NASA
Scientific and Technical Publications

A Catalog of
Special Publications,
Reference Publications,
Conference Publications, and
Technical Papers

1987
NASA Scientific and Technical Publications

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Special Publications,
Reference Publications,
Conference Publications, and
Technical Papers

1987

Scientific and Technical Information Division 1988
National Aeronautics and Space Administration
Washington, DC
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PREFACE

The pursuit of human knowledge through scientific research and technical endeavor has vastly expanded understanding of our world and the universe we live in. The contributions of NASA through scientific and technical research and development affect not only our understanding and use of aeronautics and space but also touch our daily lives. Geologists, oceanographers, meteorologists, archeologists, aircraft engineers, aerospace decision makers, land-use planners, historians, and rescue teams all make use of the results of NASA's research. The findings of this research and development are published in NASA's scientific and technical report series as a part of NASA's mandate to disseminate the results of the agency's far-reaching work.

This catalog provides a list of NASA publications from four report series entered into the NASA scientific and technical information database during accession year 1987. Records of Achievement, NASA SP-470 (accession number N83-33792) and NASA Scientific and Technical Publications: A Catalog of Special Publications, Reference Publications, Conference Publications, and Technical Papers, 1977-1986, NASA SP-7063(01) (accession number N87-30218) list previous NASA publications not covered by this catalog. Two semimonthly abstract journals cover all aspects of aeronautics and space research, NASA and non-NASA, nationally and worldwide: STAR (Scientific and Technical Aerospace Reports), which focuses on scientific and technical reports, and IAA (International Aerospace Abstracts), which covers the open literature. These are available by subscription from, respectively, the U.S. Government Printing Office and the American Institute of Aeronautics and Astronautics, Inc., (see below).

This catalog includes publicly available reports from four NASA report series: Special Publications (SPs), Reference Publications (RPs), Conference Publications (CPs), and Technical Papers (TPs). The scope of each series is defined as follows:

**Special Publications** are often concerned with subjects of substantial public interest. They report scientific and technical information derived from NASA programs for audiences of diverse technical backgrounds.

**Reference Publications** contain compilations of scientific and technical data of continuing reference value.

**Conference Publications** record the proceedings of scientific and technical symposia and other professional meetings sponsored or cosponsored by NASA.

**Technical Papers** present the results of significant research conducted by NASA scientists and engineers.

Presented here are citations for reports from each of these series. An explanation of the elements in a typical citation follows. Accession numbers (N numbers) at the end of a citation are separate citations to articles within the report. Please use STAR to locate these citations. Also note that some bibliographies in the NASA SP-7000 series are issued periodically. This catalog lists only the last accessioned report in each bibliography series. The periodicity of each bibliography is as follows:

- **NASA SP-7011** *Aerospace Medicine and Biology: A Continuing Bibliography with Indexes* Monthly plus annual cumulative index
- **NASA SP-7037** *Aeronautical Engineering: A Continuing Bibliography with Indexes* Monthly plus annual cumulative index
- **NASA SP-7039** *NASA Patent Abstracts Bibliography: A Continuing Bibliography Section 1: Abstracts; Section 2: Indexes* Semiannual
- **NASA SP-7041** *Earth Resources: A Continuing Bibliography with Indexes* Quarterly
<table>
<thead>
<tr>
<th>NASA SP-7046</th>
<th>Technology for Large Space Systems: A Bibliography with Indexes</th>
<th>Semiannual</th>
</tr>
</thead>
<tbody>
<tr>
<td>NASA SP-7056</td>
<td>Space Station Systems: A Bibliography with Indexes</td>
<td>Semiannual</td>
</tr>
<tr>
<td>NASA SP-7500</td>
<td>Management: A Bibliography for NASA Managers</td>
<td>Annual</td>
</tr>
</tbody>
</table>

Please note that the reports cited in this catalog are available for purchase from the U.S. Government Printing Office for a limited time after publication, depending on public demand, and from the National Technical Information Service (NTIS) with no time limit. They are also available at any Federal Regional Depository Library. Additional availability information follows, including current NTIS price schedules, which are keyed to the price code in the citation.
The hardware and software characteristics of a time division multiplex system are described. The system is used to sample analog and digital data. The data is merged with synchronization information to produce a serial pulse coded modulation (PCM) bit stream. Information presented herein is required by users to design compatible interfaces and assure effective utilization of this encoder system. GSFC/Wallops Flight Facility has flown approximately 50 of these systems through 1984 on sounding rockets with no inflight failures. Aydin Vector manufactures all of the components for these systems.

Author
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STANDARD PRICE DOCUMENTS
AND MICROFICHE

<table>
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<tr>
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#### Schedule E
EXCEPTION PRICE DOCUMENTS
AND MICROFICHE

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# TABLE OF CONTENTS

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Includes aeronautics (general); aerodynamics; air transportation and safety; aircraft communications and navigation; aircraft design, testing and performance; aircraft instrumentation; aircraft propulsion and power; aircraft stability and control; and research and support facilities (air).

For related information see also Astronautics.

<table>
<thead>
<tr>
<th>Section</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>01 AERONAUTICS (GENERAL)</td>
<td>1</td>
</tr>
<tr>
<td>02 AERODYNAMICS</td>
<td>1</td>
</tr>
<tr>
<td>03 AIR TRANSPORTATION AND SAFETY</td>
<td>5</td>
</tr>
<tr>
<td>04 AIRCRAFT COMMUNICATIONS AND NAVIGATION</td>
<td>N.A.</td>
</tr>
<tr>
<td>05 AIRCRAFT DESIGN, TESTING AND PERFORMANCE</td>
<td>5</td>
</tr>
<tr>
<td>06 AIRCRAFT INSTRUMENTATION</td>
<td>7</td>
</tr>
<tr>
<td>07 AIRCRAFT PROPULSION AND POWER</td>
<td>7</td>
</tr>
<tr>
<td>08 AIRCRAFT STABILITY AND CONTROL</td>
<td>8</td>
</tr>
<tr>
<td>09 RESEARCH AND SUPPORT FACILITIES (AIR)</td>
<td>8</td>
</tr>
</tbody>
</table>

## ASTRONAUTICS

Includes astronautics (general); astrodynamics; ground support systems and facilities (space); launch vehicles and space vehicles; space transportation; space communications, spacecraft communications, command and tracking; spacecraft design, testing and performance; spacecraft instrumentation; and spacecraft propulsion and power.

For related information see also Astronautics

<table>
<thead>
<tr>
<th>Section</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>10 ASTRONAUTICS (GENERAL)</td>
<td>9</td>
</tr>
<tr>
<td>11 ASTRODYNAMICS</td>
<td>N.A.</td>
</tr>
<tr>
<td>12 GROUND SUPPORT SYSTEMS AND FACILITIES (SPACE)</td>
<td>N.A.</td>
</tr>
<tr>
<td>13 LAUNCH VEHICLES AND SPACE VEHICLES</td>
<td>9</td>
</tr>
<tr>
<td>14 SPACE TRANSPORTATION</td>
<td>10</td>
</tr>
<tr>
<td>15 SPACE COMMUNICATIONS, SPACECRAFT COMMUNICATIONS, COMMAND AND TRACKING</td>
<td>N.A.</td>
</tr>
</tbody>
</table>

For extraterrestrial exploration see 91 Lunar and Planetary Exploration.

