21019
1778. Yaggy, P. F.  
The Role of Aerodynamics and Dynamics in Military and Civilian  
Applications of Rotary Wing Aircraft. In Advisory Group for Aero-  
space Research and Development, Paris. Fluid Dynamics Panel.  
Helicopter Aerodynamics and Dynamics, Rhode-St. Genese, Belgium, 2-6  
Apr. 1973.  
(AGARD-LS-63) N73-22949

#### NASA CONTRACTOR REPORTS

1779. Bender, J.; and Arndt, R. E. A.  
Aeroacoustic Research in Wind Tunnels: A Status Report. (PSU-AERSP-  
73-1, Pennsylvania State Univ., University Park; NAS2-6312.) Feb. 1973.  
NASA CR-114575 N73-20277
1780. Bobo, C. J.  
Theory/Test Correlation of Helicopter Rotor Blade Element Airloads  
in the Blade Stall Regime. (D210-10508-1, Boeing Co., Philadelphia,  
Pa.; NAS2-5473.) Aug. 1972.  
NASA CR-114489 N73-13028
1781. Fisher, R. K., Jr.; Tompkins, J. E.; Bobo, C. J.; and Child, R. F.  
An Experimental Investigation of the Helicopter Rotor Blade Element  
Airloads on a Model Rotor in the Blade Stall Regime. (D210-10347-1,  
Boeing Co., Philadelphia, Pa.; NAS2-5473.) Sept. 1971.  
NASA CR-114424 N72-18005
1782. Friedmann, P.; and Tong, P.  
Dynamic Nonlinear Elastic Stability of Helicopter Rotor Blades in Hover  
and in Forward Flight. (ASRL-TR-166-3, Massachusetts Inst. of Tech.,  
Cambridge; NAS2-6175.) May 30, 1972.  
NASA CR-114485 N73-12043

1783. Friedmann, P.  
Investigation of Some Parameters Affecting the Stability of a Hingeless Helicopter Blade in Hover. (ASRL-TR-166-4, Massachusetts Inst. of Tech., Cambridge; NAS2-6175.) Aug. 1972.  
NASA CR-114525 N73-16015
1784. Hinterkeuser, E. G.  
Acoustical Properties of a Model Rotor in Nonaxial Flight. Final Report. (D210-10666-2, Boeing Vertol Co., Philadelphia, Pa.; NAS2-5473. Sept. 15, 1973.  
NASA CR-114749 N74-18678
1785. Hohenemser, K. H.; and Yin, S. K.  
Concepts for a Theoretical and Experimental Study of Lifting Rotor Random Loads and Vibrations. (Effects of Blade Torsion, of Blade Flap Bending Flexibility and of Rotor Support Flexibility on Rotor Stability and Random Response.) Phase 6-A. (Washington, Univ., St. Louis, Mo.; NAS2-4151.) June 1972.  
NASA CR-114480 N72-28018
1786. Hohenemser, K. H.; and Crews, S. T.  
Concepts for a Theoretical and Experimental Study of Lifting Rotor Random Loads and Vibrations. (Experiments with Progressing/Regressing Forced Rotor Flapping Modes.) Phase 6-B. (Washington Univ., St. Louis, Mo.; NAS2-4151.) June 1972.  
NASA CR-114481 N72-28019
1787. Hohenemser, K. H.; and Yin, S. K.  
Concepts for a Theoretical and Experimental Study of Lifting Rotor Random Loads and Vibrations. (The Effects of Some Rotor Feedback Systems on Rotor-Body Dynamics.) Phase 7-A. (Washington Univ., St. Louis, Mo.; NAS2-4151.) June 1973.  
NASA CR-114709 N74-14757
1788. Hohenemser, K. H.; and Prelewicz, D. A.  
Concepts for a Theoretical and Experimental Study of Lifting Rotor Random Loads and Vibrations. (Identification of Lifting Rotor System Parameters from Transient Response Data.) Phase 7-B. (Washington Univ., St. Louis, Mo.; NAS2-4151.) June 1973.  
NASA CR-114710 N74-14758
1789. Hohenemser; K. H.; and Crews, S. T.  
Concepts for a Theoretical and Experimental Study of Lifting Rotor Random Loads and Vibrations. (Further Experiments with Progressing/Regressing Rotor Flapping Modes.) Phase 7-C. (Washington Univ., St. Louis, Mo.; NAS2-4151.) June 1973.  
NASA CR-114711 N74-14759

1790. Kuczynski, W. A.; and Sissingh, G. J.  
 Characteristics of Hingeless Rotors with Hub Moment Feedback Controls  
 Including Experimental Rotor Frequency Response. Vol. 1. Final Report.  
 (LR-20548-VOL-1, Lockheed-California Co., Burbank; NAS2-5419.)  
 Jan. 1972.  
 NASA CR-114427 N72-18024
1791. Kuczynski, W. A.; and Sissingh, G. J.  
 Characteristics of Hingeless Rotors with Hub Moment Feedback Controls  
 Including Experimental Rotor Frequency Response. Vol. 2. Final  
 Report. (LR-25048-VOL-2, Lockheed-California Co., Burbank; NAS2-5419.)  
 Jan. 1972.  
 NASA CR-114428 N72-18025
1792. Kuczynski, W. A.  
 Experimental Hingeless Rotor Characteristics at Full Scale First Flap  
 Mode Frequencies (Including Rotor Frequency Response to Shaft  
 Oscillations). Phase 3. Final Report, Oct. 1971-Aug. 1972. (LR-  
 25491, Lockheed-California, Burbank; NAS2-5419.) Oct. 1972.  
 NASA CR-114519 N73-12032
1793. London, R. J.; Watts, G. A.; and Sissingh, G. J.  
 Experimental Hingeless Rotor Characteristics at Low Advance Ratio With  
 Thrust. (Lockheed-California Co., Burbank; NAS2-7245.) Dec. 1973.  
 NASA CR-114684 N74-16721
1794. Olsen, J. H.; and Liu, H. T.  
 The Construction and Operation of a Water Tunnel in Application to Flow  
 Visualization Studies of an Oscillating Airfoil. (REPT-13, Flow  
 Research, Inc.; NAS2-6927.) May 1973.  
 NASA CR-114696 N74-15946
1795. Robinson, F.  
 Component Noise Variables of a Light Observation Helicopter. (HH-73-  
 41, Hughes Helicopters, Culver City, Calif.; NAS2-7274.) 1973.  
 NASA CR-114761 N74-20662
1796. Rose, R. E.; Hammer, J. M.; Kizilos, A. P.  
 Feasibility Study of a Bidirectional Jet Flap Device for Application  
 to Helicopter Rotor Blades. Phase 1, Final Report, June 6, 1967 -  
 Oct. 3, 1969. (REPT-12081-FRI, Honeywell, Inc., St. Paul, Minn.; NAS2-  
 4389.) July 1971.  
 NASA CR-114359 N71-32385
1797. Schmitz, F. H.; Stepniewski, W. Z.; Gibs, J.; and Hinterkeuser, W. Z.  
 A Comparison of Optimal and Noise-Abatement Trajectories of a Tilt-  
 Rotor Aircraft. May 1972.  
 NASA CR-2034 N72-26025

1798. Tong, P.  
The Nonlinear Instability in Flap-Lag of Rotor Blades in Forward Flight. (ASRL-TR-166-2, Massachusetts Inst. of Tech., Cambridge; NAS2-6175.) Oct. 1971.  
NASA CR-114524 N73-17017
1799. Wagner, R. A.  
Noise Levels of Operational Helicopters of the OH-6 Type Designed to Meet the LOH Mission. (HH-74-28, Hughes Helicopters, Culver City, Calif.; NAS2-7254.) 1973.  
NASA CR-114760 N74-20663
1800. Watts, G. A.; and London, R. J.  
Vibration and Loads in Hingeless Rotors. Vol. I. Theoretical Analyses. (Lockheed-California Co., Van Nuys; NAS2-5168.) Sept. 1972.  
NASA CR-114562 N73-18034
1801. Watts, G. A.; and London, R. J.  
Vibration and Loads in Hingeless Rotors. Vol. II. Experimental Data. (Lockheed-California Co., Van Nuys; NAS2-5168.) Sept. 1972.  
NASA CR-114568 N73-18035

JOURNAL ARTICLES, MEETING PAPERS, BOOKS AND CHAPTERS OF BOOKS

1802. Blaser, D. A.; and Velkoff, H. R.  
A Preliminary Analytical and Experimental Investigation of Helicopter Rotor Boundary Layers. AIAA Journal, vol. 11, Dec. 1973, p. 1660-1665.
1803. Burke, J. A.; and Chevalier, H. L.  
Flight Evaluations of Steep Approach Landings to Reduce Pilot's Workload. American Institute of Aeronautics and Astronautics. Guidance, Control and Flight Mechanics Conference, Hofstra Univ., Hempstead, N. Y., Aug. 16-18, 1971. AIAA Paper 71-904.
1804. Chevalier, H.; and Burke, J. A.  
Evaluation of Pilot Workload and Handling Qualities Criteria for Light Airplanes During Steep Landing Approach. American Institute of Aeronautics and Astronautics. Aerospace Sciences Meeting, 10th, San Diego, Calif., Jan. 17-19, 1972. AIAA Paper 72-125.
1805. Chevalier, H.; and Burke, J. A.  
Handling Characteristics in Roll of Two Light Airplanes for Steep Approach Landings. Journal of Aircraft, vol. 9, Nov. 1972, p. 759-764.
1806. Crews, S. T.; Hohenemser, K. H.; and Ormiston, R. A.  
An Unsteady Wake Model for a Hingeless Rotor. Journal of Aircraft, vol. 10, Dec. 1973, p. 758-760.

1807. Dwyer, H. A.; and McCroskey, W. J.  
Computational Problems in Three and Four Dimensional Boundary Layer Theory. In International Conference on Numerical Methods in Fluid Mechanics, 3rd, Paris, France, July 3-7, 1972. Proceedings. Vol. 2. Problems of Fluid Dynamics. Berlin and New York, Springer-Verlag, 1973. p. 138-145.
1808. Dwyer, H. A.; and McCroskey, W. J.  
Crossflow and Unsteady Boundary-Layer Effects on Rotating Blades. AIAA Journal, vol. 9, Aug. 1971, p. 1498-1505.  
(Also published as AIAA Paper 70-50)
1809. Dwyer, H. A.; and McCroskey, W. J.  
Oscillating Flow Over a Cylinder at Large Reynolds Number. Journal of Fluid Mechanics, vol. 61, Dec. 18, 1973, p. 753-767.
1810. Fisher, R. K., Jr.; and McCroskey, W. J.  
Detailed Aerodynamic Measurements on a Model Rotor in the Blade Stall Regime. American Helicopter Society. Annual National V/STOL Forum, 27th, Washington, D. C., May 19-21, 1971. AHS Preprint 521.
1811. Hodges, D. H.; and Ormiston, R. A.  
Stability of Elastic Bending and Torsion of Uniform Cantilevered Rotor Blades in Hover. AIAA, ASME, and SAE. Structures, Structural Dynamics, and Materials Conference, 14th, Williamsburg, Va., Mar. 20-22, 1973. AIAA Paper 73-405.
1812. Isom, M. P.; and Caradonna, F. X.  
Subsonic and Transonic Potential Flow Over Helicopter Rotor Blades. American Institute of Aeronautics and Astronautics. Aerospace Sciences Meeting, 10th, San Diego, Calif., Jan. 17-19, 1972. AIAA Paper 72-39.
1813. Johnson, W.; and Scully, M. P.  
Aerodynamic Problems in the Calculation of Helicopter Airloads. In Status of Testing and Modeling Techniques for V/STOL Aircraft; Proceedings of the Mideast Region Symposium, Essington, Pa., Oct. 26-28, 1972. Philadelphia, Pa., Boeing Vertol Co., 1973.
1814. Johnson, W.; and Ham, N. D.  
On the Mechanism of Dynamic Stall. American Helicopter Society. Journal, vol. 17, Oct. 1972, p. 36-45.
1815. Johnson, W.  
A Perturbation Solution of Helicopter Rotor Flapping Stability. Journal of Aircraft, vol. 10, May 1973, p. 257-258.

1816. Kuczynski, W. A.; and Sharpe, D. L.  
Hingeless Rotor Characteristics at High Advance Ratios. American Institute of Aeronautics and Astronautics. Fluid and Plasma Dynamics Conference, 4th, Palo Alto, Calif., June 21-23, 1971. AIAA Paper 71-580.
1817. Kuczynski, W. A.; Sharpe, D. L.; and Sissingh, G. J.  
Hingeless Rotor - Experimental Frequency Response and Dynamic Characteristics with Hub Moment Feedback Controls. American Helicopter Society, Annual National Forum, 28th, Washington, D. C., May 17-19, 1972. AHS Preprint 612.
1818. Martin, J. M.; Empey, R. W.; McCroskey, W. J.; and Caradonna, F. X.  
A Detailed Experimental Analysis of Dynamic Stall on an Unsteady Two-Dimensional Airfoil. American Helicopter Society, Annual National Forum, 29th, Washington, D. C., May 9-11, 1973. AHS Preprint 702.
1819. McAlister, K. W.  
Laminar Free Convection on a Curved Wall. ASME. Transactions. Series E: Journal of Applied Mechanics, vol. 38, Dec. 1971, p. 1081-1083.
1820. McCroskey, W. J.; and Durbin, E. K.  
Flow Angle and Shear Stress Measurements Using Heated Films and Wires. In Fluid Dynamics Measurements. Presentations from Fluids Engineering Conference, Pittsburg, Pa., May 9-12, 1971 and American Society of Mechanical Engineers, Winter Annual Meeting, Washington, D. C., Nov. 28-Dec. 2, 1971. New York, American Society of Mechanical Engineers, 1971. ASME Paper 71-WA/FE-17.
1821. McCroskey, W. J.  
The Inviscid Flowfield of an Unsteady Airfoil. American Institute of Aeronautics and Astronautics. Fluid and Plasma Dynamics Conference, 5th, Boston, June 26-28, 1972. AIAA Paper 72-681.
1822. McCroskey, W. J.; Nash, J. F.; and Hicks, J. G.  
Turbulent Boundary-Layer Flow Over a Rotating Flat-Plate Blade. AIAA Journal, vol. 9, Jan. 1971, p. 188-189.
1823. Nash, J. F.; Carr, L. W.; and Singleton, R. E.  
Unsteady Turbulent Boundary Layers in Two-Dimensional, Incompressible Flow. American Institute of Aeronautics and Astronautics. Fluid and Plasma Dynamics Conference, 6th, Palm Springs, July 16-18, 1973. AIAA Paper 73-650.
1824. Ormiston, R. A.  
Helicopter Modelling. Aeronautical Journal, vol. 77, Nov. 1973, p. 579-591.

1825. Ormiston, R. A.; and Peters, D. A.  
Hingeless Rotor Response with Nonuniform Inflow and Elastic Blade Bending - Theory and Experiment. American Institute of Aeronautics and Astronautics. Aerospace Sciences Meeting, 10th, San Diego, Calif., Jan. 17-19, 1972. AIAA Paper 72-65.
1826. Ormiston, R. A.; and Hodges, D. H.  
Linear Flap-Lag Dynamics of Hingeless Helicopter Rotor Blades in Hover. American Helicopter Society. Journal, vol. 17, Apr. 1972, p. 2-14.
1827. Ormiston, R. A.; and Bousman, W. G.  
A Study of Stall-Induced Flap-Lag Instability of Hingeless Rotors. American Helicopter Society. Annual National Forum, 29th, Washington, D. C., May 9-11, 1973. AHS Preprint 730.
1828. Ormiston, R. A.  
Theoretical and Experimental Aerodynamics of the Sailwing. Journal of Aircraft, vol. 8, Feb. 1971, p. 77-84.
1829. Peters, D. A.; and Ormiston, R. A.  
The Effects of Second Order Blade Bending on the Angle of Attack of Hingeless Rotor Blades. American Helicopter Society. Journal, vol. 18, Oct. 1973, p. 45-48.
1830. Schmitz, F. H.; and Stepniewski, W. Z.  
The Reduction of VTOL Operational Noise Through Flight Trajectory Management. American Inst. of Aeronautics and Astronautics, Annual Meeting and Technical Display, 8th, Washington, D. C., Oct 25-28, 1971. AIAA Paper 71-991.
1831. Stepniewski, W. Z.; and Schmitz, F. H.  
Possibilities and Problems of Achieving Community Noise Acceptance of VTOL. Aeronautical Journal, vol. 77, June 1973, p. 311-326.  
(Also published as ICAS Paper 72-34)

#### PATENTS

1832. Harms, V. W.  
Apparatus for Automatically Stabilizing the Attitude of a Nonguided Vehicle. Sept. 7, 1971.  
US-PATENT-3,603,532

AUTHOR INDEX

- A.
- Abbett, M. J., 841  
 Abbott, F. T., 73  
 Ablow, C. M., 546  
 Abraham, S., 240  
 Acton, C. H., Jr., 544, 671, 702  
 Adachi, R. R., 1237  
 Adams, G. F., 524  
 Adams, J. D., 1199  
 Adamson, M. J., 761, 762, 896  
 Adler, R. J., 487  
 Aggarwal, H. R., 546, 547  
 Ahlstrom, H. C., 1062  
 Ahtye, W. F., 304  
 Aiken, T. N., 24, 148, 149, 150, 151, 194, 237, 238, 250  
 Aitken, F. K., 632  
 Alderman, E. L., 1189  
 Alexander, A. D., 1673, 1674  
 Alexander, A. D., III, 1654, 1741, 1742  
 Alexander, D., 784  
 Alexander, H. R., 391, 407, 410  
 Alfven, H., 440  
 Alksne, A. Y., 748  
 Allan, J. R., 1238  
 Allen, H. J., 295  
 Allen, R. W., 1262  
 Allison, R. L., 392  
 Alsworth, C. C., 1727  
 Alton, L. R., 1686  
 Amelunxen, R. E., 1588  
 Amtmann, E., 1190  
 Anbar, M., 1022, 1024  
 Anderson, D. L., 488, 548, 750, 888, 1003, 1004, 1025  
 Anderson, E., 1443  
 Anderson, J. E., 1688  
 Anderson, L. A., 852, 954, 1614  
 Anderson, S. B., 152, 153, 154, 206, 308  
 Anderson, W. E., 75, 76  
 Anderson, W. T., 1094  
 Androes, G. M., 1026  
 Androsky, A., 1689  
 Anliker, J., 1301, 1302  
 Anliker, J. E., 1335, 1336  
 Anliker, M., 1179, 1303, 1355, 1428, 1447, 1448  
 Annis, J. F., 1183  
 Aoyagi, K., 150, 155, 156, 157, 158, 189, 191  
 Aoyagi, M., 522, 691, 693, 1599  
 Appleton, J. P., 960, 961  
 Ardema, M. D., 1656, 1657, 1658, 1659, 1743, 1744, 1745

ORIGINAL PAGE II.  
 OF POOR QUALITY



Armbruster, R. H., 1205  
Arndt, R. E. A., 1779  
Arno, R. D., 784, 1660, 1661, 1673, 1674, 1746  
Arnold, J. O., 853, 854, 855, 856, 989, 1027  
Arvesen, J. C., 549, 682, 683, 684, 857, 858, 943, 944  
Asato, Y., 1467, 1468, 1544  
Asbridge, J. R., 639, 1045  
Ashleman, R. H., 400  
Ashley, W., 1440  
Atema, J., 1124  
Atencio, A., Jr., 159, 160, 161, 162, 305  
Atlan, H., 1372  
Aubrun, J. -N., 163, 279, 280  
Aubry, M. P., 550  
Aue, W. A., 1480, 1481, 1482  
Auer, S. O., 1148  
Augason, G. C., 613, 743  
Ausrotas, R. A., 294  
Au-Yang, M. K., 32, 100  
Axelson, J. A., 67

B.