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### NASA Scientific and Technical Publications 1987
18 SPACECRAFT DESIGN, TESTING AND PERFORMANCE
Includes satellites; space platforms; space stations; spacecraft systems and components such as thermal and environmental controls; and attitude controls.
For life support systems see 54 Man/System Technology and Life Support. For related information see also 05 Aircraft Design, Testing and Performance, 39 Structural Mechanics, and 16 Space Transportation.

19 SPACECRAFT INSTRUMENTATION N.A.
For related information see also 06 Aircraft Instrumentation and 35 Instrumentation and Photography.

20 SPACECRAFT PROPULSION AND POWER
Includes main propulsion systems and components, e.g. rocket engines; and spacecraft auxiliary power sources.
For related information see also 07 Aircraft Propulsion and Power, 28 Propellants and Fuels, 44 Energy Production and Conversion, and 15 Launch Vehicles and Space Vehicles.

CHEMISTRY AND MATERIALS
Includes chemistry and materials (general); composite materials; inorganic and physical chemistry; metallic materials; nonmetallic materials; propellants and fuels; and materials processing.

23 CHEMISTRY AND MATERIALS (GENERAL) 11

24 COMPOSITE MATERIALS 11
Includes physical, chemical, and mechanical properties of laminates and other composite materials.
For ceramic materials see 27 Nonmetallic Materials.

25 INORGANIC AND PHYSICAL CHEMISTRY 12
Includes chemical analysis, e.g., chromatography; combustion theory; electrochemistry, and photochemistry.
For related information see also 77 Thermodynamics and Statistical Physics.

26 METALLIC MATERIALS 12
Includes physical, chemical, and mechanical properties of metals, e.g., corrosion; and metallurgy.

27 NONMETALLIC MATERIALS 12
Includes physical, chemical, and mechanical properties of plastics, elastomers, lubricants, polymers, textiles, adhesives, and ceramic materials.
For composite materials see 24 Composite Materials.

28 PROPELLANTS AND FUELS N.A.
Includes rocket propellants, igniters and oxidizers; their storage and handling procedures; and aircraft fuels.
For related information see also 07 Aircraft Propulsion and Power, 28 Propellants and Fuels, 44 Energy Production and Conversion.

29 MATERIALS PROCESSING 13
Includes space-based development of products and processes for commercial application.
For biological materials see 55 Space Biology.

ENGINEERING
Includes engineering (general); communications and radar; electronics and electrical engineering; fluid mechanics and heat transfer; instrumentation and photography; lasers and masers; mechanical engineering; quality assurance and reliability; and structural mechanics.
For related information see also Physics.

31 ENGINEERING (GENERAL) 13
Includes vacuum technology; control engineering; display engineering; cryogenics; and fire prevention.

32 COMMUNICATIONS AND RADAR 13
Includes radar; land and global communications; communications theory; and optical communications.
For related information see also 04 Aircraft Communications and Navigation and 17 Space Communications, Spacecraft Communications, Command and Tracking. For search and rescue see 03 Air Transportation and Safety, and 16 Space Transportation.

33 ELECTRONICS AND ELECTRICAL ENGINEERING 14
Includes test equipment and maintainability; components, e.g., tunnel diodes and transistors; microminiaturization; and integrated circuitry.
For related information see also 60 Computer Operations and Hardware and 76 Solid-State Physics.

34 FLUID MECHANICS AND HEAT TRANSFER 14
Includes boundary layers; hydrodynamics; fluidics; mass transfer and ablation cooling.
For related information see also 02 Aerodynamics and 77 Thermodynamics and Statistical Physics.

35 INSTRUMENTATION AND PHOTOGRAPHY 16
Includes remote sensors; measuring instruments and gages; detectors; cameras and photographic supplies; and holography.
For aerial photography see 43 Earth Resources and Remote Sensing. For related information see also 06 Aircraft Instrumentation and 19 Spacecraft Instrumentation.

36 LASERS AND MASERS 16
Includes parametric amplifiers.
For related information see also 76 Solid-State Physics.

37 MECHANICAL ENGINEERING 16
Includes auxiliary systems (nonpower); machine elements and processes; and mechanical equipment.

38 QUALITY ASSURANCE AND RELIABILITY 17
Includes product sampling procedures and techniques; and quality control.

39 STRUCTURAL MECHANICS 17
Includes structural element design and weight analysis; fatigue; and thermal stress.
GEOSCIENCES
Includes geosciences (general); earth resources and remote sensing; energy production and conversion; environment pollution; geophysics; meteorology and climatology; and oceanography.
For related information see also Space Sciences.

42 GEOSCIENCES (GENERAL) 18

43 EARTH RESOURCES AND REMOTE SENSING 18
Includes remote sensing of earth resources by aircraft and spacecraft; photogrammetry; and aerial photography.
For instrumentation see 35 Instrumentation and Photography.

44 ENERGY PRODUCTION AND CONVERSION 19
Includes specific energy conversion systems, e.g., fuel cells; global sources of energy; geophysical conversion; and windpower.
For related information see also 07 Aircraft Propulsion and Power, 20 Spacecraft Propulsion and Power, and 28 Propellants and Fuels.

45 ENVIRONMENT POLLUTION N.A.
Includes atmospheric, noise, thermal, and water pollution.

46 GEOPHYSICS 19
Includes aeronomy; upper and lower atmosphere studies; ionospheric and magnetospheric physics; and geomagnetism.
For space radiation see 93 Space Radiation.

47 METEOROLOGY AND CLIMATOLOGY 20
Includes weather forecasting and modification.

48 OCEANOGRAPHY 21
Includes biological, dynamic, and physical oceanography; and marine resources.
For related information see also 43 Earth Resources and Remote Sensing.

LIFE SCIENCES
Includes life sciences (general); aerospace medicine; behavioral sciences; man/system technology and life support; and space biology.

51 LIFE SCIENCES (GENERAL) 21

52 AEROSPACE MEDICINE 21
Includes physiological factors; biological effects of radiation; and effects of weightlessness on man and animals.

53 BEHAVIORAL SCIENCES N.A.
Includes psychological factors; individual and group behavior; crew training and evaluation; and psychiatric research.

54 MAN/SYSTEM TECHNOLOGY AND LIFE SUPPORT N.A.
Includes human engineering; biotechnology; and space suits and protective clothing.
For related information see also 16 Space Transportation.

55 SPACE BIOLOGY N.A.
Includes exobiology; planetary biology; and extraterrestrial life.

MATHEMATICAL AND COMPUTER SCIENCES
Includes mathematical and computer sciences (general); computer operations and hardware; computer programming and software; computer systems; cybernetics; numerical analysis; statistics and probability; systems analysis; and theoretical mathematics.