Backlund, S. J., 1706, 1707  
Bada, J. L., 1545  
Bader, M., 551, 552, 585  
Badri-Nath, Y., 418  
Baganoff, D., 436, 1040, 1042  
Bailey, F. R., 766, 800, 802, 859, 860, 864  
Bailey, O. T., 1239  
Baker, B. S., 1287  
Baker, G., 1440  
Baker, T. E., 1145  
Baldrighi, G., 1122, 1124, 1125, 1126, 1127  
Baldwin, B., 699, 767, 861  
Baldwin, B. S., 768, 769, 770, 804, 805, 827, 862, 863, 976  
Baldwin, K. M., 1274  
Ballard, R. W., 1469  
Ballhaus, W. F., 802, 859, 864  
Ballinger, E. R., 1440  
Ballou, E. V., 1304, 1305, 1306  
Bambynek, W., 5  
Bame, S. J., 636  
Barchas, J. D., 1227  
Barker, W. A., 599, 753  
Barlow, A. V., 29  
Barman, J. F., 306  
Barnebey, A., 1307  
Barnes, A., 489, 490, 506, 553, 554, 555, 556, 557, 645, 646, 647  
Bar-Nun, A., 96, 891, 1028, 1029  
Bar-Nun, N., 1028  
Baron, S., 1265, 1280  
Barrack, J. P., 164  
Bartz, A. E., 1248

Bassham, J. A., 1266  
Batson, R. M., 671  
Baty, D. L., 1240, 1308  
Bauer, E., 865, 866  
Bauer, S. H., 1028  
Baum, D. W., 373, 374  
Baum, P. J., 558  
Beam, B. H., 1638  
Beam, R., 867  
Beam, R. M., 868, 1000  
Bearden, L., 1266  
Behar, A. J., 1440  
Behar, J. V., 1008  
Belina, F. W., 297  
Beljan, J. R., 1191, 1217  
Bell, P., 1546  
Bencze, D. P., 97, 98, 141  
Bender, J., 1779  
Benedict, J. V., 1267  
Benefield, T. D., 246  
Bensch, K. G., 1372, 1455  
Benson, B. A., 1080  
Benton, E. V., 1239  
Beranek, R. G., 64  
Berdahl, B. J., 1529, 1578, 1579  
Berg, O. E., 527  
Berger, P., 1227  
Berger, P. A., 1228  
Bergquist, L. E., 1078, 1134  
Berkstresser, B. K., 1662  
Bernauer, E. M., 1205, 1206, 1208, 1219  
Bhat, W. V., 78  
Bies, D. A., 259  
Biggers, J. C., 358, 359  
Billingham, J., 1303, 1309, 1418  
Billings, C. E., 1310  
Billman, K. W., 869, 870, 871, 872, 996, 997, 998  
Binnard, R., 1373  
Bisplinghoff, R. P., 19  
Bjorkman, W. S., 376  
Black, D. C., 559, 560, 561, 562, 563, 564, 565, 566, 657  
Black, S., 1325, 1380  
Blackaby, J. R., 1241, 1243, 1312, 1418  
Blakely, R. J., 1110  
Blanchard, M. B., 491, 492, 567, 568  
Blaser, D. A., 1802  
Bobo, C. J., 1780, 1781  
Boese, R. W., 718, 719, 720  
Boissevain, A. G., 427  
Boitnott, C. A., 528, 873, 874, 1030, 1055  
Boles, R. A., 272  
Boltz, F. W., 30, 40, 41  
Bond, M. A., 1348  
Bonner, W. A., 1470, 1547, 1548

Borek, E., 1529  
Born, G. H., 544, 701, 702  
Borucki, J. G., 1033  
Borucki, W. J., 882, 883  
Bössel, H. H., 307  
Botticelli, R. A., 1135, 1136, 1708, 1709  
Bourquin, K., 165  
Bourquin, K. R., 179, 315  
Bousman, W. G., 1771, 1827  
Bowen, S. W., 875, 876, 877  
Bowles, J. V., 1633  
Boyers, D. G., 1192, 1214  
Boylen, C. W., 1471, 1485, 1515, 1549, 1578  
Boynton, C., 1571  
Boynton, C. D., 1572  
Bracchi, F., 1439  
Bradburn, G. A., 1008  
Bradshaw, G. B., 1710, 1711, 1712  
Bradshaw, R. B., 1753  
Bray, R. S., 166, 167, 247, 308, 309  
Brennan, P. J., 1116  
Brice, K. B., 1724  
Briggs, G. A., 536, 663, 671  
Broman, E., 406  
Brooker, J. Z., 1189  
Brown, G. M., 666  
Brown, K. R., 1728, 1729, 1730  
Brown, R. A., 275  
Brown, R. M., 1646  
Brown, S. C., 168, 169  
Brown, W. A., 1079  
Brown, W. E., Jr., 524  
Brownlee, D. E., 569, 570, 632  
Brownson, J. J., 52, 57, 67  
Bruce, R. W., 1713  
Bruckner, J. M. H., 275  
Buckland, G. H., 1382  
Buckley, J. D., 785  
Buhl, D., 1472  
Bull, J. S., 310  
Bull, L. S., 1216  
Bunch, T., 716  
Bunch, T. E., 493, 571, 572, 573, 574, 575, 576, 577, 578, 580, 581, 596,  
640, 655, 656, 666, 711, 712, 713, 714  
Bunnenberg, E., 1484  
Burke, J. A., 1803, 1804, 1805  
Burke, W. J., 579  
Burlingame, A., 1546  
Burnett, D., 1546  
Burnett, G. A., 1727  
Burns, J. J., 982  
Burns, R. K., 797  
Burrous, C. N., 169, 311, 362, 1615  
Bursnall, W. J., 1714, 1715

Burt, J. E., 1716, 1717  
Busche, F. D., 580, 581  
Buti, B., 582, 583, 584  
Buvet, R., 1473

C.

Cagliostro, D. E., 449, 462, 471  
Cahill, J. F., 31  
Cairns, E. J., 1292  
Call, N., 1440  
Call, N. A., 1355  
Callahan, P. X., 1193, 1194, 1215, 1429, 1433  
Callier, F. M., 306  
Cameron, E. N., 666  
Cameron, R. M., 585, 1607  
Campbell, J. M., 260  
Cantor, S. A., 1177  
Capelluro, L. P., 1731  
Caradonna, F. X., 771, 1812, 1818  
Card, D. H., 1338, 1599  
Carl, L. W., 1774  
Carle, G. C., 1550  
Carlson, J. N., 1284, 1285  
Carlson, R. M., 1759  
Caroff, L. J., 586, 587, 593, 613, 727, 743  
Carpenter, L. R., 1376  
Carr, L. W., 1823  
Carr, M. H., 671  
Carroad, P., 1266  
Carson, T. M., 219, 220  
Carterette, E. C., 1307  
Case, L. A., 588  
Casey, H. W., 1355  
Cassen, P., 589, 607  
Cassidy, W. A., 577  
Castellani, P. C. F., 1390  
Castle, B. L., 1182, 1207, 1339, 1340, 1408  
Cayot, J. E., 170  
Celino, V. A., 1311  
Centolanzi, F. J., 772, 773, 795, 878  
Chackerian, C., Jr., 590, 591, 592, 1031, 1061  
Chackerian, M., 987, 1328  
Chacko, G. K., 1664  
Chadha, M. S., 1474, 1475, 1476, 1496, 1573  
Chambers, A., 1238, 1312  
Chambers, A. B., 1241, 1242, 1243, 1260, 1313, 1394, 1418  
Chan, K. L., 496  
Chang, I., 1447, 1448  
Chang, S., 1477, 1502, 1503, 1504, 1523, 1524, 1546, 1551, 1552, 1553, 1554,  
1555, 1556, 1573, 1584  
Chao, F.-C., 1416, 1539, 1543  
Chapman, D. R., 879

Chapman, G. T., 99, 102, 436, 1020  
Charles, B., 406  
Chase, W. D., 1244, 1314  
Cheng, D. Y., 1111  
Chermside, H. B., 1315, 1316, 1317, 1318  
Chevalier, H. L., 1803, 1804, 1805  
Chien, K. -Y., 883, 1032  
Chigier, N., 313  
Chigier, N. A., 171, 172, 312, 314, 341, 769, 862, 863  
Child, R. F., 1781  
Childs, M. E., 132  
Chisel, D. M., 77, 1111, 1128  
Chou, Y. S., 842, 843, 844  
Chow, T. L., 593  
Christensen, J. V., 218, 244  
Christian, J. D., 774, 880, 881  
Chu, W. T., 88, 290, 353  
Chubboy, R. A., 170  
Chyu, W. J., 32, 33, 100, 101, 778  
Cichy, D. R., 401  
Cicolani, L. S., 173  
Ciffone, D. L., 67, 174, 175, 234, 1033  
Clark, B., 1319, 1320, 1321, 1322, 1323, 1397  
Clark, C. F., 905  
Clark, D. L., 1268  
Clark, R. D., 416  
Clay, D. R., 606  
Cleary, J. W., 67, 775, 776, 777  
Clements, H. G., 824, 969  
Cleveland, W. B., 377  
Clifford, J. E., 1269  
Clymer, D. J., 402  
Cockayne, W., 27  
Coe, C. F., 33, 101, 778  
Coffman, M. G., 212  
Cohen, L., 1370  
Colburn, D. S., 431, 438, 443, 444, 445, 494, 495, 500, 512, 533, 550, 579,  
594, 595, 619, 620, 634, 675, 723, 726, 728, 729, 732, 757  
Cole, A. O., 1200  
Cole, H. A., Jr., 79, 1066  
Cole, J. E., III, 261  
Cole, R. K., 1075  
Coleman, J. O., 1390  
Coleman, P. J., 723  
Coleman, P. J., Jr., 432  
Coler, C. R., 1257, 1324  
Colin, L., 496, 779  
Colley, I. A., 1185  
Collins, G. R., 463  
Colombo, G. V., 1270  
Compton, D. L., 6, 7, 99, 435, 436, 1005  
Conner, R. L., 1430  
Connolly, J. P., 1423

Conrad, B., 219, 262, 376, 378  
Conrad, G. H., 580, 596  
Conrad, H. M., 1131  
Cook, A. M., 24, 151  
Cook, W. J., 102, 1023  
Cook, W. L., 382, 424  
Cook, W. S., 1718  
Coombs, W. C., 1151  
Coon, G. W., 780, 1639  
Cooper, C. E., Jr., 1079  
Cooper, D. M., 435, 882, 883, 884  
Cooper, G., 165  
Cooper, G. E., 176  
Coote, M. A., 1723  
Cope land, R. J., 1299  
Corbett, R., 1325, 1380  
Corbett, R. L., 1261, 1431, 1464  
Corliss, L. D., 177, 781, 1760  
Cornsweet, T. N., 1271  
Corsiglia, V. R., 171, 172, 312, 313, 314  
Courtial, B., 335, 337  
Covert, M., 804  
Covington, M. A., 772, 795, 885  
Cowley, J. R., Jr., 1144  
Cox, A., 1110  
Cragin, J. T., 1073  
Cramer, R. L., 886, 887, 1112, 1152  
Crane, H. D., 1271  
Crasemann, B., 5  
Cress, S. B., 364  
Crews, S. T., 1786, 1789, 1806  
Cronin, S. E., 1233, 1234  
Cronn, F. W., 1254, 1375  
Crosmer, W. E., 1104, 1105, 1140, 1141  
Crowley, K. C., 263, 265  
Cruty, M. T., 1239  
Cunningham, B. E., 488, 548, 1003, 1004, 1025  
Cunningham, G. G., 492, 782  
Curry, R. E., 294  
Cuthbertson, J. G., 1192, 1214  
Cutts, J. A., 536, 671

D.

Dahms, R. G., 488, 548, 888, 1003, 1004, 1025  
Daily, W. D., 501, 502, 523, 597, 608, 698  
D'Alelio, G. F., 464, 477  
Dallman, M. F., 1195  
Dalton, B. P., 1561  
Daniels-Severs, A. E., 1196, 1197, 1432  
Dannenberg, R. E., 783, 889, 890  
Daunton, N., 1327  
Daunton, N. G., 1326

Davenport, J. W., 1159  
Davies, M. E., 536, 671  
Davis, S. S., 39, 103, 104, 105  
Davy, W. C., 891, 962  
Day, J. R., 733  
Deboo, G. J., 311, 362, 1595, 1615, 1640, 1641, 1642  
Debra, D. B., 310  
DeCarlo, J. P., 39  
Decker, J. A., Jr., 644  
Deckert, W. H., 421, 422  
DeCoursin, D. G., 89  
Deerwester, J. M., 784, 1661, 1686  
DeGrazia, J. A., 1200  
Deiwert, G. S., 892, 893  
Delateur, L. A., 1716, 1717  
DeMaio, D., 294  
Denardo, B. P., 824, 969  
Denery, D. G., 178, 179, 315, 316  
Depew, C. A., 1080  
DeRose, C., 808  
DeRose, C. E., 799, 938, 1006  
DeRoshia, C. W., 1234  
Desoer, C. A., 306  
DeVaucouleurs, G., 536, 671  
Dewitt, D. P., 845  
De Wolf, D. A., 1159, 1160  
DeWolf, R. W., 294  
Dickey, R. R., 465, 933, 934  
Dickinson, S. O., 212  
Digumarthi, R. V., 88, 290  
Dillenius, M. F. E., 282  
DiMarco, R. J., 1277  
Dimeff, J., 240, 481, 1594, 1595, 1596, 1597, 1598, 1620  
Doane, D. H., 1618  
Dods, J. B., Jr., 35, 36, 101, 106  
Doebbler, G. F., 1275  
Dolkas, C. B., 1328, 1457  
Donaldson, R., 1519  
Donaldson, R. W., 1595  
Donaldson, R. W., Jr., 1540  
Donchin, E., 1329, 1330  
Donovan, T. M., 1034  
Doss, E. D., 80  
Douglas, J. A. V., 666  
Douvillier, J. G., 378  
Dowty, E., 575, 596, 640, 713, 714  
Drago, V. J., 275  
Drake, H. M., 1669  
Drinkwater, F. J., III, 166, 179, 246, 247, 248, 315  
Dryer, M., 598, 894  
Dubach, J., 599, 753  
Dubisch, R., 724, 725  
DuBois, R. L., 497, 498

Dugan, D. C., 177, 781  
Dugan, D. W., 1665  
Dunn, D. G., 264, 265  
Dunn, W. R., 364  
Durbin, E. K., 1820  
Duxbury, T. C., 544, 671, 701, 702  
Dwyer, H. A., 80, 112, 1807, 1808, 1809  
Dyal, P., 443, 497, 498, 499, 500, 501, 502, 523, 600, 601, 602, 603, 604, 605,  
606, 607, 608, 698  
Dyer, J. W., 1144

E.

Eason, W., 391, 410  
Eastwood, D., 538, 539  
Eather, R. H., 540  
Eberhardt, P., 1546  
Eckert, W. T., 180, 181, 182, 183, 230, 245  
Edelson, S., 1035  
Edenborough, H. K., 423  
Edgerton, A. T., 327  
Edmonds, J. D., Jr., 609, 610, 611  
Edsinger, L. E. 784, 1671, 1680  
Edwards, D. K., 1081, 1082, 1094  
Edwards, F. G., 184, 185  
Efting, J. H., 36  
Eggleton, R. E., 524  
Ehler, W., 612, 1036  
Ekblom, B., 1331  
Eldridge, W. M., 403  
El Goresy, A., 666  
Elkins, W., 1272, 1332, 1333, 1409  
Elliott, D. L., 356  
Ellis, S., 1193, 1194, 1215, 1429, 1433, 1451  
Elms, R. V., 1716, 1717  
El-Sum, H. M. A., 266  
Empey, R. W., 1818  
Endrud, G. H., 598  
Erickson, E. F., 613, 743  
Erickson, H., 1222  
Erickson, H. H., 1198, 1199  
Erickson, L. L., 37  
Erlichman, J., 580  
Eross, B., 725  
Erzberger, H., 186, 187, 239, 317, 339  
Esser, A. F., 1557, 1558  
Evans, A. G., 993  
Evans, J. W., 1636  
Evans, L. C., 1666, 1671, 1747  
Evans, R. C., 422  
Eyman, E. D., 1273



## F.

Fahleson, U., 440  
Fairchild, M. K., 1083  
Falarski, M. D., 150, 155, 156, 157, 188, 189, 190, 191, 192, 193, 194, 195,  
196, 213, 214, 252, 318  
Falb, R. D., 1334  
Fan, S., 1719  
Fanning, M. L., 1723  
Farlow, N. H., 527, 552, 568, 614, 615, 616, 617  
Feinler, E. J., 1084  
Feinstein, L., 363, 1067  
Feistel, T. W., 319  
Feller, D. D., 1200, 1201, 1202, 1203, 1434, 1435, 1437, 1438, 1456, 1457  
Feo, A., 344  
Ferrell, J. A., 403  
Ferry, G. V., 568, 614, 615, 617  
Fester, D. A., 1688  
Fichtl, G. H., 215  
Fimmel, R., 1147  
Fimmel, R. O., 1145  
Finger, H., 1301, 1302  
Finger, H. J., 1335  
Fink, R. W., 5  
Fish, R. H., 450, 453, 472, 480, 687  
Fisher, R. K., Jr., 1781, 1810  
Fitzgerald, J. W., 1246, 1419  
Flannery, J. V., 1073  
Fleischman, G. L., 1081, 1082  
Flora, C. C., 402  
Flores, J., 1547  
Flores, J. J., 1474, 1475, 1476, 1478, 1559  
Floyd, R. V., 1336  
Fodor, R. V., 655  
Fogg, R. G., 299  
Fohlen, G. M., 451, 473  
Folsome, C. E., 1479, 1497, 1560  
Fontes, E. J., 474  
Forrest, R. D., 246, 247, 248  
Foshee, W. C., 457  
Foster, J., 236  
Foster, J. D., 185  
Foster, J. V., 1070  
Fox, P., 724, 725  
Franklin, J. A., 197, 198, 199, 320, 321  
French, R., 725  
Freund, H.-U., 5  
Freund, W. R., 1616  
Fricker, P. E., 618, 721  
Friedland, B., 267  
Friedmann, P., 1782, 1783  
Friis-Christensen, E., 619, 620  
Fry, E. B., 166, 200, 202, 246, 248

Fryer, T. B., 352, 369, 1218, 1220, 1221, 1387, 1616, 1617, 1618, 1633, 1635,  
1636, 1643, 1644  
Fujitsuna, Y., 107  
Fujiwara, T., 108  
Furner, R. L., 1202, 1203, 1436, 1437, 1438  
Furst, A., 1315, 1317, 1318, 1392, 1393  
Furth, J., 1446

G.

Gabel, N. W., 1582  
Gaffey, T. M., 405, 423  
Gale, C. M., 292  
Gallagher, J. T., 322  
Galloway, T. L., 1663, 1667, 1669, 1748, 1758  
Gambucci, B. J., 383, 387, 390, 531  
Ganong, W. F., 1195  
Ganzler, B. C., 375  
Garavaglia, A. P., 1645  
Garcia, F., Jr., 38, 49, 111  
Gargiulo, R. J., 470  
Garmany, J. D., 750  
Gartner, W. B., 1274  
Gasper, J. C., 1153  
Gaspers, P. A., Jr., 109  
Gatchel, S., 406  
Gates, R. F., 1073  
Gault, D., 1546  
Gault, D. E., 569, 570, 621, 622, 623, 625, 632, 633, 642, 643  
Gebman, J. R., 1726  
Gehrke, C. W., 1480, 1481, 1482, 1525  
Gera, J., 215  
Gerbrandt, L. A., 1329  
Gerbrandt, L. K., 1330  
Gerdes, R. M., 165, 200, 202, 222, 319  
Gerdts, J. C., 764  
Ghidoni, J., 1440  
Ghista, D. N., 1337  
Gibs, J., 404, 1797  
Gibson, E. K., 1555  
Gibson, E. K., Jr., 1556  
Giem, J. I., 1119  
Gierasch, P., 725  
Gilbert, G. B., 268, 274  
Gilbert, R. A., 19  
Gilbreath, W. P., 774, 895, 1007  
Gilchrist, I. J., 408  
Gilhousen, K. S., 1164, 1166  
Gill, A., 1317  
Gill, E. D., 23, 1538  
Gilliland, K., 1347  
Gillmore, K., 391  
Gilwee, W. J., 466

Ginoza, H. S., 1534, 1544  
Giulianetti, D., 390  
Giulianetti, D. J., 201  
Giver, L. P., 613, 718, 719, 720, 743  
Glass, R. E., 269, 270, 301, 302  
Glende, W. L. B., 413  
Gloria, H. R., 761, 762, 1008, 1024, 1026  
Glusovich, B. C., 1602  
Gnos, A. V., 39  
Goka, T., 169, 323, 356  
Goldfischer, L. I., 1085, 1137  
Goldin, D. S., 1751  
Goldman, A. L., 80  
Goldsberry, R. E., 761, 762, 896  
Goldsmith, R. L., 1362  
Goldstein, B. E., 579  
Goldstein, H., 462, 795  
Goldstein, H. E., 785, 786, 796, 999  
Golub, M. A., 467, 468, 469, 470  
Gonzalez, W., 619, 620  
Goodwin, A., 1197  
Goodwin, A. L., 1230  
Goorjian, P. M., 1776  
Goorvitch, D., 1037, 1038, 1059  
Gordon, D. I., 604  
Gossett, T. D., 202, 322, 1760  
Gowen, F. E., 929  
Graboske, H., 631  
Graham, L. A., 40, 41, 42, 43  
Grant, G. R., 174, 235, 368, 1605, 1619, 1624, 1632  
Grant, T. L., 1152  
Graudenz, J. Y., 1318  
Greeley, R., 503, 504, 505, 508, 520, 522, 624, 625, 626, 627, 628, 629, 630,  
722  
Green, A. K., 846  
Green, J. A., 596, 640  
Green, M. J., 787, 815, 907, 910, 988, 1133  
Greenleaf, C. J., 1341  
Greenleaf, J. E., 1175, 1182, 1204, 1205, 1206, 1207, 1208, 1209, 1219, 1223,  
1224, 1225, 1226, 1331, 1338, 1339, 1340, 1401  
Greenstadt, E. W., 726  
Gregory, T. J., 44, 110  
Greif, R. K., 202, 208  
Grindeland, R. E., 1433, 1446  
Grossman, A. S., 631  
Groves, D. J., 710  
Gualtierotti, T., 1439  
Guist, L. R., 45, 1000  
Gunter, W. D., Jr., 368, 1598, 1632, 1646  
Gupfa, A., 293  
Guthrie, P. D., 706

H.

Haacker, J., 788, 913  
Hackett, J. E., 271, 272  
Hadland, W. O., 1647  
Haefner, K. B., 1086  
Hagen, J. R., 929, 948  
Hagstrom, S. A., 730  
Haight, R. D., 1534  
Haines, R. F., 30, 1206, 1208, 1219, 1246, 1247, 1248, 1341, 1342, 1343, 1344,  
1345, 1346, 1347, 1348, 1349, 1417, 1419  
Hall, C. F., 1146  
Hall, D. F., 1075  
Hall, L. P., 155, 158, 159, 161, 203, 212, 334  
Halpern, B., 1484  
Ham, N. D., 329, 1814  
Hamilton, R. W., Jr., 1185, 1275  
Hammer, J. M., 1796  
Hanegan, J. L., 1350, 1351  
Hanff, E. S., 86  
Hanley, L. D., 1427  
Hanly, R. D., 35, 36, 106  
Hanner, M. S., 1147  
Hansen, C. F., 897, 898, 899, 962  
Hansen, Q. M., 1167  
Hanson, R. K., 893, 1009, 1039, 1040, 1041, 1042, 1043  
Hanson, W. B., 1052  
Hardin, R. D., 1728, 1729, 1730, 1731  
Hardy, G. H., 204  
Hare, D. E., 1310  
Hare, P. E., 1567  
Harendra, P. B., 405  
Harkonen, D. L., 260  
Harms, V. W., 1832  
Harper, C. W., 8  
Harris, J. W., 401  
Harrison, D. C., 1189  
Harrison, D. R., 1596, 1620, 1637  
Harrison, G., 1176  
Harrison, G. A., 1210, 1211, 1239, 1352, 1353  
Harrison, W. D., 1731  
Hart, J. P., 1602, 1603  
Hartle, R. E., 490, 506  
Hartmann, R. A., 1083  
Hartmann, W. K., 544, 671, 701, 702  
Hartner, W. C., 1396  
Hartung, J. R., 569, 570, 621, 623, 632, 633, 642, 643  
Haskin, L., 1546  
Haughney, L. C., 514, 515, 516  
Havill, C. D., 1668  
Hayashi, D. T., 1354  
Hayden, R. E., 273  
Hayes, R. L., 1625

Haymaker, W., 1239, 1355, 1440, 1441, 1442, 1443  
Hays, E. L., 1376  
Heath, J. E., 1356, 1357, 1396, 1412, 1413  
Heckart, M. V., 1728, 1729, 1730  
Hedlund, R. C., 1641, 1642  
Hegarty, D. M., 219, 220  
Heimbuch, A. H., 481  
Heimerl, J. M., 649  
Heimlich, P. F., 1296, 1297  
Heinemann, K., 900, 901, 902, 903, 904, 1010, 1034, 1044, 1054  
Heinrich, M. R., 1483  
Heising, K. W., 454  
Helf, S., 406  
Heller, J. A., 1095, 1164  
Henderson, M. E., 1540  
Henshaw, J., 472, 687  
Herman, M. M., 1444, 1461  
Hermansen, L., 1331  
Hersh, A. S., 273  
Hertel, R., 537  
Hetherington, N. W., 1212, 1217, 1235, 1445  
Hewitt, J. E., 17, 20  
Hickey, D. H., 210, 324  
Hickman, K. E., 274  
Hickox, T. E., 92  
Hicks, J. G., 1822  
Hicks, R. M., 38, 46, 47, 48, 49, 51, 61, 62, 111  
Hiester, N. K., 905  
Higgins, E. A., 1212  
Higgins, T. P., 1720  
Hill, J. W., 1276  
Hill, P. G., 268, 274  
Hinson, W. G., 1610  
Hinterkeuser, E. G., 1784  
Hinterkeuser, W. Z., 1797  
Hipskind, S. G., 1223  
Hirshberg, J., 507, 634, 635, 636, 637, 638, 639, 1045  
Hitchman, M. J., 1423  
Hitt, E. F., 275  
Hlava, P. F., 596, 640  
Hob, R. H., 420  
Hochstein, L. I., 1508, 1531, 1532, 1536, 1537, 1561  
Hodder, B. K., 205, 334, 353  
Hodges, D. H., 1761, 1762, 1811, 1826  
Hodgson, G. W., 1484, 1562  
Hoerz, F., 517  
Hörz, F., 569, 570, 621, 623, 632, 633, 641, 642, 643  
Hoffman, J., 456  
Hoffman, R. A., 1358, 1366  
Hofman, L. B., 1113, 1168  
Hofstetter, W. R., 31, 73  
Hoh, R. H., 276, 1278  
Hohenemser, K. H., 1785, 1786, 1787, 1788, 1789, 1806

Hollahan, J. R., 1359, 1360, 1361, 1420, 1421  
Holland, V. B., 1458  
Hollenbeck, G. R., 1718, 1721, 1722  
Holligan, P. E., 1723  
Holloway, P. F., 111  
Holm, M., 537  
Holzhauser, C. A., 384, 385, 386, 387, 421  
Homeyer, W. G., 1710, 1711, 1712  
Honda, T. S., 1086, 1087  
Hood, W. N., 1358  
Hopkins, E. J., 50, 55, 56, 112, 113, 118  
Hopson, G., 1376  
Hornemann, U., 742  
Hornig, A. W., 538, 539  
Horodyski, R. J., 1530  
Horonjeff, R., 1719  
Horsewood, J. L., 1724  
Horstman, C. C., 793, 906, 924, 950, 951, 952  
Hossain, S., 1362  
Houck, J. R., 644  
Hough, G. R., 325, 326, 344  
Howard, E. G., 1715  
Howard, J. C., 1249, 1363, 1364, 1365  
Howard, W. H., 1237  
Howe, J. T., 907, 908, 909, 910, 930, 964, 988  
Hruby, R. J., 327, 363, 364, 1067  
Hubbard, R. W., 1084, 1366  
Hudock, R. J., 1649  
Huff, E., 1308  
Humason, G., 1239  
Humbert, J. E., 1423  
Hung, R. J., 554, 555, 645, 646, 647  
Hunton, L. W., 42, 51  
Hurkamp, C. H., 1725  
Huss, G. I., 574  
Hutchison, P. B., 1147  
Hutton, M. F., 267  
Hyatt, K. H., 1177  
Hyde, J. H., 628  
Hynes, C. S., 170

I.

Ibrahim, M. Z. M., 1440  
Ige, R., 1266  
Ingelfinger, L., 1376  
Ingerson, F. E., 529  
Ingram, C. W., 1765  
Inn, E. C. Y., 648, 649, 650  
Innis, R. C., 197, 198, 206, 222, 385, 386, 390  
Inouye, M., 911, 968, 930  
Intrieri, P. F., 67, 1011, 1048, 1114  
Intriligator, D. S., 651, 652

Isom, M. P., 1812  
Ito, A., 1446  
Iufer, E. J., 1110, 1115  
Iverson, J. D., 505, 508  
Iyenger, S., 81

J.

Jackson, P., 524  
Jackson, R. P., 19  
Jackson, R. W., 1144  
Jacob, H. G., 207, 328  
Jacobs, H. K., 1396  
Jacobs, I. M., 1095, 1164  
Jacobsen, R. A., 208, 313  
Jacobson, L. B., 1177  
Jaeger, M. A., 263  
James, O., 1546  
James, T. C., 653, 654  
Jarosewich, E., 1495  
Jaynes, D. N., 1595  
Jedlicka, J., 788, 867  
Jedlicka, J. R., 912, 913, 1000  
Jelinek, F., 1088, 1164  
Jenkins, D., 1366  
Jennings, R. R., 457  
Jex, H. R., 1262  
Joglekar, M. J., 405  
Johnson, C. M., 1232  
Johnson, D. A., 114, 115  
Johnson, D. L., 914  
Johnson, E. J., 1506, 1507, 1563  
Johnson, M., 1444  
Johnson, R. D., 1505  
Johnson, R. O., 1135, 1136, 1708, 1709  
Johnson, W., 209, 329, 1763, 1813, 1814, 1815  
Johnson, W. A., 276, 1277, 1278, 1279, 1286  
Johnson, W. R., 330  
Johnston, J. P., 144  
Johnston, W. M., 1725  
Jones, D. W., Jr., 1735, 1736  
Jones, E., 1447, 1448  
Jones, G. M., 1327  
Jones, J. H., 111  
Jones, J. L., 3, 1422  
Jones, M. T., 1195  
Jones, R. T., 4, 9, 10, 15, 16, 40, 41, 43  
Jones, T. B., 1089, 1090, 1091, 1161  
Jordan, R., 524  
Jorgensen, L. H., 52, 53, 54, 116  
Juhos, L., 1182, 1205, 1225

## K.

Kaattari, G. E., 789, 790, 808  
Kanafani, A., 1719  
Kaplan, G. S., 1160  
Kaplan, I. R., 1477, 1584  
Karamcheti, K., 119  
Kardon, M. B., 1398  
Karmarkar, J. S., 331, 332, 333  
Katvala, V., 786  
Katzen, E. D., 67  
Katzner, M. F., 457  
Kavdahl, H., 400  
Kazin, S. B., 277  
Keene, D. W., 294  
Keener, E. R., 55, 56, 57, 112, 113, 117, 118  
Keil, K., 572, 573, 574, 575, 576, 580, 581, 596, 640, 655, 656, 666, 711,  
712, 713, 714  
Keil, L. C., 1197  
Keller, R., 285, 286, 287  
Kelley, G. S., 284  
Kellman, S. A., 657  
Kelly, M. W., 210, 211, 230, 324, 345  
Kelsey, R. A., 847  
Kemp, J. H., Jr., 791, 915  
Kemp, R. F., 1075  
Kenyon, D. J., 1185  
Kenyon, G. C., 1669  
Kerr, A. W., 1759  
Kerridge, J. F., 658, 659  
Kerwin, W. J., 372  
Khalafalla, A. S., 1295  
Khan, I. H., 660, 916, 917  
Khare, B. N., 707  
King, H. M., 785  
King, L. S., 58, 119  
King, R. F., 1402, 1621  
Kinnen, E., 348  
Kirby, T. B., 671  
Kirk, D. B., 14, 1011  
Kirk, J. H., 1355  
Kirk, J. V., 159, 161, 164, 203, 212, 334  
Kirkpatrick, A. R., 1092  
Kirkpatrick, J., 1170  
Kirkpatrick, J. P., 1076, 1116, 1117, 1118, 1153  
Kirkwood, T. F., 1726  
Kivelson, M. G., 550  
Kizilos, A. P., 1796  
Klein, G., 1210  
Klein, H. P., 1172, 1173, 1174, 1585  
Klein, K. E., 1217  
Klein, R. H., 276, 420  
Kleinman, D. L., 1280



Klineberg, J. M., 120, 121, 975  
Kluger, M. J., 1357  
Knauer, S. C., 1119  
Knechtel, E. D., 918, 919, 920, 921  
Knight, D. D., 921  
Knight, R. G., 278  
Kochendorfer, F. D., 1146  
Kodani, H. M., 1764  
Koenig, D. G., 156, 157, 188, 189, 191, 192, 196, 199, 213, 214, 318  
Kohler, G., 404  
Koncsek, J. L., 82  
Kosson, R., 1103, 1170  
Kostiw, L. L., 1485, 1564  
Kourtides, D. A., 452, 455  
Kovács, I., 990  
Kreifeldt, J. G., 1250  
Kress, D., 1427  
Kretz, M., 279, 280  
Krupp, J. A., 122  
Kruse, R. L., 59  
Krutz, R. W., Jr., 1606, 1622, 1629  
Kubin, R. F., 1046  
Kubokawa, C. C., 1367  
Kubota, T., 121  
Kuczynski, W. A., 1790, 1791, 1792, 1816, 1817  
Kuehn, D. M., 792, 922, 923  
Kuhlenbeck, H., 1442  
Kuhn, P. M., 661  
Kulfan, R. M., 83  
Kumer, J. B., 1079  
Kunieda, H., 1012  
Kunz, L. W., 613, 743  
Kuo, K., 1480, 1481  
Kuo, K. C., 1525  
Kurkowski, R. L., 215  
Kussoy, M. I., 793, 924  
Kutler, P., 794, 801, 925, 926, 927, 928, 966, 986  
Kvenvolden, K., 1477, 1562  
Kvenvolden, K. A., 1480, 1481, 1482, 1484, 1486, 1487, 1488, 1489, 1494, 1495,  
1497, 1512, 1525, 1526, 1530, 1545, 1551, 1552, 1555, 1565, 1566, 1567, 1593

L.

Labak, L. J., 1281, 1368  
LaBerge, J. G., 86  
Lai, D. C., 1336  
Lakhina, G. S., 583  
Lampkin, E. C., 1324, 1369  
Land, D. W., 1098, 1099  
Landau, I. D., 335, 336, 337, 338  
Lane, J. W., 1598  
Lang, A. L., Jr., 1162, 1163  
Lanyi, J. K., 1490, 1491, 1492, 1493, 1498, 1499, 1558, 1568

LaPorte, T. R., 1282  
Lapp, N. L., 1211  
Larche, M., 279, 280  
Larsen, H. J., Jr., 1611  
Larson, H. K., 795, 947, 967  
Lassen, K., 619, 620  
Latham, E. A., 60, 123  
Laub, G. H., 1764  
Lavery, N. P., 1074, 1138  
Lawless, J., 1477, 1479  
Lawless, J. G., 1474, 1475, 1494, 1495, 1496, 1497, 1560, 1569, 1570, 1571,  
1572  
Lawrence, R. E., 94  
Leach, C. S., 1180, 1181, 1230, 1231, 1233, 1234  
Leban, M., 1414  
Leban, M. I., 1304, 1305, 1362  
Leckie, J. O., 1559  
Lecocq, J., 1393  
Lederberg, J., 671, 724, 725, 1172  
Lee, G., 898, 929  
Lee, H., 1449, 1450  
Lee, H. J., 437  
Lee, H. Q., 187, 216, 255, 339, 340  
Lee, R. D., 365, 366, 367, 1218, 1648, 1649, 1650  
Lees, L., 121  
Lehwalt, M. E., 1541  
Leifer, L. J., 1253, 1329, 1370  
Leighton, R. B., 671  
Leiser, D., 786, 999  
Leiser, D. B., 796  
Lem, H. Y., 614, 616, 670, 747  
Leon, H. A., 1213, 1239, 1328, 1354, 1384, 1423  
Leonard, E. T., 996  
Leovy, C. B., 662, 663, 664, 671  
Lerner, N. R., 471  
Levin, A. D., 138  
Levine, S., 1430  
Levinsky, E. S., 281  
Levinthal, E., 671, 724, 725  
Levison, W. H., 1265, 1283  
Levy, L. L., Jr., 797  
Lewis, C. A., 1153  
Lewis, C. F., 578  
Lewis, P. L., 684  
Lewis, P. S., 1718, 1721  
Lewis, R. P., 1371  
Lezius, D. K., 217  
Lieberman, M. M., 1498, 1499  
Lilley, D. G., 341  
Lincoln, K. A., 930  
Lincoln, R., 1251  
Lind, R. C., 798  
Lindberg, R. L., 1239

Lindsay, I. R., 1440  
Linebarger, R. N., 1337  
Ling, C., 267  
Linlor, W. I., 524, 612, 1047  
Lippe, P., 379  
Liu, H. T., 1794  
Liu, T.-M., 930, 931, 932  
Lockman, W. K., 799, 808, 938, 1006  
Loew, G. H., 1500, 1501, 1502, 1503, 1504, 1573  
Loewenstein, M., 665, 740  
Logan, S. E., 346  
Lojko, M. S., 661  
Lomax, H., 800, 801, 802, 925, 928, 977, 986  
London, R. J., 1793, 1800, 1801  
Look, B. C., 1239  
Lorell, K. R., 1129  
Lorenson, M., 1433  
Lorincz, D., 234  
Lovas, M. J., 520, 522  
Love, W. L., 821  
Lovering, J. F., 666  
Low, M., 1529  
Lowell, C. E., 773, 878  
Lu, J. Y., 1726  
Lucero, D. P., 1505  
Luecke, R. H., 1396  
Luetscher, J. A., 1192, 1214  
Luidens, R. W., 211  
Lum, H., Jr., 1154  
Lumb, D. R., 1166, 1169  
Lundell, J. H., 932, 934  
Lundell, R. H., 465  
Lundgren, P. R., 1373  
Lushbaugh, C. C., 1239  
Luzzi, E. P., 1623, 1628  
Lynn, J., 1334  
Lyon, I., 1564

M.