59 MATHEMATICAL AND COMPUTER SCIENCES (GENERAL) N.A.

60 COMPUTER OPERATIONS AND HARDWARE N.A.
Includes hardware for computer graphics, firmware, and data processing.
For components see 33 Electronics and Electrical Engineering.

61 COMPUTER PROGRAMMING AND SOFTWARE 22
Includes computer programs, routines, algorithms, and specific applications, e.g., CAD/CAM.

62 COMPUTER SYSTEMS 22
Includes computer networks and special application computer systems.

63 CYBERNETICS N.A.
Includes feedback and control theory, artificial intelligence, robotics and expert systems.
For related information see also 54 Man/System Technology and Life Support.

64 NUMERICAL ANALYSIS 22
Includes iteration, difference equations, and numerical approximation.

65 STATISTICS AND PROBABILITY 23
Includes data sampling and smoothing; Monte Carlo method; and stochastic processes.

66 SYSTEMS ANALYSIS N.A.
Includes mathematical modeling; network analysis; and operations research.

67 THEORETICAL MATHEMATICS N.A.
Includes topology and number theory.

PHYSICS
Includes physics (general); acoustics; atomic and molecular physics; nuclear and high-energy physics; optics; plasma physics; solid-state physics; and thermodynamics and statistical physics.
For related information see also Engineering.

70 PHYSICS (GENERAL) N.A.
For precision time and time interval (PTTI) see 35 Instrumentation and Photography; for geophysics, astrophysics or solar physics see 46 Geophysics, 90 Astrophysics, or 92 Solar Physics.
71 ACOUSTICS Includes sound generation, transmission, and attenuation.
For noise pollution see 45 Environment Pollution.

72 ATOMIC AND MOLECULAR PHYSICS N.A.
Includes atomic structure, electron properties, and molecular spectra.

73 NUCLEAR AND HIGH-ENERGY PHYSICS 24
Includes elementary and nuclear particles; and reactor theory.
For space radiation see 93 Space Radiation.

74 OPTICS 24
Includes light phenomena and optical devices.
For lasers see 36 Lasers and Masers.

75 PLASMA PHYSICS 24
Includes magnetohydrodynamics and plasma fusion.
For ionospheric plasmas see 46 Geophysics. For space plasmas see 90 Astrophysics.

76 SOLID-STATE PHYSICS N.A.
Includes superconductivity.
For related information see also 33 Electronics and Electrical Engineering and 36 Lasers and Masers.

77 THERMODYNAMICS AND STATISTICAL PHYSICS N.A.
Includes quantum mechanics; theoretical physics; and Bose and Fermi statistics.
For related information see also 25 Inorganic and Physical Chemistry and 34 Fluid Mechanics and Heat Transfer.

SOCIAL SCIENCES
Includes social sciences (general); administration and management; documentation and information science; economics and cost analysis; law, political science, and space policy; and urban technology and transportation.

80 SOCIAL SCIENCES (GENERAL) N.A.
Includes educational matters.

81 ADMINISTRATION AND MANAGEMENT 24
Includes management planning and research.

82 DOCUMENTATION AND INFORMATION SCIENCE 24
Includes information management; information storage and retrieval technology; technical writing; graphic arts; and micrography.
For computer documentation see 61 Computer Programming and Software.

83 ECONOMICS AND COST ANALYSIS N.A.
Includes cost effectiveness studies.

84 LAW, POLITICAL SCIENCE AND SPACE POLICY N.A.
Includes NASA appropriation hearings; aviation law; space law and policy; international law; international cooperation; and patent policy.

85 URBAN TECHNOLOGY AND TRANSPORTATION 25
Includes applications of space technology to urban problems; technology transfer; technology assessment; and surface and mass transportation.
For related information see 03 Air Transportation and Safety, 16 Space Transportation, and 44 Energy Production and Conversion.

SPACE SCIENCES
Includes space sciences (general); astronomy; astrophysics; lunar and planetary exploration; solar physics; and space radiation.
For related information see also Geosciences.

88 SPACE SCIENCES (GENERAL) 25

89 ASTRONOMY 25
Includes radio, gamma-ray, and infrared astronomy; and astrometry.

90 ASTROPHYSICS 26
Includes cosmology; celestial mechanics; space plasmas; and interstellar and interplanetary gases and dust.
For related information see also 75 Plasma Physics.

91 LUNAR AND PLANETARY EXPLORATION 26
Includes planetology; and manned and unmanned flights.
For spacecraft design or space stations see 18 Spacecraft Design, Testing and Performance.

92 SOLAR PHYSICS 26
Includes solar activity, solar flares, solar radiation and sunspots.
For related information see 93 Space Radiation.

93 SPACE RADIATION 27
Includes cosmic radiation; and inner and outer earth's radiation belts.
For biological effects of radiation see 52 Aerospace Medicine. For theory see 73 Nuclear and High-Energy Physics.

GENERAL
Includes aeronautical, astronautical, and space science related histories, biographies, and pertinent reports too broad for categorization; histories or broad overviews of NASA programs.

99 GENERAL 27

Note: N.A. means that no abstracts were assigned to this category for this issue.

SUBJECT INDEX ........................................................................ A-1
PERSONAL AUTHOR INDEX .................................................. B-1
REPORT NUMBER INDEX ...................................................... C-1
AERONAUTICS (GENERAL)

N87-18520*# National Aeronautics and Space Administration. Langley Research Center, Hampton, Va.
JOINT UNIVERSITY PROGRAM FOR AIR TRANSPORTATION RESEARCH, 1983
(NASA-CP-2451; L-16254; NAS 1.55:2451) Avail: NTIS HC A05/MF A01 CSCL 01B
AIR NAVIGATION, AIR TRANSPORTATION, AIRCRAFT GUIDANCE, AVIONICS, CONFERENCES, FLIGHT CONTROL

N87-22604*# National Aeronautics and Space Administration. Langley Research Center, Hampton, Va.
JOINT UNIVERSITY PROGRAM FOR AIR TRANSPORTATION RESEARCH, 1984
FREDERICK R. MORRELL, comp. May 1987 165 p Meeting held in Hampton, Va., 18 Jan. 1985
(NASA-CP-2452; L-16255; NAS 1.55:2452) Avail: NTIS HC A08/MF A01 CSCL 01B
AIR TRANSPORTATION, AIRCRAFT CONTROL, AIRCRAFT GUIDANCE, AVIONICS, CONTROL THEORY, SURFACE NAVIGATION

N87-25267*# National Aeronautics and Space Administration. Langley Research Center, Hampton, Va.
WIND SHEAR/TURBULENCE INPUTS TO FLIGHT SIMULATION AND SYSTEMS CERTIFICATION
(NASA-CP-2474; L-16329; NAS 1.55:2474) Avail: NTIS HC A12/MF A01 CSCL 01B
AIRCRAFT PERFORMANCE, AVIONICS, FLIGHT SAFETY, FLIGHT SIMULATION, PILOT PERFORMANCE, WIND SHEAR