MacCormack, R. W., 803, 935  
MacElroy, R. D., 1469, 1506, 1507, 1563, 1591  
Mack, H. M., 1506  
Mack, M., 392  
Mack, P. B., 1231, 1233, 1358, 1445  
Mack, R., 1556  
MacKay, J. K., 401  
MacKay, J. S., 1660, 1670, 1671, 1746, 1749  
Mackenzie, W., 1176  
MacWilliams, D. C., 457  
Madsen, R. G., 496  
Maeda, H., 667  
Maekawa, K., 667

Magdaleno, R. E., 1289  
Magee, J. P., 407  
Magner, J. E., 459  
Magnus, R., 84  
Mahal, A. S., 408  
Mahan, M., 694  
Maki, R. L., 180, 181, 201  
Malcolm, G. N., 67, 1048, 1114  
Malich, C. W., 1252  
Mall, A. P., 578  
Maloney, J. E., 1408  
Mancini, R., 380, 1177  
Mancini, R. E., 1606, 1622, 1623, 1628, 1629, 1630  
Mandeville, J.-C., 509, 668, 669, 670  
Mangrum, E., 1753  
Mann, H. M., 1147  
Manning, L. A., 1671, 1672, 1679, 1680, 1681, 1750  
Mansnerus, R., 1281  
Marcus, B. D., 1081, 1082, 1093, 1094, 1117, 1118  
Margozzi, A., 1519  
Margozzi, A. P., 1595  
Mark, H., 5, 8, 11, 12, 13, 869  
Markham, J. W., 379  
Marr, R. L., 405, 409  
Marsden, S. S., Jr., 1526  
Marshall, R. D., 1284, 1285  
Martin, C., 342  
Martin, C. F., 231  
Martin, E. D., 767, 804, 805, 806, 807, 936, 937  
Martin, J. M., 1446, 1765, 1818  
Marvin, J. G., 808, 911, 938  
Mascy, A. C., 1749, 1751  
Mason, R. H., 513  
Masursky, H., 536, 671  
Mateer, G. G., 794, 808, 809, 810, 811, 938, 939, 965  
Matsuhira, D. S., 1645  
Matting, F. W., 795  
Mawardi, O. K., 266  
Mayer, A., 371  
Mayfield, E. B., 1035, 1108  
Mayhew, L. B., Jr., 1349  
Mayo, F. R., 458  
Mayo, M. G., 1738, 1740, 1758  
Mazumder, M. K., 1612  
McAlister, K. W., 1819  
McBarron, J. P., 83  
McCasland, G. A., 1392  
McCauley, J. F., 671  
McClatchie, E. A., 1595  
McClenahan, J. O., 671, 1013, 1014, 1037, 1068, 1069  
McCloud, J. L., 193, 253  
McClure, P. T., 1726  
McCormick, P. T., 673, 674, 753

McCroskey, W. J., 1766, 1767, 1807, 1808, 1809, 1810, 1818, 1820, 1821, 1822  
McCullough, R. P., 1359  
McDevitt, J. B., 812, 940  
McDonald, J. K., 1194, 1215, 1429, 1451  
McElroy, M. B., 1052  
McFarland, L. Z., 1232  
McGee, L. A., 218, 219, 220  
McGuirk, J. P., 941  
McHugh, F. J., 410  
McKee, J. W., 403  
McKenzie, R. L., 813, 942, 1001  
McKibbin, D. D., 652  
McKinney, M. O., 211  
McLane, R. C., 1295  
McLean, J. D., 221, 339, 340, 343  
McMahon, D. F., 1214  
McMinimy, W. R., 1715  
McNeill, W. E., 222  
McPherron, R. L., 550, 675  
McRuer, D. T., 1279, 1286, 1298  
McVeigh, M. A., 411, 412  
Medan, R. T., 223, 224, 225, 226, 227  
Mehler, W. R., 1403, 1452, 1453, 1463  
Mehlman-Balloffet, G., 1049  
Meissinger, H. F., 1751  
Meldrum, D. F., 263  
Melick, H. C., Jr., 85  
Mellenthin, J. A., 67  
Mende, S. B., 540, 541  
Mendenhall, M. R., 282  
Mendoza, J. P., 38, 46, 47, 48, 49, 51, 61, 62  
Menees, G. P., 814  
Meng, C.-I., 676, 677  
Merek, E. L., 1515, 1574, 1578, 1579, 1592  
Merrick, R., 231  
Merrick, R. B., 219, 220, 228  
Merrick, V. K., 229  
Merrill, G. L., 1727, 1773  
Messiter, A. F., 344  
Mihailovic, Lj. T., 1396  
Mihalov, J. D., 439, 443, 446, 510, 511, 512, 542, 676, 677, 678, 679, 680  
Miles, J. B., 1243  
Millard, J. P., 549, 681, 682, 683, 684, 815, 857, 858, 943, 944, 1133  
Miller, D. L., 265  
Miller, J. E., 1508  
Miller, J. H., 719, 720  
Miller, R. J., 953  
Miller, S. C., 1689  
Mills, S. H., 1356, 1357  
Milton, D. J., 671, 701  
Miquel, J., 1372, 1373, 1383, 1440, 1441, 1444, 1454, 1455, 1461  
Mitra, G., 1266  
Mobley, R. E., 585, 1607

Moe, C. R., 1716, 1717  
Mogharabi, A., 1719  
Mohling, R. A., 849, 978  
Mollenkof, P. A., 411, 412  
Molton, P., 1510, 1575, 1576, 1583  
Molton, P. M., 1509  
Mondt, J. F., 1752  
Monson, D. J., 945  
Montgomery, M. D., 675  
Moore, C., 1494  
Moore, G. W., 1556  
Moore, J. T., Jr., 671  
Moore, R. B., 596  
Moorhead, R. D., 946, 1054  
Mord, A. J., 613, 743  
Moreland, G., 596  
Morello, S. A., 385  
Morgan, R. B., 520  
Morgan, R. G., 488, 1003, 1025  
Morris, J., 391  
Morrison, D., 708  
Morrison, R. H., 517, 519, 521, 695, 1015  
Morse, J. T., 1219  
Mort, K. W., 182, 183, 210, 230, 345  
Muhlstein, L., Jr., 63, 64, 124  
Mulally, A. R., 83  
Mulholland, D. R., 18, 513, 514, 515, 516, 685, 686  
Munch, N. E., 1753  
Munoz, E. F., 1586  
Munoz, R. M., 760, 1533  
Murakami, J. K., 83  
Murman, E. M., 122, 125, 126, 127  
Murphy, J. D., 128, 129, 130, 131, 133  
Murphy, J. P., 1129  
Murphy, M. R., 1374  
Murray, B. C., 671  
Murray, J. B., 691  
Mutter, H., 410  
Myers, R. D., 1396

N.

Nachtsheim, P. R., 787, 931, 932, 947, 948, 964  
Nagel, D. C., 1307  
Narendra, K. S., 351  
Nark, T. C., Jr., 425  
Nash, J. F., 1774, 1822, 1823  
Neal, G. T., 409  
Neel, C. B., 453, 472, 514, 515, 516, 685, 687  
Neel, C. B., Jr., 513  
Nehru, C. E., 596, 640  
Neiss, J. A., 1689  
Nelms, W. P., Jr., 65, 66

Nelson, B. W., 427  
Nelson, H. G., 816, 817, 818, 914, 949, 991, 1016, 1017, 1050, 1051, 1063,  
1064, 1065  
Ness, N. F., 439  
Neumann, F., 231, 232, 236  
Neumann, F. D., 83  
Neville, E. D., 1200, 1201, 1202, 1434, 1435, 1437, 1456, 1457  
Newland, J. H., 472, 687  
Nicholls, R. W., 854, 855, 856, 990, 1027  
Nichols, F. H., 772  
Nickson, T. B., 291  
Nicolet, W. E., 963  
Nielsen, H. L., 134  
Nielsen, J. N., 543  
Niemann, H. B., 14  
Nier, A. O., 1052  
Nisbet, J. W., 83  
Nishioka, K., 1660, 1673, 1674, 1746, 1753  
Noble, E. C., 83  
Noble, S. C., 1119  
Noda, H., 1511  
Noden, P., 1440  
Noerdlinger, P. D., 587, 688, 689, 727  
Noiseux, D. U., 283  
Noland, M., 544, 671, 690, 701, 702  
Norman, S. D., 1754  
Norman, S. M., 784, 1680, 1686  
Nordmark, G. E., 847  
Novak, S. R., 1019, 1060  
Nowak, D., 1105  
Nowak, P., 1141  
Noyes, J., 379  
Nunamaker, R. R., 1144  
Nurick, W. H., 1613

O.

Oberbeck, V. R., 517, 518, 519, 520, 521, 522, 691, 692, 693, 694, 695, 696,  
716  
O'Brien, W. E., 1577  
Odenwalder, J. P., 1095, 1164, 1168  
Oehler, D. Z., 1512, 1530  
Ogden, E., 1428, 1432  
Ohring, G., 705  
O'Keefe, J. V., 260, 425  
O'Keefe, V. O., 284  
Okoye, N. N., 1316  
Okrusch, M., 571  
O'Leary, B., 697  
Olsen, E., 493  
Olsen, J. H., 1794  
Onischak, M., 1287  
Onken, R., 233

Orlick-Rückemann, K. J., 86, 87  
Orloff, K. L., 174, 234, 235, 307, 346, 368, 1605, 1619, 1624  
Ormiston, R. A., 1762, 1768, 1769, 1770, 1771, 1806, 1811, 1824, 1825, 1826,  
1827, 1828, 1829  
Osborne, R., 1376  
Osder, S., 236, 285, 286, 287  
Osder, S. S., 1120, 1167  
Otto, D. A., 1253  
Owen, F. K., 791, 906, 915, 950, 951, 952  
Oyama, J., 1178, 1190, 1216, 1458  
Oyama, V. I., 1513, 1514, 1515, 1541, 1578, 1579, 1590, 1592

P.

Page, R. J., 132  
Page, V. R., 237, 238  
Page, W. A., 953, 989, 1053  
Painter, J. A., 288  
Painter, J. H., 1098, 1099  
Palmer, E. A., 165, 1251, 1254, 1255, 1256, 1375  
Pannell, C. E., 459  
Panuska, J. A., 1396  
Papike, J., 1546  
Pappas, C. C., 808, 819, 938  
Park, C., 820, 821, 876, 877, 941, 954, 955, 956, 957, 958, 959, 960, 981  
Park, K. E., 169, 347, 348  
Parker, J. A., 451, 452, 455, 460, 462, 465, 466, 468, 472, 473, 475, 476,  
477, 479, 480, 481, 482, 483, 687  
Parkin, C. W., 443, 497, 498, 499, 500, 501, 502, 523, 600, 601, 602, 603,  
605, 606, 607, 608, 698  
Parks, G. K., 675  
Partridge, R. D., 1405  
Patel, V. C., 1774  
Paterson, J. A., 990  
Patterson, D. H., 415  
Patton, J. M., Jr., 385  
Patton, R. M., 1257, 1324  
Paullay, A. J., 935  
Paulson, J., 694  
Payne, P. A., 1096, 1097  
Payne, R. M., 1398  
Pearson, B. D., Jr., 681, 983  
Pearson, J., 383  
Pearson, W. E., 899, 961, 962  
Peart, N. A., 264, 265  
Peckett, A., 666  
Pecoraro, J. N., 1376  
Pecsvaradi, T., 186, 239, 317, 349, 350, 351  
Pedersen, D. M., 1377  
Peebles, W. J., 524  
Pegram, G. V., 1382  
Pelligra, R., 379, 380, 1630  
Pering, K. L., 1516, 1580, 1581



Perry, M. P., 1089, 1090, 1091  
Peters, D. A., 1772, 1825, 1829  
Petersen, E. V., 661  
Petersen, R. H., 1675, 1755  
Peterson, D. L., 963, 964, 984, 985  
Peterson, E., 1484, 1488, 1494, 1495, 1545, 1562, 1567  
Peterson, V. L., 67  
Petrofsky, J. S., 1223  
Petrosian, V., 586, 688  
Petrowski, C., 1551, 1584  
Phillips, R., 666  
Phillips, R. J., 524  
Philpott, D. E., 1239, 1325, 1372, 1378, 1379, 1380, 1399, 1416, 1455, 1459,  
1460, 1539  
Piazza, J. E., 182, 183  
Pirello, C. J., 1728, 1729, 1730, 1731  
Pitts, G. C., 1216  
Pitts, J. N., Jr., 1008  
Pitts, S. W., 1684  
Pitts, W. C., 919, 920, 982  
Plant, A. G., 666  
Platt, W. T., 1458  
Plotkin, A., 289  
Poisson-Quinton, Ph., 424  
Polaski, L. J., 1155  
Polek, T. E., 112, 117  
Polkowski, G., 716  
Pollack, J., 558, 631  
Pollack, J. B., 505, 508, 536, 544, 644, 662, 663, 664, 671, 690, 699, 700,  
701, 702, 703, 704, 705, 706, 707, 708, 724, 725, 744  
Pollock, G. E., 1488, 1517, 1518, 1519, 1540  
Ponnamperuma, C., 1472, 1473, 1474, 1475, 1476, 1477, 1478, 1479, 1480, 1481,  
1482, 1484, 1494, 1495, 1510, 1511, 1516, 1520, 1521, 1522, 1523, 1524,  
1527, 1528, 1538, 1560, 1562, 1576, 1582, 1583  
Pope, J. M., 240, 352, 369  
Poppa, H., 865, 866, 900, 901, 902, 903, 904, 946, 1054  
Poppoff, I. G., 525, 751, 753  
Porcello, L. J., 524  
Portenier, W. J., 1689, 1732  
Porter, R. A., 1186  
Porter, R. F., 275  
Portwood, H., 1354  
Posch, R. E., 981  
Post, S. E., 387, 388  
Postula, F. D., 1710, 1711, 1712  
Powell, J. D., 1300  
Powell, W. V., Jr., 278  
Power, L. J., 241  
Praytor, E. B., 272  
Prelewicz, D. A., 1788  
Presley, L. L., 870, 998, 1009  
Pribram, K. H., 1330  
Price, R. E., 5, 709, 710

Prinz, M., 573, 575, 576, 580, 581, 596, 640, 656, 666, 711, 712, 713, 714  
Prizlow, J. A., 278  
Probst, H. B., 773, 785, 878  
Putkey, T., 1392

Q.

Quaide, W. L., 517, 575, 580, 641, 694, 715, 716, 717  
Quam, L., 724, 725  
Quattrone, P. D., 1381, 1415  
Quigley, H. C., 389, 425, 426

R.

Rabinowitz, J., 1524  
Radosevich, R., 1625  
Ragent, B., 1626  
Rakich, J. V., 794, 965, 966, 978  
Ralston, R. H., 1310  
Rambaut, P. C., 1180, 1181, 1230, 1231, 1233, 1234, 1235  
Ramdohr, P., 666  
Randle, R. J., 1374  
Rao, G. V. R., 88, 290, 353  
Rao, P. V., 5  
Rapport, M., 1338  
Rash, J. J., 1481, 1525  
Rasmussen, D., 1386, 1388  
Rasmussen, D. N., 1337, 1602, 1603  
Ratcliff, J. D., 222  
Ray, K. S., 223, 225, 226  
Rea, F. G., 275  
Reardon, W. C., 1637  
Reasoner, D. L., 579  
Reda, D. C., 129, 130, 131, 145  
Reddy, N. M., 823  
Reed, D. R., 1101  
Reed, G., 1546  
Reese, D. E., 14  
Reese, R. D., 1411  
Regas, J. L., 718, 719, 720  
Regestein, Q. R., 1382  
Rehfuss, D. E., 967  
Reid, A. F., 666  
Reinhardt, W. A., 767, 768, 770, 822, 926  
Reinisch, R. F., 761, 762, 896, 1008, 1024, 1026  
Reller, J. O., Jr., 513, 514, 515, 516, 526, 823  
Remus, G. A., 1281, 1368  
Renshaw, J. H., 1733, 1734  
Replogle, L., 1476  
Reynolds, R., 631  
Reynolds, R. M., 989  
Reynolds, R. T., 589, 618, 721  
Riccitiello, S. R., 451, 454, 463, 473, 474, 482, 483

Rich, A., 1172  
Rich, F. J., 579  
Rideout, V. C., 1187  
Riegel, C. A., 752  
Rimmer, T., 1301, 1302, 1335  
Rinehart, J. S., 722  
Rinehart, W. A., 1098, 1099  
Ringland, R. F., 1288, 1289  
Rizzi, A. W., 893, 968, 974  
Roach, D., 1482  
Robbins, D. E., 656, 639, 1045  
Roberge, A. M., 145  
Roberts, L., 25, 26  
Robinson, F., 1795  
Robinson, G. H., 175  
Robinson, J. C., 671  
Rocca, E., 1439  
Rockstein, M., 1383  
Rodrigues, R. M., 710  
Rodsén, R. G., 527  
Roebelen, G. J., Jr., 1290, 1291  
Roedder, E., 1487  
Roepcke, F. A., 291  
Rogers, R. A., 292  
Rohrbach, C., 1758  
Romiez, M., 1479, 1560, 1571  
Romiez, M. P., 1542  
Roos, D. G., 1718, 1721  
Rose, R. E., 1142, 1173, 1796  
Rose, W. C., 68, 115, 132, 133, 134, 135, 825  
Rosenberg, R. L., 723  
Rosenblatt, L. S., 1191, 1212, 1217, 1235, 1445  
Rosenstein, H., 411, 412  
Rositano, S. A., 380, 1177, 1218, 1246, 1419, 1606, 1622, 1623, 1627, 1628,  
1629, 1630, 1631, 1651, 1652  
Rossen, J. N., 1706, 1707  
Rosser, R. W., 466, 480, 484  
Rossow, V. J., 242, 354, 355, 824, 969  
Rotheram, M., 1100, 1139  
Rouse, W. E., 1120, 1167  
Rowley, P. D., 870, 998  
Rubesin, M. W., 825, 970  
Rubinstein, L. J., 1441, 1461  
Rudolf, W. P., 1101  
Ruff, W., 1338  
Ruff, W. K., 1207  
Rumsey, P. C., 392, 413, 414, 426  
Runcorn, S. K., 441, 442  
Runnels, J. N., 293  
Rushmer, C. R., 1723  
Rusnak, W., 27  
Russ, R. F., 848  
Russell, C. T., 550

Russell, L. D., 1608, 1638, 1653  
Ryu, J., 524

S.