N87-27596*# National Aeronautics and Space Administration. Langley Research Center, Hampton, Va.
JOINT UNIVERSITY PROGRAM FOR AIR TRANSPORTATION RESEARCH, 1985
(NAS 1.55:2453; NASA-CP-2453) Avail: NTIS HC A05/MF A01 CSCL 01B
AIR TRAFFIC CONTROL, AIR TRANSPORTATION, CONFERENCES, FAULT TOLERANCE, FLIGHT CONTROL, GLOBAL POSITIONING SYSTEM, INERTIAL NAVIGATION

N87-27613* National Aeronautics and Space Administration, Washington, D.C.
AERONAUTICAL ENGINEERING: A CONTINUING BIBLIOGRAPHY WITH INDEXES (SUPPLEMENT 217)
Sep. 1987 134 p
(NASA-SP-7037(217); NAS 1.21:7037(217)) Avail: NTIS HC A07 CSCL 01B
This bibliography lists 450 reports, articles, and other documents introduced into the NASA scientific and technical information system in August, 1987.

AERODYNAMICS

Includes aerodynamics of bodies, combinations, wings, rotors, and control surfaces; and internal flow in ducts and turbomachinery.

N87-10039*# National Aeronautics and Space Administration. Langley Research Center, Hampton, Va.
WIND-TUNNEL INVESTIGATION OF THE FLIGHT CHARACTERISTICS OF A CANARD GENERAL-AVIATION AIRPLANE CONFIGURATION
D. R. SATRAN Oct. 1986 60 p
(NASA-CP-2623; L-15929; NAS 1.60:2623) Avail: NTIS HC A04/MF A01 CSCL 01A
CANARD CONFIGURATIONS, FLIGHT CHARACTERISTICS, GENERAL AVIATION AIRCRAFT, WIND TUNNEL TESTS

N87-10042*# National Aeronautics and Space Administration. Langley Research Center, Hampton, Va.
SUPERSONIC, NONLINEAR, ATTACHED-FLOW WING DESIGN FOR HIGH LIFT WITH EXPERIMENTAL VALIDATION
(NASA-TP-2336; L-15787; NAS 1.60:2336) Avail: NTIS HC A10/MF A01 CSCL 01A
CAMBERED WINGS, REATTACHED FLOW, SUPERCRITICAL FLOW, SUPERSONIC AIRFOILS, SUPERSONIC FLOW

N87-10838*# National Aeronautics and Space Administration. Langley Research Center, Hampton, Va.
EFFECTS OF TAIL SPAN AND EMPENNAGE ARRANGEMENT ON DRAG OF A TYPICAL SINGLE-ENGINE FIGHTER AFT END
J. R. BURLEY, II and B. L. BERRIER Sep. 1984 136 p
(NASA-TP-2352; L-15742; NAS 1.60:2352) Avail: NTIS HC A07/MF A01 CSCL 01A
AERODYNAMIC DRAG, AIRCRAFT CONFIGURATIONS, SKIN FRICTION, TAIL ASSEMBLIES, TRANSONIC SPEED
THREE-DIMENSIONAL, UNSTEADY, FULL-POTENTIAL CALCULATION OF STATIC INTERNAL PERFORMANCE OF SINGLE-EXPANSION-RAMP NOZZLES WITH THRUST-VECTORIZATION CAPABILITY UP TO 60 DEG

B. L. BERRIER and L. D. LEAVITT Oct. 1984 144 p (NASA-TP-2364; L-15766; NAS 1.60:2364) Avail: NTIS HC A07/MF A01 CSCL 01A

- AXISYMMETRIC BODIES, NOZZLE FLOW, THRUST VECTOR CONTROL

N87-10841*# National Aeronautics and Space Administration. Ames Research Center, Moffett Field, Calif.

TRANSONIC FLOW ANALYSIS FOR ROTORS. PART 2: THREE-DIMENSIONAL, UNSTEADY, FULL-POTENTIAL CALCULATION

I. C. CHANG Jan. 1985 27 p (NASA-TP-2375-PT-2; A-9682; NAS 1.60:2375-PT-2) Avail: NTIS HC A03/MF A01 CSCL 01A

- AERODYNAMIC STABILITY, HELICOPTER PERFORMANCE, ROTORS, TIP VANES, TRANSONIC FLOW

N87-10843*# National Aeronautics and Space Administration. Langley Research Center, Hampton, Va.

PILOTED SIMULATION STUDY OF THE EFFECTS OF AN AUTOMATED TRIM SYSTEM ON FLIGHT CHARACTERISTICS OF A LIGHT TWIN-ENGINE AIRPLANE WITH ONE ENGINE INOPERATIVE

E. C. STEWART, P. W. BROWN, and K. R. YENNI Nov. 1986 41 p (NASA-TP-2633; L-16147; NAS 1.60:2633) Avail: NTIS HC A03/MF A01 CSCL 01A

- AERODYNAMIC BALANCE, AUTOMATIC FLIGHT CONTROL, ENGINE FAILURE, LIGHT AIRCRAFT

N87-11702*# National Aeronautics and Space Administration. Langley Research Center, Hampton, Va.

FORWARD-SWEPT WING CONFIGURATION DESIGNED FOR HIGH MANEUVERABILITY BY USE OF A TRANSONIC COMPUTATIONAL METHOD

M. J. MANN and C. E. MERCER Nov. 1986 185 p (NASA-TP-2628; L-16120; NAS 1.60:2628) Avail: NTIS HC A09/MF A01 CSCL 01A

- AERODYNAMIC CONFIGURATIONS, HIGHLY MANEUVERABLE AIRCRAFT, SWEEP FORWARD WINGS, TRANSONIC SPEED

N87-12541*# National Aeronautics and Space Administration. Langley Research Center, Hampton, Va.

EFFECT OF PORT CORNER GEOMETRY ON THE INTERNAL PERFORMANCE OF A ROTATING-VANE-TYPE THRUST REVERSER

B. L. BERRIER and F. J. CAPONE Dec. 1986 51 p (NASA-TP-2624; L-16135; NAS 1.60:2624) Avail: NTIS HC A04/MF A01 CSCL 01A

- CORNER FLOW, NOZZLE GEOMETRY, PORTS (OPENINGS), ROTATING BODIES, THRUST REVERSAL, VANES, WIND TUNNEL TESTS

N87-14284*# National Aeronautics and Space Administration. Lewis Research Center, Cleveland, Ohio.

PROPAGATION OF SOUND WAVES IN TUBES OF NONCIRCULAR CROSS SECTION

W. B. RICHARDS (Oberlin Coll., Ohio) Aug. 1986 33 p (NASA-TP-2601; E-2690; NAS 1.60:2601) Avail: NTIS HC A03/MF A01 CSCL 01A

- ELLIPTICAL CYLINDERS, PIPES (TUBES), SOUND WAVES, WAVE PROPAGATION

N87-15174*# National Aeronautics and Space Administration. Langley Research Center, Hampton, Va.