Saaski, E. W., 1102, 1121, 1165  
Sabine, J. C., 1384, 1385  
Sadoff, M., 1376  
Sagan, C., 544, 644, 671, 701, 702, 724, 725, 1028  
Sagan, L. A., 1205  
Sakai, H., 1551, 1584  
Sakellaris, P. C., 1236, 1462  
Salpeter, E. E., 586  
Sambell, K. W., 409  
Sammonds, R. I., 1018  
Samorajski, T., 1239  
Sanator, R. J., 39  
Sanders, W. J., 1189  
Sandler, H., 352, 380, 1177, 1189, 1198, 1199, 1205, 1206, 1208, 1218, 1219,  
1220, 1221, 1222, 1337, 1371, 1386, 1387, 1388, 1398, 1616, 1617, 1618,  
1623, 1628, 1629, 1630, 1633, 1634  
Sanyal, S. K., 1526  
Sapp, O. L., 23  
Satayanarayana, T., 1585  
Sauerbrey, W. J., 1080  
Savage, H. F., 528, 873, 1030, 1055  
Sawko, P. M., 451, 474, 485, 486  
Saworotnow, I., 322  
Sawyer, C. D., 1752, 1756, 1757  
Saxinger, C., 1527, 1528  
Saxton, C., 1238  
Scarf, F. L., 726  
Scargle, J. D., 553, 587, 689, 727  
Schaack, D., 644  
Schaber, G., 524  
Schaefer, H. J., 20  
Schaupp, R. W., 1752, 1756, 1757  
Schein, A., 1529  
Schiff, L. B., 971, 972  
Schlitt, K. R., 1077  
Schlundt, R. W., 294  
Schmidt, S. F., 219, 220, 262, 376, 378  
Schmitz, F. H., 1775, 1797, 1830, 1831  
Schopf, J. W., 1512, 1530  
Schramm, V. L., 1531, 1532  
Schreiner, H. R., 1185  
Schroers, L. G., 152, 153, 200  
Schubert, F. H., 1284, 1300  
Schubert, G., 433, 434, 437, 438, 443, 444, 445, 500, 545, 728, 729, 732  
Schultz, P. H., 529  
Schwartz, H. R., 456  
Schwartz, I. R., 136, 137, 146, 433, 434

Schwartz, K., 437, 438, 443, 444, 445, 495, 545, 595, 728, 732  
Schwind, R. G., 295, 314  
Scott, B. C., 246  
Scully, M. P., 1813  
Sebesta, P. D., 1261, 1464  
Sedlacek, W. C., 1716, 1717  
Seebaugh, W. R., 39  
Seegmiller, H. L., 808, 826, 938  
Seeman, R., 322  
Seiff, A., 14, 1052  
Sellen, J. M., Jr., 1075  
Selman, J. R., 1295  
Seward, F. D., 709, 710  
Sexton, R. W., 1269  
Shaffer, R. G., 1715  
Shannon, J. H., 288  
Shapira, J., 1315, 1316, 1317, 1318, 1334, 1368, 1389, 1390, 1391, 1392,  
1393, 1404, 1405  
Sharp, R. P., 671  
Sharpe, D. L., 1816, 1817  
Shaw, S. A., 1632  
Sheaffer, Y., 767, 861  
Sheaffer, Y. S., 768, 769, 770, 862, 863, 911  
Shears, L. M., 1377  
Sheffield, C., 487  
Sheldahl, R. E., 852, 954  
Shelton, H., 1075  
Shen, B. S. P., 706  
Shen, W. -W., 894  
Shepard, C. E., 973  
Shepard, J. A., 1193  
Sherwood, B. R., 23  
Shevell, R. S., 1735, 1736  
Shillinger, G., Jr., 1126  
Shillinger, G. L., 1125  
Shillinger, G. L., Jr., 1122, 1124, 1127  
Shimabukuro, F., 1035  
Shipley, E. N., 663, 671  
Shitzer, A., 1258, 1394, 1409  
Shollenberger, C. A., 296  
Showman, R. D., 26  
Shute, D. I., 1649  
Siljak, D. D., 332, 333  
Sill, W. R., 524  
Silva, A. F., 783, 889  
Silver, L., 1546  
Silverman, M. P., 1490, 1515, 1533, 1586  
Simmonds, R. C., 1239  
Simmons, G., 497, 498  
Simpson, C., 1189  
Sims, J. S., 730, 731, 753, 755, 756  
Sinclair, K. F., 784, 1671, 1676, 1677, 1680, 1684  
Sinclair, S. R. M., 425

Singleton, R., Jr., 1577, 1587, 1588  
Singleton, R. E., 1774, 1823  
Sinner, E., 337  
Siopes, T. D., 1232  
Sissingh, G. J., 1790, 1791, 1793, 1817  
Skavdahl, H., 415  
Skrettingland, K., 380, 1630  
Slye, R. E., 1673, 1674, 1684  
Smart, W. H., 1406, 1407  
Smeltzer, D. B., 60, 69, 70, 139, 140  
Smith, B., 438  
Smith, B. A., 544, 663, 671, 701, 702, 724  
Smith, B. F., 443, 444, 445, 512, 728, 732  
Smith, C. L., 1678  
Smith, D., 243  
Smith, D. W., 244  
Smith, G. A., 1773  
Smith, G. L., 219, 220, 228, 245  
Smith, J., 1551, 1584  
Smith, K. R., Jr., 297, 319  
Smith, K. W., 89  
Smith, M., 786, 999  
Smith, P. H., 1505  
Smith, P. L., 848  
Smith, R. C., 138  
Smith, R. L., 1395  
Smith, S., 671  
Smith, Z. K., 598, 733  
Snetsinger, K. G., 734, 735, 736, 737, 738  
Snyder, C. T., 246, 247, 248  
Snyder, C. W., 606  
Snyder, M. F., 1187  
Soderblom, L. A., 671  
Soderman, P. T., 159, 160, 193, 249, 250, 251, 252, 305, 318  
Sokolsky, S., 298  
Solomon, H. L., 298, 1293, 1294  
Sommer, S. C., 14, 815, 1133  
Sonett, C. P., 431, 432, 437, 438, 439, 440, 441, 442, 443, 444, 445, 446,  
447, 448, 495, 497, 498, 499, 511, 512, 595, 728, 732  
Sorensen, N. E., 60, 69, 70, 97, 123, 139, 140, 141, 147  
Soule, V. H., 416, 417, 418  
South, F. E., 1396  
Souza, K. A., 1261, 1464, 1534, 1589  
Spangler, S. B., 282  
Spencer, N. W., 1052  
Spencer, R., 404  
Speyer, J. L., 294  
Spiker, I. K., 785  
Spittle, R., 391  
Spitzer, R. E., 413, 414, 419, 426  
Spreiter, J. R., 90, 91, 974  
Spyker, D. A., 1295  
St. John, G. A., 1022, 1024

Stackhouse, S. P., 1295  
Stahara, S. S., 90, 91, 543  
Staley, R. W., 1205, 1206, 1219  
Stallcop, J. R., 870, 871, 872, 998, 1056, 1057, 1058  
Stalling, D. L., 1480, 1481, 1482  
Stapleford, R. L., 420, 1288, 1289  
Starr, W. L., 739, 740  
Statler, I. O., 1777  
Steeger, E. J., 1710, 1711, 1712  
Stegall, H. F., 1398  
Steger, J. L., 120, 827, 860, 975, 976, 977  
Stein, J. E., 817, 1050  
Stein, S., 379  
Steinbacher, R. H., 536  
Steinmetz, C. P., 381  
Stepniewski, W. Z., 404, 1797, 1830, 1831  
Steunenberg, R. K., 1292  
Stewart, D., 786  
Stewart, D. A., 793, 796, 828, 829, 837, 924  
Stewart, E. C., 252, 319  
Stewart, J. D., 1319, 1320, 1321, 1322, 1323, 1397  
Stimpert, D. L., 299, 300  
Stine, H. A., 830, 982  
Stivers, L. S., Jr., 71  
Stöffler, D., 741, 742  
Stone, E. C., 1747  
Stone, H. L., 1198, 1199, 1220, 1221, 1222, 1398  
Stone, H. S., 1600  
Stout, E. G., 1720, 1737  
Strand, J. C., 1223  
Stratton, A. J., 1680  
Streed, E. R., 1171  
Stroub, R., 253  
Stroub, R. H., 193, 254  
Stucker, J. P., 1726  
Sturrock, D., 1355  
Suffolk, G. C. J., 556, 560, 565  
Sullivan, J. J., 20  
Sullivan, R. W., 1177  
Summers, A., 631, 699  
Summers, A. L., 618, 721  
Summers, J. L., 43  
Sung, M.-T., 469, 475, 476  
Suri, K. P., 1239  
Sutton, J. G., 1296, 1297  
Sutton, R. E., 953  
Sweeney, M., 1522  
Sweet, H. S., 1720  
Swenson, B. L., 1671, 1679, 1680, 1681, 1682  
Swerdling, B., 1103, 1170  
Swift, C. D., 5, 613, 709, 710, 743  
Sword, A. J., 1276  
Syberg, J., 82, 92

Symmes, N. J., 1535  
Syvertson, C. A., 18, 19, 21, 22

T.

Takahaski, A., 1378, 1397  
Taketa, S. T., 1259, 1400  
Takizawa, S., 1446  
Talarico, K. S., 1200, 1202, 1434, 1435, 1437  
Tambawala, H., 1405  
Tan, M., 1362  
Tannehill, J. C., 849, 978  
Tanner, C. S., 269, 301, 302  
Tanner, R. B., 1283  
Tarbox, F. C., 1571  
Tarn, T. J., 323, 356  
Tate, D. L., 835  
Tauber, M. E., 96, 1029  
Taylor, A., 1238  
Tempesta, F. L., 472, 687  
Templeton, G. H., 1637  
Tepper, E. H., 1296, 1297  
Tetelman, A. S., 1051  
Theumler, R., 1125  
Thomas, C. L., 48, 65, 72  
Thomas, N. C., 1104, 1105, 1140, 1141  
Thompson, G. A., 1179  
Thompson, T. W., 524  
Thorpe, T. E., 536  
Tindle, E. L., 784, 1679, 1680, 1681, 1683  
Tinling, B. E., 229  
Tobak, M., 979  
Tobias, L., 343, 357  
Tökosz, N., 1546  
Tomlinson, G. A., 1536, 1537  
Tompkins, J. E., 1781  
Tong, P., 1782, 1798  
Toon, O. B., 707, 744  
Toor, A., 710  
Tremor, J. W., 1239, 1261, 1464, 1465, 1589  
Treon, S. L., 31, 73  
Trulio, J. G., 93  
Tsugé, S., 107, 108, 142, 143  
Tucker, L., 1329  
Tucker, R., 724, 725  
Turco, R. P., 754, 755  
Turnbill, C., 1378, 1380, 1416, 1460, 1539  
Turnbill, C. E., 1239  
Tyson, B. J., 1485, 1590

U.

Uberto, B. P., 1275  
Udovich, N., 505  
Urkowitz, M., 1170



V.

Valero, F. P. J., 1038, 1059  
 Vallotton, W. C., 1402  
 van Beaumont, W., 1188, 1205, 1206, 1208, 1219, 1223, 1224, 1225, 1226, 1401  
 Van Buren, K. E., 461  
 Vanderplaats, G. N., 29, 74  
 VanDyke, M. D., 980  
 Van Flandern, T. C., 697  
 Van Kessel, A. L., 1338  
 Van Pelt, J. M., 1715  
 VanVleck, E. M., 1684, 1685, 1686  
 Vause, C. R., 1775  
 Vedder, J. F., 509, 570, 658, 668, 745, 746, 747  
 Velkoff, H. R., 1802  
 Vendell, E. E., 981  
 Vernikos-Danellis, J., 1180, 1181, 1195, 1196, 1197, 1227, 1228, 1229, 1230,  
 1231, 1233, 1234, 1236, 1426, 1430, 1432  
 Veverka, J., 544, 671, 690, 701, 702, 724, 725  
 Vicher, E. E., 1564  
 Viegas, J. R., 834  
 Vincenti, W. G., 99  
 Vishniac, W., 1173  
 Viskanta, V. Z., 1142  
 Viterbi, A. J., 1095, 1164, 1169  
 Vogel, F. S., 1239  
 Vohra, P., 1232  
 Vojvodich, N. S., 478, 795, 885, 905, 1123  
 Volk, L. J., 277  
 Vomaska, R. F., 389  
 Von Baumgarten, R., 1125  
 Von Baumgarten, R. J., 1122, 1124, 1126, 1127  
 von Bonin, G., 1463  
 Vorreiter, J. W., 835, 836, 982  
 Vykukal, H. C., 1333, 1402, 1424, 1425

W.

Wagmen, I. H., 1403  
 Wagner, R. A., 1799  
 Wagoner, R. V., 586  
 Wainwright, D. E., 1718  
 Wakefield, R. M., 837, 838, 983, 984, 985  
 Walitt, L., 93  
 Wallmark, G. N., 1135, 1136, 1708, 1709  
 Walsh, G. B., 1354  
 Walsh, T. M., 370  
 Wang, P., 1111  
 Ward, S. H., 524  
 Warder, R. C., Jr., 874  
 Ware, N. G., 666  
 Wark, D. A., 666  
 Warming, R. F., 803, 925, 926, 986

Warner, N., 232  
Warner, R. W., 530, 531  
Waters, M. H., 1675, 1744, 1748, 1755, 1758  
Watson, D., 244  
Watson, E. C., 39, 134  
Watts, G. A., 358, 359, 1793, 1800, 1801  
Wayne, J. E., Jr., 403  
Weaver, E. C., 549, 857, 858, 1535  
Webb, H. M., 303, 1689, 1713, 1732  
Webb, P., 1183  
Webbon, B. W., 1299  
Webster, D. L., 748, 749  
Wedekind, J., 521  
Weerkemp, A., 1591  
Weetall, H. H., 1393  
Wehmiller, J., 1567  
Wehrend, W. R., Jr., 26  
Wei, R. P., 1019, 1060  
Weibel, J., 1461  
Weiberg, J. A., 390, 423  
Weinberg, J. L., 1147  
Weinrich, M., 294  
Weir, D. H., 1298  
Weisbach, M. F., 590, 591, 987, 1061, 1062  
Weiss, A. H., 1404, 1405  
Weissbart, J., 1406, 1407  
Wempe, T., 1250, 1251, 1256, 1308  
Wentz, F. J., III, 1186  
Werner, M. W., 586  
West, J. B., 1408  
West, M. W., 23, 1538  
Westbrook, R., 1634  
Westbrook, R. M., 1221, 1387, 1633, 1635, 1636  
Weston, K. C., 910, 988  
Wheeler, A. J., 144  
Whitcomb, J. H., 750  
White, B., 505  
White, B. R., 508  
White, J. S., 255  
White, K. C., 26, 315  
White, K. P., III, 1106, 1107, 1108  
Whitehead, A. B., 536  
Whitehill, L., 703  
Whitfield, O., 1592  
Whiting, E. E., 14, 839, 853, 989, 990  
Whitten, R. C., 671, 731, 748, 749, 751, 752, 753, 754, 755, 756  
Wichmann, H., 1109, 1143  
Wick, B. H., 256  
Wilby, J. F., 78  
Wilcox, D. E., 110, 1678  
Wilcox, J. M., 432, 619, 620, 757  
Wilcox, P. R., 530, 531, 532, 533  
Wildenthal, K., 1637

Wildey, R. L., 663, 671  
Wilhelms, D. E., 671  
Wilhjelm, J., 619  
Wilhold, G. A., 111  
Wilke, C., 1266  
Wilkins, M. E., 1020, 1021  
Williams, B., 1634  
Williams, B. A., 1260, 1332, 1350, 1356, 1357, 1374, 1396, 1409, 1410, 1411,  
1412, 1413  
Williams, D. P., 818, 991, 992, 993, 1019, 1050, 1051, 1060, 1063, 1064, 1065  
Williams, E. V., 1009  
Williams, J., 1576  
Williams, J. L., 1299  
Williams, K. G., 1595  
Williams, L. J., 110, 1659, 1668, 1687, 1743  
Williamson, R. A., 1098, 1099  
Willoughby, R., 1261, 1464  
Wilson, J. H., 1725  
Wilson, K., 851  
Wilson, K. H., 850  
Wilson, T. A., 19  
Wilson, W. O., 1232  
Winget, C. M., 1180, 1181, 1191, 1212, 1217, 1230, 1231, 1232, 1233, 1234,  
1235, 1236, 1445, 1636  
Wingrove, R. C., 360, 361  
Winkler, E. L., 449  
Winter, D. L., 1239  
Witteborn, F. C., 613, 743  
Witteborn, F. S., 534  
Woeller, F., 1519  
Woeller, F. H., 1541  
Woese, C., 1527  
Wohl, B., 292  
Wolfe, J. H., 512, 535, 598, 651, 652, 678, 726  
Wong, N. D., 75, 76  
Wood, H. G., 1577  
Wood, J., 1546  
Wood, R. D., 784  
Woodruff, J. R., 77  
Woodward, H. T., 1053  
Woolley, G. F., 684  
Woolley, J. P., 543  
Worden, A. M., 551  
Worobel, R., 1738, 1739, 1740  
Wrigley, R., 717  
Wrigley, R. C., 758, 759  
Wu, J. C., 1776  
Wydeven, T., 1252, 1304, 1305, 1306, 1311, 1359, 1360, 1361, 1362, 1406, 1407,  
1414, 1420, 1421  
Wykes, J. H., 94  
Wynn, T. M., 1773  
Wynn, R. A., 1285, 1300, 1415

Y.