APPLICABILITY OF LINEARIZED-THEORY ATTACHED-FLOW METHODS TO DESIGN AND ANALYSIS OF FLAP SYSTEMS AT LOW SPEEDS FOR THIN SWEPT WINGS WITH SHARP LEADING EDGES

HARRY W. CARLSON and CHRISTINE M. DARDEN Jan. 1987 54 p (NASA-TP-2653; L-16151; NAS 1.60:2653) Avail: NTIS HC A04/MF A01 CSCL 01A

- DESIGN ANALYSIS, FLAPS (CONTROL SURFACES), LINEARITY, LOW SPEED, SHARP LEADING EDGES, SWEPT WINGS, THIN WINGS, VORTEX FLAPS

N87-15183*# National Aeronautics and Space Administration. Langley Research Center, Hampton, Va.

EFFICIENT SOLUTIONS TO THE EULER EQUATIONS FOR SUPersonic FLOW WITH EMBEDDED SUBSONIC REGIONS

ROBERT W. WALTERS and DOUGLAS L. DWOYER Jan. 1987 18 p (NASA-TP-2523; L-15975; NAS 1.60:2523) Avail: NTIS HC A02/MF A01 CSCL 01A

- EMBEDDING, EULER EQUATIONS OF MOTION, PROBLEM SOLVING, SUBSONIC FLOW, SUPersonic FLOW

N87-15184*# National Aeronautics and Space Administration. Langley Research Center, Hampton, Va.

SUBSONIC MANEUVER CAPABILITY OF A SUPERSONIC CRUISE FIGHTER WING CONCEPT

GREGORY D. RIEBE and CHARLES H. FOX, JR. Jan. 1987 74 p (NASA-TP-2642; L-16097; NAS 1.60:2642) Avail: NTIS HC A04/MF A01 CSCL 01A

- FIGHTER AIRCRAFT, MANEUVERS, SUBSONIC SPEED, SUPERSONIC CRUISE AIRCRAFT RESEARCH, WINGS

N87-17665*# National Aeronautics and Space Administration. Lewis Research Center, Cleveland, Ohio.

PRELIMINARY DESIGN OF TURBOPUMPS AND RELATED MACHINERY

GEORGE F. WISLICENUS Oct. 1986 397 p (NAS3-13475)

- Pumps used in large liquid-fuel rocket engines are examined. The term preliminary design denotes the initial, creative phases of design, where the general shape and characteristics of the machine are determined. This compendium is intended to provide the design engineer responsible for these initial phases with a physical understanding and background knowledge of the numerous special fields involved in the design process. Primary attention is directed to the pumping part of the turbopump and hence is concerned with essentially incompressible fluids. However, compressible flow principles are developed. As much as possible, the simplicity and reliability of incompressible flow considerations are retained by treating the mechanics of compressible fluids as a departure from the theory of incompressible fluids. Five areas are discussed: a survey of the field of turbomachinery in dimensionless form; the theoretical principles of the hydrodynamic design of turbomachinery; the hydrodynamic and gas dynamic design of axial flow turbomachinery; the hydrodynamic and gas dynamic design of radial and mixed flow turbomachinery; and some mechanical design considerations of turbomachinery. Theoretical considerations are presented with a relatively elementary mathematical treatment. Author
N87-17668# National Aeronautics and Space Administration. Langley Research Center, Hampton, Va. WIND-TUNNEL INVESTIGATION AT SUPERSONIC SPEEDS OF A REMOTE-CONTROLLED CANARD MISSILE WITH A FREE-ROLLING-TAIL BRAKE TORQUE SYSTEM A. B. BLAIR, JR. Mar. 1985 38 p (NASA-TP-2401; L-15882; NAS 1.60:2401) Avail: NTIS HC A03/MF A01 CSCL 01A BRAKING, CANARD CONFIGURATIONS, FINS, MISSILE CONFIGURATIONS, REMOTE CONTROL, ROLLING MOMENTS, SUPERSONIC SPEED, TAIL ASSEMBLIES, TORQUE, WIND TUNNEL TESTS

N87-17669# National Aeronautics and Space Administration. Lewis Research Center, Cleveland, Ohio. COMBINED AERODYNAMIC AND STRUCTURAL DYNAMIC PROBLEM EMULATING ROUTINES (CASPER): THEORY AND IMPLEMENTATION WILLIAM H. JONES Feb. 1985 75 p (NASA-TP-2418; E-2278; NAS 1.60:2418) Avail: NTIS HC A04/MF A01 CSCL 01A AERODYNAMIC COEFFICIENTS, COMPUTATIONAL FLUID DYNAMICS, COMPUTERIZED SIMULATION, DYNAMIC STRUCTURAL ANALYSIS


N87-19351# National Aeronautics and Space Administration. Lewis Research Center, Cleveland, Ohio. NUMERICAL SIMULATION OF CHANNEL FLOW TRANSITION, RESOLUTION REQUIREMENTS AND STRUCTURE OF THE HAIRPIN VORTEX STEVEN E. KRIST (Joint Inst. for Advancement of Flight Sciences, Hampton, Va.) and THOMAS A. ZANG Apr. 1987 71 p (NASA-TP-2667; L-16204; NAS 1.60:2667) Avail: NTIS HC A04/MF A01 CSCL 01A BOUNDARY LAYER STABILITY, BOUNDARY LAYER TRANSITION, BOUNDARY VALUE PROBLEMS, CHANNEL FLOW, COMPUTATIONAL FLUID DYNAMICS, SPECTRAL METHODS

N87-20966# National Aeronautics and Space Administration. Hugh L. Dryden Flight Research Center, Edwards, Calif. IN-FLIGHT SURFACE OIL-FLOW PHOTOGRAPHS WITH COMPARISONS TO PRESSURE DISTRIBUTION AND BOUNDARY-LAYER DATA ROBERT R. MEYER, JR. and LISA A. JENNETT Apr. 1985 27 p Original contains color illustrations (NASA-TP-2395; H/1/MF; NAS 1.60:2395) Avail: NTIS HC A03/MF A01 CSCL 01A BOUNDARY LAYER FLOW, FLOW VISUALIZATION, IN-FLIGHT MONITORING, OILS, PHOTOGRAPHY, PRESSURE DISTRIBUTION

N87-21855# National Aeronautics and Space Administration. Langley Research Center, Hampton, Va. WIND-TUNNEL FREE-FLIGHT INVESTIGATION OF A 0.15-SCALE MODEL OF THE F-106B AIRPLANE WITH VORTEX FLAPS LONG P. YIP May 1987 46 p (NASA-TP-2700; L-16202; NAS 1.60:2700) Avail: NTIS HC A04/MF A01 CSCL 01A F-106 AIRCRAFT, FREE FLIGHT, VORTEX FLAPS, WIND TUNNEL MODELS, WIND TUNNEL TESTS


N87-22265# National Aeronautics and Space Administration. Langley Research Center, Hampton, Va. EXPERIMENTAL CAVITY PRESSURE DISTRIBUTIONS AT SUPERSONIC SPEEDS ROBERT L. STALLINGS, JR. and FLOYD J. WILCOX, JR. Jun. 1987 79 p (NASA-TP-2683; L-16215; NAS 1.60:2683) Avail: NTIS HC A05/MF A01 CSCL 01A CAVITIES, FLUID FLOW, PRESSURE DISTRIBUTION, SUPERSONIC SPEED

N87-23586# National Aeronautics and Space Administration. Langley Research Center, Hampton, Va. ON MINIMIZING THE NUMBER OF CALCULATIONS IN DESIGN-BY-ANALYSIS CODES RAYMOND L. BARGER and ANUTOSH MOITRA Jun. 1987 16 p (NASA-TP-2706; L-16226; NAS 1.60:2706) Avail: NTIS HC A02/MF A01 CSCL 01A AERODYNAMIC CONFIGURATIONS, APPROXIMATION, DESIGN ANALYSIS, NUMERICAL ANALYSIS, PRESSURE DISTRIBUTION
N87-23592*# National Aeronautics and Space Administration. Langley Research Center, Hampton, Va.
MACH 6 EXPERIMENTAL AND THEORETICAL STABILITY AND PERFORMANCE OF A CRUCIFORM MISSILE AT ANGLES OF ATTACK UP TO 65 DEGREES
EDWARD R. HARTMAN (Arnold Engineering Development Center, Arnold Air Force Station, Tenn.) and PATRICK J. JOHNSTON
 Jul. 1987 41 p
(NASA-TP-2733; L-16267; NAS 1.60:2733) Avail: NTIS HC
A03/MF A01 CSCL 01A
ANGLE OF ATTACK, CRUCIFORM WINGS, EXPERIMENTATION, HYPERSONIC SPEED, MACH NUMBER, MISSILES

N87-23595*# National Aeronautics and Space Administration. Langley Research Center, Hampton, Va.
EFFECT OF A TRADE BETWEEN BOATTAIL ANGLE AND WEDGE SIZE ON THE PERFORMANCE OF A NONAXISYMMETRIC WEDGE NOZZLE
GEORGE T. CARSON, JR., E. ANN BARE, and JAMES R. BURLEY, II
 Jul. 1987 67 p
(NASA-TP-2717; L-16248; NAS 1.60:2717) Avail: NTIS HC
AO4/MF A01 CSCL 01A
AXISYMMETRIC BODIES, BOATTAILS, NOZZLE GEOMETRY, PERFORMANCE TESTS, TRADEOFFS, WEDGES

N87-23597*# National Aeronautics and Space Administration. Langley Research Center, Hampton, Va.
STUDY OF LEE-SIDE FLOWS OVER CONICALLY CAMBERED DELTA WINGS AT SUPersonic speeds, PART 1
RICHARD M. WOOD and CAROLYN B. WATSON
 Jul. 1987 212 p
(NASA-TP-2660-PT-1; L-16192; NAS 1.60:2660-PT-1) Avail: NTIS HC
A10/MF A01 CSCL 01A
CONICAL CAMBER, DELTA WINGS, FLOW DISTRIBUTION, LEE WAVES, STRUCTURAL DESIGN, SUPersonic FLOW, VORTICES

N87-24410*# National Aeronautics and Space Administration. Ames Research Center, Moffett Field, Calif.
PROCEEDINGS OF THE 1985 NASA AMES RESEARCH CENTER'S GROUND-EFFECTS WORKSHOP
(NASA-CP-2462; A-86991; NAS 1.55:2462) Avail: NTIS HC
A19/MF A01 CSCL 01A
GROUND EFFECT (AERODYNAMICS), INGESTION (ENGINES), POWERED LIFT AIRCRAFT, V/STOL AIRCRAFT, VERTICAL LANDING

N87-24432*# National Aeronautics and Space Administration. Langley Research Center, Hampton, Va.
STATIC INTERNAL PERFORMANCE OF A TWO-DIMENSIONAL CONVERGENT-DIVERGENT NOZZLE WITH THRUST VECTORING
E. ANN BARE and DAVID E. REUBUSH
 Jul. 1987 115 p
(NASA-TP-2721; L-16240; NAS 1.60:2721) Avail: NTIS HC
A06/MF A01 CSCL 01A
CONVERGENT-DIVERGENT NOZZLES, STATIC TESTS, THRUST VECTOR CONTROL, TWO DIMENSIONAL FLOW

N87-24433*# National Aeronautics and Space Administration. Langley Research Center, Hampton, Va.
MULTIAxis CONTROL POWER FROM THRUST VECTORING FOR A SUPersonic FIGHTER AIRCRAFT MODEL AT MACH 0.20 TO 2.47
FRANCIS J. CAPONE and E. ANN BARE
 Jul. 1987 264 p
(NASA-TP-2712; L-16213; NAS 1.60:2712) Avail: NTIS HC
A12/MF A01 CSCL 01A
FIGHTER AIRCRAFT, MACH NUMBER, SUPersonic CRUISE AIRCRAFT RESEARCH, THRUST VECTOR CONTROL

N87-25301*# National Aeronautics and Space Administration. Langley Research Center, Hampton, Va.
STUDY OF LEE-SIDE FLOWS OVER CONICALLY CAMBERED DELTA WINGS AT SUPersonic speeds, PART 2
RICHARD M. WOOD and CAROLYN B. WATSON
 Jul. 1987 404 p
(NASA-TP-2660-PT-2; L-16192; NAS 1.60:2660-PT-2) Avail: NTIS HC
A18/MF A01 CSCL 01A
CONICAL CAMBER, DELTA WINGS, FLOW DISTRIBUTION, FLOW VISUALIZATION, SUPersonic FLOW, WING LOADING

N87-25998*# National Aeronautics and Space Administration. Ames Research Center, Moffett Field, Calif.
SUPERCOMPUTING IN AEROSPACE
PAUL KUTLER and HELEN YEE
(NASA-CP-2454; A-87082; NAS 1.55:2454) Avail: NTIS HC
A13/MF A01 CSCL 01A
COMPUTATIONAL ASTROPHYSICS, COMPUTATIONAL CHEMISTRY, COMPUTATIONAL FLUID DYNAMICS, COMPUTATIONAL GRIDS, COMPUTERIZED SIMULATION, CONFERENCES, INTERACTIONAL AERODYNAMICS, NAVIER-STOKES EQUATION, SUPERCOMPRESSIBLE FLOW