Yaggy, P. F., 1777, 1778  
Yagoda, H. P., 868  
Yates, W. G., 1428  
Yeh, T. T., 281  
Yin, S. K., 1785, 1787  
Yokoyama, K., 1131  
Yoshihara, H., 84  
Yoshikawa, K. K., 840, 994, 995  
Young, A. T., 663  
Young, C. H., 145  
Young, D. R., 1179, 1237  
Young, H. L., 1182, 1205, 1206, 1208, 1219, 1226, 1416, 1449, 1450, 1539  
Young, L. S., 1120, 1167  
Young, R. S., 1261, 1464, 1465, 1466, 1553, 1554  
Young, S., 1198  
Young, W., 455  
Younger, G. G., 1716, 1717  
Yuen, G. U., 1593  
Yusken, J., 1182  
Yusken, J. W., 1206, 1208

Z.

Zabinsky, J. M., 403  
Zaborsky, J., 323  
Zabower, H. R., 1130, 1155  
Zafonte, L., 1008  
Zahn, J. R., 1248, 1417  
Zaviantseff, V., 763  
Zeiger, R. J., 764  
Zeitman, B. B., 1451  
Zeldin, S., 294  
Zelenka, J. S., 524  
Zeman, W., 1239  
Zimmerman, N. B., 772, 773, 878  
Zumwalt, R. W., 1480, 1481, 1482, 1525  
Zurek, R. W., 664

**SECTION II**  
**LIMITED PUBLICATIONS**

July 1971 through December 1973

ADMINISTRATION DIRECTORATE

TECHNICAL INFORMATION DIVISION

FORMAL REPORTS

1. De Voto, H. J.  
Accessibility to Information in Technical Exhibits. Apr. 1973.  
NASA TM-X-62246 X73-77903

AERONAUTICS AND FLIGHT SYSTEMS DIRECTORATE

AERONAUTICS DIVISION

FORMAL REPORTS

2. Allen, C. Q.; and Clasen, D. J.  
Effects of an Externally Mounted Canopy on the Aerodynamic Characteristics of a Four-Engine Transport Airplane Model at Mach Numbers from 0.5 to 0.95. Jan. 1973.  
NASA TM-X-62221 X74-72872
3. Boltz, F. W.; and Pettis, W.  
Supersonic Aerodynamic Characteristics of a Canard Controlled Honest John Rocket. Dec. 1972.  
NASA TM-X-62209 X74-72012
4. Brownson, J. J.; Robinson, H. L.; Pearson, P. R.; and Whitcomb, M.  
Aerodynamic Characteristics of a Space Shuttle Booster With A Delta Wing and Canard (M = 0.6 to 2.0), March 1971 Tests. Aug. 1971.  
NASA TM-X-62048 X71-81415
5. Brownson, J. J.; Gallaher, W.; and Debevoise, J.  
Aerodynamic Characteristics of a Space Shuttle Booster With a Delta Wing and Canard (M = 0.6 to 2.0), May 1971 Tests. May 1972.  
NASA TM-X-62118 X72-76723
6. Brownson, J. J.; and Bell, D. E.  
Aerodynamic Characteristics of a Space Shuttle Booster with an Expendable Second Stage and Various Payloads (M = 0.6 to 2.0), March 1971 Tests. Feb. 1972.  
NASA TM-X-62059 X72-75258
7. Brownson, J. J.; Miller, R. M.; and Houser, J.  
Aerodynamic Characteristics of a Space Shuttle Booster with Straight Wing and Horizontal Tail (Mach = .26 to 2.0). Mar. 1972.  
NASA TM-X-62115 X72-74391
8. Brownson, J. J.; Jarrett, T. W.; and Jensen, T. L.  
Aerodynamic Characteristics of a Space Shuttle Launch Configuration Consisting of a Delta-Wing Orbiter and Booster with Canard, Aft Swept Wing, and Tip Fins (M = 0.6 to 2.0). Vol. I. Composite Configuration. Dec. 1972.  
NASA TM-X-62070 X73-70719

9. Brownson, J. J.; Jarrett, T. W.; and Jensen, T. L.  
Aerodynamic Characteristics of a Space Shuttle Launch Configuration  
Consisting of a Delta-Wing Orbiter and a Booster with Canard, Aft  
Swept Wing and Tip Fins (M = 0.6 to 2.0). Vol. II. Orbiter and  
Booster in the Presence of Each Other. Dec. 1972.  
NASA TM-X-62071 X73-71115
10. Brownson, J. J.; Dresser, H. S.; and Cameron, B.  
Aerodynamic Characteristics of a Space Shuttle Launch Configuration  
Consisting of a Delta Wing Orbiter and Delta Wing Booster (M = 0.6  
to 2.0). Jan. 1971.  
NASA TM-X-62063 X73-70718
11. Brownson, J. J.; Tessitore, F. T.; and Quan, M.  
Aerodynamic Characteristics of a Space Shuttle Launch Configuration  
Consisting of a Delta Wing Orbiter with External Hydrogen Tanks and  
a Straight Wing Booster (M = 0.6 to 2.0). Dec. 1971.  
NASA TM-X-62061 X72-72229
12. Brownson, J. J.; Whitnah, A. M.; Kassner, D. L.; and Rampy, J.  
Aerodynamic Characteristics of an O40A Space Shuttle Launch Configura-  
tion with Simulated Rocket Plumes at Mach Numbers from 0.8 to 2.2.  
Sept. 1972.  
NASA TM-X-62126 X73-70377
13. Brownson, J. J.; and Whitnah, A. M.  
Aerodynamic Characteristics of the Manned Spacecraft Center Space  
Shuttle Launch Configuration Orbiter/Booster Interference Effects  
(M = 0.6 to 2.0). Sept. 1972.  
NASA TM-X-62069 X73-70210
14. Brownson, J. J.; Quan, M.; and Jung, W.  
Aerodynamic Characteristics of Two Delta Wing Space Shuttle Orbiters  
With and Without External Hydrogen Tanks (M = 0.3 to 2.0). Dec.  
1971.  
NASA TM-X-62060 X72-72233
15. Brownson, J. J.; Fossler, I. H.; Harrin, E. N.; and Olsen, D. C.  
Aerodynamic Stability and Control Characteristics of the MSC O40-A  
Orbiter with Variations of Body, Wing, Vertical Tail and Canopy (M =  
0.6 to 2.0). Feb. 1972.  
NASA TM-X-62112 X72-74541
16. Brownson, J. J.; and Whitnah, A. M.  
Determination of Drag, Stability and Control Characteristics for the  
Manned Spacecraft Center Launch Configuration (Straight Wings).  
Oct. 1972.  
NASA TM-X-62072 X73-70211



17. Brownson, J. J.; Whitnah, M. A.; Gross, A. R.; and Chambliss, E. B.  
Effects of Reynolds Number on the Aerodynamic Stability and Control  
Characteristics of the Manned Spacecraft Center Class 040 Space  
Shuttle Orbiter at Mach Numbers of 0.6 to 1.2. Apr. 1972.  
NASA TM-X-62120 X72-75865
  
18. Brownson, J. J.; Tessitore, F.; and Quan, M.  
Forces, Moments, and Pressures on Various External Liquid Hydrogen  
Tanks Mounted on a Booster/Orbiter Mated Launch Configuration.  
Jan. 1972.  
NASA TM-X-62062 X72-72339
  
19. Dods, J. B., Jr.; and Cangie, C. D.  
Flow Visualization Studies of Three Space Shuttle Launch Configurations  
at Mach Numbers from 0.8 to 2.0. Sept. 1971.  
NASA TM-X-62074 X72-71169
  
20. Fahey, R. E.; Scher, S. H.; and McGrath, J. T.  
High Attitude Static Aerodynamic Characteristics of a Straight-Wing  
Twin-Jet Subsonic Airplane. Jan. 1973.  
NASA TM-X-62220 X74-72103
  
21. Fahey, R. E.; and Clasen, D. J.  
Horizontal-Tail Effectiveness of a Twin-Engine Aircraft Configuration  
with Twin Vertical Tails and Aft Fuselage Mounted Nacelles. Oct. 1972.  
NASA TM-X-62192 X74-72101
  
22. Gross, A. R.; and Merrill, S. W.  
Evaluation of a Five-Hole Hemispherical Yaw Meter Probe at Mach  
Numbers from 0.3 to 0.7. Feb. 1973.  
NASA TM-X-62215 X74-72878
  
23. Hedstrom, C. E.; and Sapp, O. L.  
Static Aerodynamic Characteristics of a Low-Fineness-Ratio Cylinder  
at Angles of Attack to 90° for Mach Numbers from 0.6 to 1.8.  
Sept. 1973.  
NASA TM-X-62301 X74-72100
  
24. Hicks, R. M.; and Mendoza, J. P.  
A Brief Study of the Space Shuttle Sonic Boom During Ascent. Aug. 1971.  
NASA TM-X-62050 X71-79173
  
25. Hicks, R. M.; Levy, L. L., Jr.; and Mendoza, J. P.  
An Investigation of Sonic Boom for Straight Wing and Delta Wing  
Space Shuttle Orbiters. Apr. 1971.  
NASA TM-X-62030 X71-77873

26. Hicks, R. M.; and Mendoza, J. P.  
Wind Tunnel Pressure Signatures for a Delta Wing Space Shuttle Vehicle. Aug. 1971.  
NASA TM-X-62040 X71-80312
  
27. Hicks, R. M.; and Mendoza, J. P.  
Wind Tunnel Pressure Signatures for a Delta Wing Space Shuttle Vehicle and a Space Shuttle Fuel Tank. Apr. 1972.  
NASA TM-X-62119 X72-76670
  
28. Hofstetter, W. R.; and Barringer, T. D.  
Static Stability and Axial Force Characteristics of a Ballute Stabilized Terminal Guidance Sub-Missile Configuration for Mach Numbers from 0.60 to 1.10. Dec. 1972.  
NASA TM-X-62213 X74-72102
  
29. Hopkins, E. J.; Meriwether, F. D.; and Pena, D. E.  
Experimental Aerodynamic Characteristics of Low-Aspect Ratio Swept and Oblique Wings at Mach Numbers Between 0.6 and 1.4. Nov. 1973.  
NASA TM-X-62317 X74-72874
  
30. Kassner, D. L.; and Clasen, D. J.  
An Investigation of Missile Fin Interference Effects at Mach Numbers from 0.49 to 1.40 (U). Dec. 1972.  
NASA TM-X-62202 X74-72830
  
31. Kauffman, R. C.; and Cohen, L. E.  
Static Aerodynamic Characteristics of a 0.036-Scale Model of the B-1 Airplane at Angles of Attack from  $-5^\circ$  to  $90^\circ$  for a Mach Number of 0.23. Apr. 1973.  
NASA TM-X-62255 X74-72873
  
32. Levin, A. D.; and Petroff, D. N.  
An Experimental Investigation of Single- and Double-Hinged Leading-Edge Flaps on a Model of an F-5A Aircraft at Transonic Mach Numbers. Jan. 1972.  
NASA TM-X-62095 X72-74378
  
33. Murphy, J. D.; Davies, C. B.  
Users Guide: Ames Inlet Boundary Layer Program MK I. Jan 1973.  
NASA TM-X-62211 X73-70720
  
34. Radcliff, H. D.; and Castellano, C. R.  
Experimental Investigation of a Long Range,  $M = 0.95$  Advanced Technology Transport Design with Four Wing-Mounted Engines (U). May 1973.  
NASA TM-X-62214 X74-73508

35. Steckel, D. K.; and Jorgensen, L. H.  
A Comparison of the Aerodynamic Characteristics of a Conventional  
and a Supercritical Wing Designed to the Same High Subsonic Cruise  
and Buffet-Onset Goals (U). Oct. 1973.  
NASA TM-X-2898 X73-10537
36. Steinle, F. W., Jr.; and Cangie, C. D.  
Lateral and Directional Stability and Control Characteristics of a  
Delta Wing Fighter Model with an Aft Horizontal Tail and Wing  
Mounted Missiles at Mach Numbers from 0.6 to 1.6 (U). June 1972.  
NASA TM-X-62161 X74-70845
37. Steinle, F. W., Jr.; and McGrath, J. T.  
Longitudinal, Lateral and Directional Stability and Control Character-  
istics of a Twin-Engine Interceptor Aircraft Model with Wing-Mounted  
Missiles at Mach Numbers from 0.6 to 1.7 (U). Jan. 1973.  
NASA TM-X-62205 X74-72833
38. Steinle, F. W., Jr.; and Cangie, C. D.  
Static Aerodynamic Characteristics of a Cruciform-Finned Missile Model  
with Canard Controls at Mach Numbers from 0.6 to 1.9 (U). Feb. 1973.  
NASA TM-X-62212 X74-70846
39. Steinle, F. W., Jr.; and Sihvonen, A. E.  
Static Aerodynamic Characteristics of a Cruciform-Winged Missile with  
Interdigitated Tubular Protuberances at Mach Numbers from 0.6 to 2.2  
(U). Jan. 1973.  
NASA TM-X-62219 X74-72831
40. Steinle, F. W., Jr.; and Stone, J. S.  
Static Aerodynamic Characteristics of a Twin-Engine Aircraft Model with  
Aft Fuselage Mounted Nacelles at Mach Numbers from 0.6 to 1.6 (U).  
Jan. 1973.  
NASA TM-X-62216 X74-72829
41. Steinle, F. W., Jr.; and Whitcomb, W. M., Jr.  
Static Stability and Control Characteristics of a High Volume Missile  
at Mach Numbers from 0.6 to 1.5 (U). Dec. 1972.  
NASA TM-X-62206 X74-72832
42. Steinle, F. W., Jr.; and Whitcomb, W. M., Jr.  
Static Stability and Control Characteristics of a Twin-Nacelle Inter-  
ceptor Aircraft Model Wing-Mounted Missiles at Mach Numbers from 0.6  
to 1.6 (U). Dec. 1972.  
NASA TM-X-62210 X74-72835
43. Steinle, F. W., Jr.; and Cangie, C. D.  
Static Stability and Control Characteristics of a Variable-Sweep Twin-  
Engine Aircraft Model with Side Inlets and Aft Horizontal Tail at Mach  
Numbers from 0.6 to 1.6 (U). Feb. 1973.  
NASA TM-X-62204 X74-72834

44. Stoddart, S. A.; Radcliff, H. D.; and Wettlaufer, B. M.  
Static Aerodynamic Characteristics of a 0.20-Scale Model of the XQM-103 (FDL-23) Research Test Vehicle for a Mach Number Range of 0.5 to 0.9. Nov. 1973.  
NASA TM-X-62316 X74-72011

NASA CONTRACTOR REPORTS

45. Sorensen, N. E.; Smeltzer, D. B.; and Latham, E. A.  
Advanced Supersonic Inlet Technology. In Johns Hopkins University. Applied Physics Laboratory, Silver Spring, Md. The 1972 JANNAF Propulsion Meeting, Aircraft Propulsion Sessions, New Orleans, Nov. 27-29, 1972. (Chemical Propulsion Information Agency Publication no. 232), p. 247-259.  
(CPIA-PUBL-232, N00017-72-C-4401, Applied Physics Lab., Johns Hopkins Univ., Silver Spring, Md.) Dec. 1972.  
NASA-CR-128017 (Confidential) X73-75099

FLIGHT SYSTEMS RESEARCH DIVISION

FORMAL REPORTS

46. Feistel, T. W.; Maki, R. L.; and Tolhurst, W. H., Jr.  
Low Speed Wind Tunnel Tests of a 3/4 Scale Unpowered Fighter Model  
with 45° Swept Wings, In and Out of Ground Effect (U). Sept. 1971.  
NASA TM-X-62084 X72-77901
47. Gregg, L. E.; Tolhurst, W. H., Jr.; and Maki, R. L.  
Low-Speed Wind Tunnel Tests in Ground Effect of a 3/4 Scale Powered  
Fighter Model with 45° Swept Wings (U). Dec. 1973.  
NASA TM-X-62328 X74-72836
48. Gregg, L. E.; Tolhurst, W. H., Jr.; and Maki, R. L.  
Low Speed Wind Tunnel Tests of a 3/4 Scale Powered Fighter Model with  
45° Swept Wings (U). Oct. 1972.  
NASA TM-X-62177 X73-78746
49. Hickey, D. H.; Soderman, P. T.; and Kelly, M. W.  
Noise Measurements in Wind Tunnels. 1972.  
NASA TM-X-68360 X72-76742
50. Maki, R. L.; Tolhurst, W. H., Jr.; and Eckert, W. T.  
Low Speed Wind Tunnel Tests of the Effects of Various Configuration  
Changes on a 3/4 Scale Unpowered Fighter Model with 45° Swept Wings  
(U). May 1972.  
NASA TM-X-62140 X72-78732
51. Maki, R. L.; Tolhurst, W. H., Jr.; and Gregg, L. E.  
Low Speed Wind Tunnel Tests of the Lateral-Directional Stability of  
a 3/4 Scale Fighter Model with 45° Swept Wings at High Angles of  
Attack (U). Feb. 1973.  
NASA TM-X-62178 X73-78747
52. Robinson, G. G.; Lane, J. W.; and Bondi, M. J.  
Flight Measurements of Range Utilizing the Ames Precision Range  
System and the Advanced Range and Orbit Determination System.  
Apr. 1972.  
NASA TM-X-62147 X72-74392
53. Stevens, V. C.; McNeill, W. E.; and Drinkwell, F. J.  
Preliminary Results of a Piloted Simulator Study of Carrier Landing  
Approaches. July 1971.  
NASA TM-X-62080 X72-10533

NASA CONTRACTOR REPORTS

54. Abramson, R.  
Lift Fan V/STOL Flight Control Systems Development. Vol. 2.  
Simulation Experiment. (North American Rockwell Corp., Los Angeles,  
Calif.; NAS2-6564.) June 18, 1973. X73-10469  
NASA CR-114585
55. Anon.  
Noise Refractors Study: Final Report. (Mayer (A.) and Associates,  
Sunnyvale, Calif.; NAS2-6965.) Oct. 1972. X72-82565  
NASA CR-114512
56. Campbell, J. M.; Lawrence, R. L.; and O'Keefe, J. V.  
Design Integration and Noise Studies for Jet STOL Aircraft. Vol. 3.  
Static Test Program. Final Report. (D6-40552-3-VOL-3, Boeing Co.,  
Seattle, Wash.; NAS2-6344.) May 1972. X72-10361  
NASA CR-114473
57. Hackett, J. E.; Praytor, E. B.; and Caldwell, E. O.  
Ground Effect for V/STOL Aircraft Configurations and its Simulation  
in the Wind Tunnel. Part 3. The Tangentially Blown Ground as an  
Alternative to a Moving Ground: Application to the NASA Ames 40-  
by 80-Foot Wind Tunnel. (Lockheed-Georgia Co., Marietta; NAS2-6690.)  
1972. X72-82656  
NASA CR-114497
58. Roepcke, F. A.; and Kelley, G. S.  
Design Integration and Noise Studies for Jet STOL Aircraft. Vol. 2.  
System design and Evaluation Studies. Final Report. (D6-40552-VOL-2,  
Boeing Co., Seattle, Wash.; NAS2-6344.) May 1972. X72-10360  
NASA CR-114472
59. Wang, T.; Wright, F; and Mahal, A.  
Design Integration and Noise Studies for Jet STOL Aircraft. Vol. 4.  
Wind Tunnel Test Program. Final Report. (D6-40552-4-VOL-4, Boeing  
Co., Seattle, Wash.; NAS2-6344.) May 1972. X72-10362  
NASA CR-114474