N87-26031*# National Aeronautics and Space Administration. Langley Research Center, Hampton, Va.
EFFECT OF REYNOLDS NUMBER VARIATION ON AERODYNAMICS OF A HYDROGEN-FUELED TRANSPORT CONCEPT AT MACH 6
JIM A. PENLAND, JEFFREY A. CUNNINGHAM, and DON C. MARCUM, JR.
 Aug. 1987 28 p
(NASA-TP-2728; L-16286; NAS 1.60:2728) Avail: NTIS HC
A03/MF A01 CSCL 01A
AERODYNAMIC CONFIGURATIONS, HYDROGEN FUELS, HYPERSONIC AIRCRAFT, MACH NUMBER, REYNOLDS NUMBER, TRANSPORT AIRCRAFT

N87-26032*# National Aeronautics and Space Administration. Langley Research Center, Hampton, Va.
STEADY AND UNSTEADY AERODYNAMIC FORCES FROM THE SOUSSA SURFACE-PANEL METHOD FOR A FIGHTER WING WITH TIP MISSILE AND COMPARISON WITH EXPERIMENT AND PAINAIR
HERBERT J. CUNNINGHAM
 Aug. 1987 29 p
(NASA-TP-2736; L-16262; NAS 1.60:2736) Avail: NTIS HC
A03/MF A01 CSCL 01A
AERODYNAMIC FORCES, FIGHTER AIRCRAFT, PANEL METHOD (FLUID DYNAMICS), UNSTEADY FLOW, WINGS

N87-26674*# National Aeronautics and Space Administration. Langley Research Center, Hampton, Va.
SUBSONIC LONgitudinal AND LATERAL-DIRECTIONAL CHARACTERISTICS OF A FORWARD-SWEEP-WING FIGHTER CONFIGURATION AT ANGLES OF ATTACK UP TO 47 DEG
MICHAEL J. MANN, JARRETT K. HUFFMAN, and CHARLES H. FOX, JR.
 Sep. 1987 103 p
(NASA-TP-2727; L-16206; NAS 1.60:2727) Avail: NTIS HC
A06/MF A01 CSCL 01A
AERODYNAMIC CONFIGURATIONS, ANGLE OF ATTACK, FIGHTER AIRCRAFT, LATERAL CONTROL, LATERAL STABILITY, SUBSONIC AIRCRAFT, SWEEP FORWARD WINGS

N87-26683*# National Aeronautics and Space Administration. Langley Research Center, Hampton, Va.
AN EXPERIMENTAL INVESTIGATION OF AN ADVANCED TURBOPROP INSTALLATION ON A SWEPT WING AT SUBSONIC AND TRANSONIC SPEEDS
JOHN R. CARLSON and ODIS C. PENDERGRAFT, JR.
 Sep. 1987 242 p
(NASA-TP-2729; L-16043; NAS 1.60:2729) Avail: NTIS HC
A11/MF A01 CSCL 01A
AERODYNAMICS, ENGINE AIRFRAME INTEGRATION, SUBSONIC SPEED, SWEPT WINGS, TRANSONIC SPEED, TURBOPROP ENGINES
05 AIRCRAFT DESIGN, TESTING AND PERFORMANCE

N87-27622*# National Aeronautics and Space Administration. Langley Research Center, Hampton, Va.
CALCULATION OF VISCOS EFFECTS ON TRANSONIC FLOW FOR OSCILLATING AIRFOILS AND COMPARISONS WITH EXPERIMENT
JAMES T. HOWLETT and SAMUEL R. BLAND Sep. 1987 77 p
(NASA-TP-2731; L-16289; NAS 1.60:2731) Avail: NTIS HC A05/MF A01 CSCL 01A
AIRFOILS, COMPARISON, INVISCID FLOW, OSCILLATIONS, TRANSONIC FLOW, VISCOS FLOW

N87-27626*# National Aeronautics and Space Administration. Langley Research Center, Hampton, Va.
DRAG MEASUREMENTS OF BLUNT STORES TANGENTIALLY MOUNTED ON A FLAT PLATE AT SUPersonic SPEEDS
FLOYD J. WILCOX, JR. Sep. 1987 68 p
(NASA-TP-2742; L-16284; NAS 1.60:2742) Avail: NTIS HC A04/MF A01 CSCL 01A
AERODYNAMIC DRAG, BLUNT BODIES, EXTERNAL STORES, FLAT PLATES, MOUNTING, SUPERSONIC SPEED, TANGENTS

N87-27643*# National Aeronautics and Space Administration. Langley Research Center, Hampton, Va.
PRESSURE MEASUREMENTS ON A THICK CAMBERED AND TWISTED 58 DEG DELTA WING AT HIGH SUBSONIC SPEEDS
JULIO CHU and JOHN E. LAMAR Sep. 1987 233 p
(NASA-TP-2713; L-16224; NAS 1.60:2713) Avail: NTIS HC A11/MF A01 CSCL 01A
CAMBER, DELTA WINGS, PRESSURE MEASUREMENT, SUBSONIC SPEED, THICKNESS, TWISTED WINGS

N87-29432*# National Aeronautics and Space Administration. Ames Research Center, Moffett Field, Calif.
AUTOMATED REDUCTION OF DATA FROM IMAGES AND HOLOGRAMS
(NASA-CP-2477; A-87135; NAS 1.55:2477) Avail: NTIS HC A99/MF A01 CSCL 01A
COMBUSTIBLE FLOW, DIGITAL TECHNIQUES, HOLOGRAPHIC INTERFEROMETRY, IMAGE ANALYSIS, PARTICLE SIZE DISTRIBUTION

N87-29462*# National Aeronautics and Space Administration. Langley Research Center, Hampton, Va.
LOW-SPEED AERODYNAMIC CHARACTERISTICS OF A TWIN-ENGINE GENERAL AVIATION CONFIGURATION WITH AFT-FUSELAGE-MOUNTED PUSHER PROPELLERS
(NASA-TP-2763; L-16331; NAS 1.60:2763) Avail: NTIS HC A06/MF A01 CSCL 01A
AERODYNAMIC CHARACTERISTICS, GENERAL AVIATION AIRCRAFT, LOW SPEED, PROPELLERS, PROPULSION SYSTEM CONFIGURATIONS, PYLON MOUNTING, TURBOPROP ENGINES

03 AIR TRANSPORTATION AND SAFETY

N87-10054*# National Aeronautics and Space Administration. Langley Research Center, Hampton, Va.
DOPPLER RADAR DETECTION OF WIND SHEAR
(NASA-CP-2435; NAS 1.55:2435; FAA/PM-86/31) Avail: NTIS HC A05/MF A01 CSCL 01C
AIRCRAFT HAZARDS, CONFERENCES, DOPPLER RADAR, MICROBURSTS, RADAR MEASUREMENT, WIND SHEAR

N87-22634*# National Aeronautics and Space Administration. Langley Research Center, Hampton, Va.
DRAG MEASUREMENTS OF BLUNT STORES TANGENTIALLY MOUNTED ON A FLAT PLATE AT SUPERSONIC SPEEDS
FLOYD J. WILCOX, JR. Sep. 1987 68 p
(NASA-TP-2742; L-16284; NAS 1.60:2742) Avail: NTIS HC A04/MF A01 CSCL 01A
COMBUSTIBLE FLOW, DIGITAL TECHNIQUES, HOLOGRAPHIC INTERFEROMETRY, IMAGE ANALYSIS, PARTICLE SIZE DISTRIBUTION