QUIET PROPULSIVE LIFT AIRCRAFT TECHNOLOGY

NASA CONTRACTOR REPORTS

60. Currie, J. W., Jr.  
Design Studies of Low Cost Propulsive Lift Aircraft. (LG73-ER0055,  
Lockheed-Georgia, Co., Marietta; NAS2-7300.) June 1973.  
NASA CR-114651 X73-10432
61. Searle, N.  
NASA QUESTOL 1/5 Scale Model Propulsion/Acoustic Test Results. Vol. 2.  
Acoustics. (LG73-ER0041-VOL-2, Lockheed-Georgia Co., Marietta; NAS2-  
7300.) Mar. 1973.  
NASA CR-114653 X73-10434
62. Shumpert, P. K.  
NASA QUESTOL 1/5 Scale Model Propulsion/Acoustic Test Results. Vol. 1.  
Propulsion. (LG73-ER0041-VOL-1, Lockheed-Georgia Co., Marietta; NAS2-  
7300.) Mar. 1973.  
NASA CR-114652 X73-10433

SIMULATION SCIENCES DIVISION

NASA CONTRACTOR REPORTS

63. Brain, A. E.  
Increasing the Dynamic Range of Visual Simulation By Means of a  
Flying-Spot Scanner. Final Report. (Stanford Research Inst., Menlo  
Park, Calif.; NAS2-5535.) May 1972. X72-10375  
NASA CR-114477



V/STOL PROJECTS OFFICE

NASA CONTRACTOR REPORTS

64. Abramson, R.; and Campbell, J. E.  
Lift Fan V/STOL Flight Control Systems Development. Vol. 1. Flight Controls Analysis. (North American Rockwell Corp., Los Angeles, Calif.; NAS2-6564.) Nov. 1972.  
NASA CR-114584 X73-10468
65. Abramson, R.  
Lift Fan V/STOL Flight Control Systems Development. Vol. 3. Flight Simulation Model. (North American Rockwell Corp., Los Angeles, Calif.; NAS2-6564.) Dec. 1972.  
NASA CR-114586 X73-10470
66. Anon.  
Advanced Energy Transfer Control Ducting Investigation. (MDC-A1828, McDonnell Aircraft Co., St. Louis, Mo.; NAS2-5499.) Aug. 17, 1972.  
NASA CR-114539 X73-10150
67. Anon.  
Conceptual Design Studies of Candidate V/STOL Lift-Fan Research Transport. Part 1, Task 1. Final Report. (D6-40215-PT-1, Boeing Co., Renton, Wash.; NAS2-6563.) Oct. 28, 1971.  
NASA CR-114548 X73-71110
68. Anon.  
Design Study of V/STOL Lift Fan Research Transport. Vol. 1, Part 1, Task 2. Final Report. (D6-22523-VOL-1-PT-1, Boeing Co., Renton, Wash.; NAS2-6563.) May 30, 1972.  
NASA CR-114549 X73-74505
69. Anon.  
A Full Scale Test of a New V/STOL Control System Energy Transfer Control (Etc). (MDC-A1588, McDonnell Aircraft Co., St. Louis, Mo.; NAS2-5499.) June 15, 1972.  
NASA CR-114541 X73-10104
70. Anon.  
A Full Scale Test of a New V/STOL Control System Energy Transfer Control (Etc). Phase 2. Engine Out Operation. (MDC-A1588-SUPPL-1, McDonnell-Douglas Corp., St. Louis, Mo.; NAS2-5499.) Apr. 1973.  
NASA CR-114596 X73-10268
71. Anon.  
Lift Van V/STOL Transport Flight Control System Development Continuation. Vol. 1. Interim Simulation Experiment. (MDC-A1749-VOL-1, McDonnell Aircraft Co., St. Louis, Mo.; NAS2-5499.) July 24, 1972.  
NASA CR-114540 X73-10103

72. Anon.  
Lift Fan V/STOL Transport Flight Control System Development Continuation. Vol. 2. Analytical Studies and Display Development. (MDC-A1749, McDonnell Aircraft Co., St. Louis, Mo.; NAS2-5499.) Sept. 15, 1973.  
NASA CR-114643 X73-10471
73. Anon.  
Lift Fan V/STOL Transport Flight Control System Investigation. Phase 2. Moving Base Simulation. (MDC-A1496, McDonnell Aircraft Co., St. Louis, Mo.; NAS2-5499.) Nov. 30, 1971.  
NASA CR-114529 X73-10075
74. Anon.  
Near Term V/STOL Lift Fan Research Transport Update. Vol. 1. Technical Data. (MDC-A1602, McDonnell-Douglas Corp., St. Louis, Mo.; NAS2-5499.) July 15, 1972.  
NASA CR-114537 X73-71111
75. Anon.  
Study of a Near-Term V/STOL Lift Fan Research Transport. Vol. 1. (NA-72-444-VOL-1, North American Rockwell Corp., Los Angeles, Calif.; NAS2-6564.) July 14, 1972.  
NASA CR-114542 X73-71112
76. Anon.  
V/STOL Tilt Rotor Aircraft Study. Vol. 3. Overall Research Aircraft Project Plan Schedules and Estimated Cost. (D222-10016-3, Boeing Co., Philadelphia, Pa.; NAS2-6598.) Mar. 1972.  
NASA CR-114439 X73-10264
77. Anon.  
V/STOL Tilt Rotor Aircraft Study. Vol. 4. Wind Tunnel Investigation Plan for a Full Scale Tilt Rotor Research Aircraft. (D222-10016-4, Boeing Co., Philadelphia, Pa.; NAS2-6598.) Mar. 1972.  
NASA CR-114440 X73-10265
78. Anon.  
V/STOL Tilt-Rotor Study, Task 2. Vol. 3. Research Aircraft Project Plan. (REPT-300-099-007-VOL-3, Bell Helicopter Co., Fort Worth, Tex.; NAS2-6599.) 1972.  
NASA CR-114443 X73-10266
79. Anon.  
V/STOL Tilt-Rotor Study, Task 4. Vol. 4. Wind Tunnel Investigation Plan. (REPT-300-099-008, Bell Helicopter Co., Fort Worth, Tex.; NAS2-6599.) 1972.  
NASA CR-114444 X73-10267

80. Bosch, J. C.; Campbell, J. M.; and O'Keefe, J. V.  
Noise Estimates for a Family of Four-Engine Augmentor Wing STOL  
Airplanes. (D6-41180, Boeing Commercial Airplane Co., Seattle,  
Wash.; NAS2-16344.) Oct. 1973.  
NASA CR-114633 X74-10017
81. Campbell, J. M.; Harkonen, D. L.; Lawrence, R. L.; and O'Keefe, J. V.  
Design Integration and Noise Studies for Jet STOL Aircraft: Noise  
Suppression of Improved Augmentors for Jet STOL Aircraft. Task 5,  
Interim Report. (D6-60174, Boeing Co., Seattle, Wash.; NAS2-6344.)  
Jan. 1973.  
NASA CR-114534 X73-10152
82. Eldridge, W. M.; Lambregts, A. A.; and Spitzer, R. E.  
Piloted Simulation of the Boeing Model R984-33 V/STOL Research Air-  
craft. Vol. 1. Analysis of the Flight Control System and Flight  
Characteristics. (D6-40876, BR796431; NAS2-6563.) Feb. 1973.  
NASA CR-114557 X73-10308
83. Eldridge, W. M.; Lambregts, A. A.; and Spitzer, R. E.  
Piloted Simulation of the Boeing Model R984-33 V/STOL Research Air-  
craft. Vol. 2. Results of Piloted Simulation. (D6-40932, BR796431;  
NAS2-6563.) Feb. 1973.  
NASA CR-114558 X73-10309
84. Eldridge, W. M.; Lambregts, A. A.; and Spitzer, R. E.  
Piloted Simulation of the Boeing Model R984-33 V/STOL Research Air-  
craft. Vol. 3. Simulator Specification, Checkout, and Test Plan.  
(D6-42106-VOL-3, Boeing Commercial Airplane Co., Renton, Wash.;  
NAS2-6563.) Feb. 1973.  
NASA CR-114559 X73-72312
85. Goebel, T. P.  
Wind Tunnel Data Analysis for the NR/VTOL 0.06 Scale Model. (NA-72-  
17-2, North American Rockwell Corp., Los Angeles, Calif.; NAS2-6642.)  
Oct. 31, 1972.  
NASA CR-114544 X73-73522

ASTRONAUTICS DIRECTORATE

SPACE SCIENCE DIVISION

FORMAL REPORTS

86. Billman, K. W., Editor.  
Lazer-Energy Conversion Symposium, 1973.  
NASA TM-X-62269 X74-70741
87. Cleary, J. W.  
Hypersonic Lateral and Directional Stability Characteristics of a  
Delta-Wing Orbiter with Body-Mounted Twin Tails. Feb. 1973.  
NASA TM-X-62125 X73-75466
88. Cleary, J. W.  
Hypersonic Shock-Wave Phenomena of a Delta-Wing Space Shuttle Orbiter.  
Oct. 28, 1971.  
NASA TM-X-62076 X71-85380
89. Goldman, C. R.; Richards, R. C.; Paerl, H. W.; Wrigley, R. C.;  
Oberbeck, V. R.; and Quaide, W. L.  
Aquatic Studies and Remote Sensing of the Upper Truckee River Sedi-  
ment Plume in Lake Tahoe. Feb. 1973.  
NASA TM-X-62238 X73-72810
90. McDevitt, J. B.; and Mellenthin, J. A.  
Hypersonic Aerodynamic Characteristics of a Delta Body Space Shuttle  
Orbiter. May 1971.  
NASA TM-X-62034 X71-77896
91. Watson, V. R.; and Viegas, J. R.  
Preliminary Evaluation of Atmosphere Pollution by Reentry of a Space  
Shuttle Vehicle. Feb. 1973.  
NASA TM-X-62130 X73-75467

NASA CONTRACTOR REPORTS

92. Intriligator, D. S.  
Ion Electron Optimization Study. Final Report, 6 Jan. - 31 Aug.  
1972. (California Inst. of Tech., Pasadena; NAS2-6740; NGR-05-002-  
259.) Aug. 31, 1972.  
NASA CR-114509 X72-82566
93. Oilye, R. G.; and Stokowski, S. E.  
Monitoring Atmospheric Pollutants. (Martin Marietta Labs., Baltimore,  
Md.; NAS2-7162.) Aug. 31, 1973.  
NASA CR-114662 X73-10495

THERMO- AND GAS DYNAMICS DIVISION

FORMAL REPORTS

94. Billman, K. W.  
Laser-Energy Conversion Symposium. Sept. 1973.  
NASA TM-X-62269 X74-70741
95. Cleary, J. W.  
Hypersonic Lateral and Directional Stability Characteristics of a  
Delta-Wing Orbiter with Body-Mounted Twin Tails. Feb. 1973.  
NASA TM-X-62125 X73-75466
96. Cleary, J. W.  
Hypersonic Shock Wave Phenomena of a Delta Wing Space Shuttle Orbiter.  
Oct. 1971.  
NASA TM-X-62076 X71-85380
97. Cleary, J. W.  
Hypersonic Stability and Control Characteristics of a Straight-Wing  
Space Shuttle Orbiter. Jan. 1971.  
NASA TM-X-62068 X71-81446
98. Cleveland, W. B.; Vomaske, R. F.; and Sinclair, S. R. M.  
Augmentor Wing Jet STOL Research Aircraft Digital Simulation Model.  
Apr. 1972.  
NASA TM-X-62149 X72-75558
99. Lockman, W. K.; and DeRose, C. E.  
Aerodynamic Heating of a Space Shuttle Straight-Wing Orbiter. Dec.  
1971.  
NASA TM-X-62078 X72-72231
100. McDevitt, J. B.; and Mellenthin, J. A.  
Hypersonic Aerodynamic Characteristics of a Delta Body Space Shuttle  
Orbiter. May 1971.  
NASA TM-X-62034 X71-77896
101. Mellenthin, J. A.; Tessitore, F.; and Quan, M.  
Aerodynamic Characteristics of a Delta-Wing Orbiter and Straight-  
Wing Booster Space-Shuttle-Launch Vehicle for Mach Numbers from  
0.25 to 2.0. Apr. 1972.  
NASA TM-X-62109 X72-75830
102. Mellenthin, J. A.; Hamilton, R. K.; and Zoerner, G. D.  
Aerodynamic Force Characteristics and Oil Flow Studies of a Delta  
Winged Space Shuttle Orbiter. Dec. 1971.  
NASA TM-X-62108 X72-71176

103. Mellenthin, J. A.; and Cameron, B. W., Jr.  
Pressure Tests of Models of a Straight Wing Orbiter, Delta-Wing  
Orbiter, and a Straight Wing Booster (Mach Number 0.6 to 2.2). Vol.  
1. Straight Wing Booster. July 1972.  
NASA TM-X-62121 X73-70136
104. Mellenthin, J. A.; Cameron, B. W., Jr.; and Leef, C. R.  
Pressure Tests of Models of a Straight Wing Orbiter, Delta-Wing  
Orbiter, and a Straight Wing Booster (Mach Number 0.6 to 2.2). Vol.  
2. Delta Wing Orbiter. July 1972.  
NASA TM-X-62127 X72-82552
105. Mellenthin, J. A.; Cameron, B. W., Jr.; and Leef, C. R.  
Pressure Tests of Models of a Straight Wing Orbiter, Delta Wing  
Orbiter, and a Straight Wing Booster (Mach Number 0.6 to 2.2). Vol.  
3. Straight Wing Orbiter. July 1972.  
NASA TM-X-62128 X72-82553
106. Pappas, C. C.  
Windward Body Surface Study for Laminar Heating of Space Shuttle  
Vehicles at High Angle of Attack. Oct. 1971.  
NASA TM-X-62075 X71-85381
107. Rajapakse, Y. D. S.  
Surface Energy and Surface Tension at Holes and Cracks. July 1973.  
NASA TM-X-62277 X73-77915

VEHICLES ENVIRONMENT DIVISION

FORMAL REPORTS

108. Ciffone, D. L.; and Sarver, D.  
Transonic/Supersonic Aerodynamic Characteristics and Control  
Effectiveness of Proposed High-Wing Single-Body Canard SSV Booster  
Vehicle. Aug. 1971  
NASA TM-X-62049 X71-79867
109. DeRose, C. E.; and Lockman, W. K.  
Aerodynamic Heating of a Space Shuttle Straight Wing Booster at Mach  
Number 7.4. Dec. 1971.  
NASA TM-X-62077 X72-72230
110. Intrieri, P. F.  
Aerodynamic Characteristics of a Space Shuttle Delta-Wing Orbiter at  
Mach Numbers from 0.6 to 2.0. June 1971.  
NASA TM-X-62042 X71-77927
111. Malcolm, G. N.  
Aerodynamic Characteristics of a Space Shuttle Delta-Wing Orbiter at  
Mach Numbers from 0.25 to 2.0. June 1971.  
NASA TM-X-62044 X71-78246
112. Malcolm, G. N.  
Aerodynamic Characteristics of a Space Shuttle Straight-Wing Orbiter at  
Mach Numbers from 0.25 to 2.0. June 1971.  
NASA TM-X-62045 X71-78234

DEVELOPMENT DIRECTORATE

FORMAL REPORTS

113. Gideon, W.  
Life Test of Mercury Batteries. Apr. 12, 1972.  
NASA TM-X-69256

X73-75549



ADVANCE SPACE PROJECTS OFFICE

NASA CONTRACTOR REPORTS

114. Anon.  
Feasibility Study for a Multi-Mission Electric Propulsion Spacecraft  
(Pioneer Concept). Final Report. (TRW-18305-6001-R0-00, TRW Systems  
Group, Redondo Beach, Calif.; NAS2-6287.) June 18, 1971.  
NASA CR-114353 X71-79598

FLIGHT PROJECT DEVELOPMENT DIVISION

NASA CONTRACTOR REPORTS

115. Biraben, P.; Pettengill, G. H.; and Shapiro, I. I.  
Analysis of the Potential of Differential Very-Long Baseline-  
Interferometry, (DVLBI) for Tracking Venus Entry Probes to Infer  
Wind Speeds in the Planet's Lower Atmosphere. Final Report.  
(Massachusetts Inst. of Tech., Cambridge; NAS2-7648.) Dec. 1973.  
NASA CR-114747 X74-10113
116. Croft, T. A.; Eshleman, V. R.; Marouf, E. A.; and Tyler, G. L.  
Preliminary Review and Analysis of Effects of the Atmosphere of  
Venus on Radio Telemetry and Tracking of Entry Probes. Final Report.  
(Stanford Univ., Calif.; NAS2-7126.) Oct. 1972.  
NASA CR-114692 X74-10049
117. Goldfischer, L. I.  
Venus Wind Altitude Radar Study. Phase 2. Final Report. (Y258A109,  
Singer-Kearfott, Little Falls, N. J.; NAS2-7255.) Nov. 1973.  
NASA CR-114676 X74-10063
118. Shinn, J. N.; and Honda, T.  
Study of an Augmented Fluidic Thruster for VTOL Aircraft Stabilization.  
(General Electric Co., Schenectady, N. Y.; NAS2-5467.) Mar. 1972.  
NASA CR-114587 X74-10016

PROJECT PIONEER

FORMAL REPORTS

119. Anon.  
NASA Parts Reliability Activities. Presented at the 1972 Annual Symposium on Reliability and Maintainability, NASA, Ames Research Center, Moffett Field, Calif., Jan. 25, 1972.  
NASA TM-X-68978 X73-70220

NASA CONTRACTOR REPORTS

120. Anon.  
Infrared Radiometer for the Pioneer F/G Asteroid-Jupiter Missions. Final Technical Report. (Santa Barbara Research Center, Goleta, Calif.; NAS2-5607.) Apr. 26, 1973.  
NASA CR-114659 X73-78169
121. Goldfischer, L. I.  
Venus Wind Altitude Radar Study, Phase 2. Final Report. (Y258A109, Singer-Kearfott, Little Falls, N. J.; NAS2-7255.) Nov. 1973.  
NASA CR-114676 X74-10063

RELIABILITY AND QUALITY ASSURANCE OFFICE

FORMAL REPORTS

122. Karpen, R. C.  
Pioneer Jupiter Scientific Instruments Parts Screening Report.  
Sept. 29, 1972.  
NASA TM-X-70054

X74-74301

SYSTEMS ENGINEERING DIVISION

NASA CONTRACTOR REPORTS

123. Anon  
Digital Data Communication Link Study. Final Report. (SCG-20073R  
REF-72(44)-07400/C6255, Hughes Aircraft Co., El Segundo, Calif.;  
NAS2-6801.) Feb. 1972.  
NASA CR-114451 X72-74940
124. Pace, N.; Grunbaum, B. W.; Kiepert, D. W.; Rahlmann, D. F.; and  
Smith, D. G.  
Urine Excretion Rates of Calcium, Creatine and Creatinine in the  
Test Monkeys and Flight Monkey Used for NASA Biosatellite 3. (EPL-  
71-1, California Univ., Berkeley; NAS2-4231.) Dec. 1, 1971.  
NASA CR-114425 X72-10225
125. Shinn, J. N.; and Honda, T.  
Study of an Augmented Fluidic Thruster for VTOL Aircraft Stabilization.  
(General Electric Co., Schenectady, N. Y.; NAS2-5467.) Mar. 1972.  
NASA CR-114587 X74-10016

LIFE SCIENCES DIRECTORATE

BIOMEDICAL RESEARCH DIVISION

NASA CONTRACTOR REPORTS

126. Anon.  
Study to Determine Viable Approaches to Computer-User Education at  
NASA. (Education Research, Inc., Berkeley, Calif.; NAS2-7092.) 1972.  
NASA CR-114488 X73-10009
127. Bustad, L. K.; and Fisher, G. L.  
Study on Photon Absorptiometer. Final Progress Report. (California  
Univ., Davis.; NAS2-7375.) Aug. 1973.  
NASA CR-114674 X73-80126
128. Rogers, S. S.  
Literature and Clinical Survey for Tests of Specific Endocrine Function.  
Final report. (GW-BSCP-72-11R, George Washington Univ., Washington,  
D. C.; NAS2-6283.) June 1972.  
NASA CR-114515 X73-10005

BIOTECHNOLOGY DIVISION

NASA CONTRACTOR REPORTS

129. Anon.  
Drosophila Biology in Space. Final Report. (Stanford Univ., Calif.; NAS2-6332.) 1972.  
NASA CR-114414 X72-72297
130. Bensch, K. G.  
Electron Microscopy Services and Research on Flight Experiment Drosophila Biology in Space. (Stanford Univ., Calif.; NAS2-6706.) Jan. 1973.  
NASA CR-114565 X73-71646
131. Gartner, W. B.  
Simulator Evaluation of Display Concepts for Pilot Monitoring and Control of Space Shuttle Approach and Landing. (Biotechnology, Inc., Los Altos, Calif.; NAS2-6460.) Dec. 1971.  
NASA CR-114468 X72-10495
132. Huang, C. C.; and Munson, B. R.  
Effects of Space Environment on Chromosomes and Nucleic Acid Synthesis of Human Lymphocytoid Cell Lines and Turtle Cell Lines. Final Report. (Roswell Park Memorial Inst., Springville, N. Y.; NAS2-6679.) May 1973.  
NASA CR-114628 X73-78660
133. Oates, R. W.; and Bentzen, N. J.  
Study of a Seat Design for Human Survival in Aircraft Emergencies. (REPT-496AMA901-001A, Stencel Aero Engineering Corp., Asheville, N. C.; NAS2-5101.) Mar. 8, 1972.  
NASA CR-114455 X72-10378

RESEARCH SUPPORT DIRECTORATE

NASA CONTRACTOR REPORTS

134. Link, W. T.  
Development of Electromagnetic Generators to Power Biotelemetry  
Systems. (Norse Systems, Inc., San Leandro, Calif.; NAS2-7061.)  
Jan. 1973.  
NASA CR-114551

X73-10114



RESEARCH FACILITIES AND INSTRUMENTATION DIVISION

NASA CONTRACTOR REPORTS

135. Bartko, F.; Cox, J.; Arshem, J.; and Weagant, R.  
Study to Compile Available Information for a Space Shuttle Mounted  
Infrared Telescope. Vol. 1. Discussion of Study; Final Progress  
Report. (MCR-73-104-VOL-1, Martin Marietta Corp., Denver; Honeywell,  
Inc., Lexington, Mass.; NAS2-7313.) May 1973.  
NASA CR-114644 X73-78160
136. Bartko, F.; Cox, J.; Arshem, J.; and Weagant, R.  
Study to Compile Available Information for a Space Shuttle Mounted  
Infrared Telescope. Vol. 2. Bibliography and Index; Final Progress  
Report. (MCR-73-104-VOL-2, Martin Marietta Corp., Denver; Honeywell,  
Inc., Lexington, Mass.; NAS2-7313.) May 1973.  
NASA CR-114645 X73-78161
137. Labarge, W. L.  
Experimental Evaluation of the Sonic Fatigue Resistance of Structure  
of a Modified C-141 Airplane Structure. (Lockheed-California Co.,  
Burbank; NAS2-7644.) Oct. 1973.  
NASA CR-114720 X74-10081

TECHNICAL SERVICES DIVISION

NASA CONTRACTOR REPORTS

138. Anon.  
Head Cooling Helicopter Pilots. Final Report. (AEROTHERM PROJ. 7053,  
Aerotherm Corp., Mountain View, Calif.; NAS2-6650.) 1972.  
NASA CR-114502

X72-81710

SYSTEMS STUDIES DIVISION

FORMAL REPORTS

139. Anon.  
Advanced Concepts and Missions Division Publications, 1972. Dec. 1972.  
NASA TM-X-62228 X73-71580
140. Anon.  
Systems Studies Division Publications, 1973. Dec. 1973.  
NASA TM-X-62332 X74-73760
141. Manning, L. A.; Edsinger, L. E.; Evans, L. C.; and Stratton, A. J.  
Preliminary Analysis of a Saturn Atmospheric Entry Probe. May 1973.  
NASA TM-X-62261 X73-76492
142. Masey, A. C.; Schaupp, R. W.; and Hayes, S. A.  
QUICKTOP 3: A Computer Program for Low Thrust Trajectory and Mass  
Optimization. Sept. 1973.  
NASA TM-X-62305 X73-10591
143. Waters, M. H.  
Transonic Transport Study: Propulsion Systems. May 1972.  
NASA TM-X-62158 X72-77493
144. Williams, L. J.  
An Analysis Method for Assessing the Impact of Aircraft Noise Reduction  
Options. Aug. 1973.  
NASA TM-X-62276 X73-10472

NASA CONTRACTOR REPORTS

145. Anon.  
Competitive Factors in World Civil Aviation. (Booz-Allen Applied  
Research, Inc., Bethesda, Md.; NAS2-6741.) Aug. 1972.  
NASA CR-114447 X73-10102
146. Anon.  
Estimation of Airframe Manufacturing Costs. Vol. 1. Summary. Final  
Report. (GDCA-BJF71-918-VOL-1, General Dynamics/Convair, San Diego,  
Calif.; NAS2-5718.) July 1972.  
NASA CR-114553 X73-10129
147. Anon.  
Estimation of Airframe Manufacturing Costs. Vol. 2. Technical  
Volume. Final Report. (GDCA-BJF71-918-VOL-2, General Dynamics/  
Convair, San Diego, Calif.; NAS2-5718.) July 1972.  
NASA CR-114554 X73-10130

148. Anon.  
Estimation of Airframe Manufacturing Costs. Vol. 3. User's Manual. Final Report. (GDCA-BJF71-918-VOL-3, General Dynamics/Convair, San Diego, Calif.; NAS2-5718.) July 1972.  
NASA CR-114555 X73-10131
149. Anon.  
Study of Cost Estimation of Research and Development Programs. Final Report. (NA-71-750-2, North American Rockwell Corp., Los Angeles, Calif.; NAS2-6173.) Sept. 21, 1971.  
NASA CR-114368 X71-10983
150. Anon.  
Study of Cost Estimation of Research and Development Programs. Summary Report. (NA-71-750-1, North American Rockwell Corp., Los Angeles, Calif.; NAS2-6173.) Sept. 21, 1971.  
NASA CR-114367 X71-10982
151. Anon.  
A Study of How Technology Transfer Affects the Competitive Position of the United States in the World Aviation Market. (Forecasting International, Ltd., Arlington, Va.; NAS2-6754.) Mar. 3, 1972.  
NASA CR-114448 X72-10663
152. Anon.  
A Study of the Costs and Benefits of the Application of Composite Materials to Civil STOL Aircraft. Executive Summary. (MDC-J4399, McDonnell-Douglas Corp., Long Beach, Calif.; NAS2-6994.) Dec. 1973.  
NASA CR-114700 X74-10065
153. Cielnicki, R. J.; and Hallet, R. W., Jr.  
A Study to Determine Costs of Solid Rocket Motor Boosted S-4B Stages. Vol. 1. Technical Details. (MDC-G2805-VOL-1, McDonnell-Douglas Astronautics Co., Huntington Beach, Calif.; NAS2-6446.) Dec. 1971.  
NASA CR-114430 X72-10450
154. Cielnicki, R. J.; and Baugh, R. M.  
A Study to Determine Costs of Solid Rocket Motor Boosted S-4B Stages. Vol. 2. Programmatic Details. Final Report. (MDC-G2805-VOL-2, McDonnell-Douglas Corp., Huntington Beach, Calif.; NAS2-6446.) Dec. 1971.  
NASA CR-114431 X72-10295
155. Cielnicki, R. J.; and Baugh, R. M.  
A Study of Determine Costs of Solid Rocket Motor Boosted S-4B Stages. Vol. 3. Restricted Cost Substantiation Data. (MDC-G2805-VOL-3, McDonnell-Douglas Astronautics Co., Huntington Beach, Calif.; NAS2-6446.) Dec. 1971.  
NASA CR-114432 X72-10451

C 4

156. Cielnicki, R. J.; and Baugh, R. M.  
A Study to Determine Costs of Solid Rocket Motor Boosted S-4B Stages.  
Final Summary Report. (MDC-G2805, McDonnell-Douglas Astronautics  
Co., Huntington Beach, Calif.; NAS2-6446.) Dec. 1971.  
NASA CR-114433 X72-10452
157. Duvivier, J. F.; Albertini, F.; Friedlander, S.; Levy, E.; and  
Peranteau, J.  
Methodology for the Evaluation of Intercity and Intraurban V/STOL  
Transportation Systems. Vol. 1. Summary of the INTRASIM Model and  
Sample Study. (D210-10315-1, Boeing Vertol Co., Philadelphia, Pa.;  
NAS2-6107.) July 1973.  
NASA CR-114667 X74-72855
158. Duvivier, J. F.; Albertini, F.; Friedlander, S.; Levy, E.; and  
Peranteau, J.  
Methodology for the Evaluation of Intercity and Intraurban V/STOL  
Transportation Systems. Vol. 2. Description of INTRASIM 2  
Methodology. (D210-10315-2, Boeing Vertol Co., Philadelphia, Pa.;  
NAS2-6107.) July 1973.  
NASA CR-114668 X74-72856
159. Duvivier, J. F.; Albertini, F.; Friedlander, S.; Levy, E.; and  
Peranteau, J.  
Methodology for the Evaluation of Intercity and Intraurban V/STOL  
Transportation Systems. Vol. 3. INTRASIM 2 User's Manual. (D210-  
10315-3, Boeing Vertol Co., Philadelphia, Pa.; NAS2-6107.) July 1973.  
NASA CR-114669 X74-72857
160. Johnson, F. T.  
Improvement of the QUICKTOP Digital Computer Program (CHEBYTOP 3).  
Final Report. (D180-15371-1, Boeing Aerospace Co., Seattle, Wash.;  
NAS2-7049.) Apr. 1973.  
NASA CR-114595 X73-10397
161. Logan, T. R.; Platte, M. M.; and Zwart, R. L.  
A Study of the Costs and Benefits of the Application of Composite  
Materials to Civil STOL Aircraft. Final Report. (MDC-J4395, Douglas  
Aircraft Co., Inc., Long Beach, Calif.; NAS2-6994-1.) Dec. 1973.  
NASA CR-114701 X74-10050
162. Wood, R. K.; Kyle, D. W.; O'Leary, K. L.; and Rogstad, B. K.  
Analysis of US Leadership Position in World Civil Aviation. Technical  
Report, Dec. 1971 - Apr. 1972. (PRC-R-1599, PRC Systems Sciences  
Co., Los Angeles, Calif.; NAS2-6777.) Apr. 1972.  
NASA CR-114449 X72-10620

ARMY AIR MOBILITY RESEARCH AND DEVELOPMENT LABORATORY

FORMAL REPORTS

163. Anon.  
U.S. Army Aviation R and D Technical Reports Published in 1971.  
Apr. 1972.  
(Also available as AD-894461) X72-78614

AUTHOR INDEX

A.

Abramson, R., 54, 64, 65  
Albertini, F., 157, 158, 159  
Allen, C. Q., 2  
Arshem, J., 135, 136

B.

Barringer, T. D., 28  
Bartko, F., 135, 136  
Baugh, R. M., 154, 155, 156  
Bell, D. E., 6  
Bensch, K. G., 130  
Bentzen, N. J., 133  
Billman, K. W., 86, 94  
Biraben, P., 115  
Boltz, F. W., 3  
Bondi, M. J., 52  
Bosch, J. C., 80  
Brain, A. E., 63  
Brownson, J. J., 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18  
Bustad, L. K., 127

C.

Caldwell, E. O., 57  
Cameron, B., 10  
Cameron, B. W., Jr., 103, 104, 105  
Campbell, J. E., 64  
Campbell, J. M., 56, 80, 81  
Cangie, C. D., 19, 36, 38, 43  
Castellano, C. R., 34  
Chambliss, E. B., 17  
Cielnicky, R. J., 153, 154, 155, 156  
Ciffone, D. L., 108  
Clasen, D. J., 2, 21, 30  
Cleary, J. W., 87, 88, 95, 96, 97  
Cleveland, W. B., 98  
Cohen, L. E., 31  
Cox, J., 135, 136  
Croft, T. A., 116  
Currie, J. W., Jr., 60

D.

Davies, C. B., 33  
Debevoise, J., 5  
DeRose, C. E., 99, 109  
De Voto, H. J., 1

Dods, J. B., Jr., 19  
Dresser, H. S., 10  
Drinkwell, F. J., 53  
Duvivier, J. F., 157, 158, 159

E.

Eckert, W. T., 50  
Edsinger, L. E., 141  
Eldridge, W. M., 82, 83, 84  
Eshleman, V. R., 116  
Evans, L. C., 141

F.

Fahey, R. E., 20, 21  
Fehl, T. W., 46  
Fisher, G. L., 127  
Fossler, I. H., 15  
Friedlander, S., 157, 158, 159

G.

Gallaher, W., 5  
Gartner, W. B., 131  
Gibson, W., 113  
Gobel, T. P., 85  
Gouffischer, L. I., 117, 121  
Goloman, C. R., 89  
Gregg, L. E., 47, 48, 51  
Gross, A. R., 17, 22  
Grunbaum, B. W., 124

H.

Hackett, J. E., 57  
Hallet, R. W., Jr., 153  
Hamilton, R. K., 102  
Harkonen, D. L., 81  
Harrin, E. N., 15  
Hayes, S. A., 142  
Hedstrom, C. E., 23  
Hickey, D. H., 49  
Hicks, R. M., 24, 25, 26, 27  
Hofstetter, W. R., 28  
Honda, T., 118, 125  
Hopkins, E. J., 29  
Houser, J., 7  
Huang, C. C., 132

I.

Intrieri, P. F., 110  
Intriligator, D. S., 92



J.

Jarrett, T. W., 8, 9  
Jensen, T. L., 8, 9  
Johnson, F. T., 160  
Jorgensen, L. H., 35  
Jung, W., 14

K.

Karpen, R. C., 122  
Kassner, D. L., 12, 30  
Kauffman, R. C., 31  
Kelley, G. S., 58  
Kelly, M. W., 49  
Kiepert, D. W., 124  
Kyle, D. W., 162

L.

Labarge, W. L., 137  
Lambregts, A. A., 82, 83, 84  
Lane, J. W., 52  
Latham, E. A., 45  
Lawrence, R. L., 56, 81  
Leef, C. R., 104, 105  
Levin, A. D., 32  
Levy, E., 157, 158, 159  
Levy, L. L., 25  
Link, W. T., 134  
Lockman, W. K., 99, 109  
Logan, T. R., 161

M.

Mahal, A., 59  
Maki, R. L., 46, 47, 48, 50, 51  
Malcolm, G. N., 111, 112  
Manning, L. A., 141  
Marouf, E. A., 116  
Mascy, A. C., 142  
McDevitt, J. B., 90, 100  
McGrath, J. T., 20, 37  
McNeill, W. E., 53  
Mellenthin, J. A., 90, 100, 101, 102, 103, 104, 105  
Mendoza, J. P., 24, 25, 26, 27  
Meriwether, F. D., 29  
Merrill, S. W., 20  
Miller, R. M., 7  
Munson, B. R., 132  
Murphy, J. D., 33

O.

Oates, R. W., 133  
Oberbeck, V. R., 89  
Oilye, R. G., 93  
O'Keefe, J. V., 56, 80, 81  
O'Leary, K. L., 162  
Olsen, D. C., 15

P.

Pace, N., 124  
Paerl, H. W., 89  
Pappas, C. C., 106  
Pearson, P. R., 4  
Pena, D. E., 29  
Peranteau, J., 157, 158, 159  
Petroff, D. N., 32  
Pettengill, G. H., 115  
Pettis, W., 3  
Platte, M. M., 161  
Praytor, E. B., 57

Q.

Quaide, W. L., 89  
Quan, M., 11, 14, 18, 101

R.

Radcliff, H. D., 34, 44  
Rahlmann, D. F., 124  
Rajapakse, Y. D. S., 107  
Rampy, J., 12  
Richards, R. C., 89  
Robinson, G. G., 52  
Robinson, H. L., 4  
Roepcke, F. A., 58  
Rogers, S. S., 128  
Rogstad, B. K., 162

S.

Sarver, D., 108  
Schaupp, R. W., 142  
Scher, S. H., 20  
Searle, N., 61  
Shapiro, I. I., 115  
Shinn, J. N., 118, 125  
Shumpert, P. K., 62  
Sihvonen, A. E., 39  
Sinclair, S. R. M., 98

Smeltzer, D. B., 45  
Smith, D. G., 124  
Soderman, P. T., 49  
Sorensen, N. E., 45  
Spitzer, R. E., 82, 83, 84  
Steckel, D. K., 35  
Steinle, F. W., Jr., 36, 37, 38, 39, 40, 41, 42, 43  
Stevens, V. C., 53  
Stoddart, S. A., 44  
Stokowski, S. E., 93  
Stone, J. S., 40  
Stratton, A. J., 141

T.

Tessitore, F. T., 11, 18, 101  
Tolhurst, W. H., Jr., 46, 47, 48, 50, 51  
Tyler, G. L., 116

V.

Viegas, J. R., 91  
Vomaske, R. F., 98

W.

Wang, T., 59  
Waters, M. H., 143  
Watson, V. R., 91  
Weagant, R., 135, 136  
Wettlaufer, B. M., 44  
Whitcomb, M., 4  
Whitcomb, W. M., Jr., 41, 42  
Whitnah, A. M., 12, 13, 16, 17  
Williams, L. J., 144  
Wood, R. K., 162  
Wright, F., 59  
Wrigley, R. C., 89

Z.

Zoerner, G. D., 102  
Zwart, R. L., 161