N87-11717*# National Aeronautics and Space Administration. Langley Research Center, Hampton, Va.
RECENT EXPERIENCES IN MULTIDISCIPLINARY ANALYSIS AND OPTIMIZATION, PART 1
J. SOBIESKI, comp. 1984 517 p Symposium held in Hampton, Va., 24-26 Apr. 1984
(NASA-CP-2327-PT-1; NAS 1.55:2327-PT-1) Avail: NTIS HC A22/MF A01 CSCL 01C
AIRCRAFT DESIGN, COMPUTER AIDED DESIGN, CONFERENCES, DESIGN ANALYSIS, OPTIMIZATION, STRUCTURAL DESIGN

05 AIRCRAFT DESIGN, TESTING AND PERFORMANCE

Includes aircraft simulation technology.

N87-11717*# National Aeronautics and Space Administration. Langley Research Center, Hampton, Va.
RECENT EXPERIENCES IN MULTIDISCIPLINARY ANALYSIS AND OPTIMIZATION, PART 1
J. SOBIESKI, comp. 1984 517 p Symposium held in Hampton, Va., 24-26 Apr. 1984
(NASA-CP-2327-PT-1; NAS 1.55:2327-PT-1) Avail: NTIS HC A22/MF A01 CSCL 01C
AIRCRAFT DESIGN, COMPUTER AIDED DESIGN, CONFERENCES, DESIGN ANALYSIS, OPTIMIZATION, STRUCTURAL DESIGN

5


N87-16815*# National Aeronautics and Space Administration. Langley Research Center, Hampton, Va. FLIGHT INVESTIGATION OF THE EFFECT OF TAIL CONFIGURATION ON STALL, SPIN, AND RECOVERY CHARACTERISTICS OF A LOW-WING GENERAL AVIATION RESEARCH AIRPLANE H. PAUL STOUGH, JR., JAMES M. PATTON, JR., and STEVEN M. SLIWA Feb. 1987 125 p (NASA-TP-2644; L-16194; NAS 1.60:2644) Avail: NTIS HC A06/MF A01 CSCL 01C AERODYNAMIC CONFIGURATIONS, AERODYNAMIC STALLING, AIRCRAFT SPIN, GENERAL AVIATION AIRCRAFT, RESEARCH AIRCRAFT, TAIL ASSEMBLIES


N87-20990*# National Aeronautics and Space Administration. Ames Research Center, Moffett Field, Calif. SUMMARY OF STUDIES TO REDUCE WING-MOUNTED PROPFAN INSTALLATION DRAG ON AN M = 0.8 TRANSPORT RONALD C. SMITH, ALAN D. LEVIN, and RICHARD D. WOOD May 1987 29 p (NASA-TP-2678; A-86242; NAS 1.60:2678) Avail: NTIS HC A03/MF A01 CSCL 01C DRAG REDUCTION, HIGH SPEED, PROPELLER TECHNOLOGY, TRANSPORT AIRCRAFT, WIND TUNNEL TESTS


N87-24458*# National Aeronautics and Space Administration. Langley Research Center, Hampton, Va. MEASUREMENTS OF FLOW RATE AND TRAJECTORY OF AIRCRAFT TIRE-GENERATED WATER SPRAY ROBERT H. DAUGHERTY and SANDY M. STUBBS Jul. 1987 118 p (NASA-TP-2718; L-16195; NAS 1.60:2718) Avail: NTIS HC A06/MF A01 CSCL 01C AIRCRAFT TIRES, ENGINE INLETS, FLOW VELOCITY, INGESTION (ENGINES), SPLASHING, SPRAYING

N87-26041*# National Aeronautics and Space Administration. Langley Research Center, Hampton, Va. EVALUATION OF INSTALLED PERFORMANCE OF A WING-TIP-MOUNTED PUSHER TURBOPROP ON A SEMISPAN WING JAMES C. PATTERSON, JR. and GLYNN R. BARTLETT Aug. 1987 30 p (NASA-TP-2739; L-16252; NAS 1.60:2739) Avail: NTIS HC A03/MF A01 CSCL 01C INSTALLING, PROPELLERS, SEMISPAN MODELS, TURBOFAN ENGINES, TURBOPROP ENGINES, WING TIP VORTEXES


N87-17694*# National Aeronautics and Space Administration. Langley Research Center, Hampton, Va. APPLICATION OF PARAMETER ESTIMATION TO AIRCRAFT STABILITY AND CONTROL: THE OUTPUT-ERROR APPROACH RICHARD E. MAINE and KENNETH W. ILIFF Jun. 1986 175 p Submitted for publication (NASA-TP-1168; H-1299; NAS 1.61:1168) Avail: NTIS HC A06/MF A01 CSCL 01C The practical application of parameter estimation methodology to the problem of estimating aircraft stability and control derivatives from flight test data is examined. The primary purpose of the
document is to present a comprehensive and unified picture of the entire parameter estimation process and its integration into a flight test program. The document concentrates on the output-error the entire parameter estimation process and its integration into a document is to present a comprehensive and unified picture of equations to the limitations of analysis programs, using a specific derivatives. It then discusses the issues that arise in adapting the suitable for application to estimation of stability and control situations that have arisen. The document first derives the aircraft equations of motion in a form example. The roles and issues relating to mass distribution data, preflight predictions, maneuver design, flight scheduling, instrumentation sensors, data acquisition systems, and data processing are then addressed. Finally, the document discusses evaluation and the use of the analysis results. Author applications of signal conditioning for the most common flight-test data-acquisition systems. A limited amount of theoretical discussion is included to assist the reader in a more complete understanding of the subject matter. Nonspecific signal conditioning, such as amplification, filtering, and multiplexing, is discussed. Signal conditioning for various specific transducers and data terminal devices is also discussed to illustrate signal conditioning that is unique to particular types of transducers. The purpose is to delineate for the reader the various signal-conditioning technique options, together with tradeoff considerations, for commonly encountered flight-test situations. Author

06 AIRCRAFT INSTRUMENTATION

Includes cockpit and cabin display devices; and flight instruments.

N87-10864*# National Aeronautics and Space Administration. Langley Research Center, Hampton, Va.
GROUND-BASED TIME-GUIDANCE ALGORITHM FOR CONTROL OF AIRPLANES IN A TIME-METERED AIR TRAFFIC CONTROL ENVIRONMENT: A PILOTED SIMULATION STUDY C. E. KNOX and N. IMBERT (Office National d'Etudes et de Recherches Aerospatiales, Toulouse, France) Nov. 1986 36 p (NASA-TP-2616; L-16116; NAS 1.60:2616) Avail: NTIS HC A03/MF A01 CSCL 01D
AIR TRAFFIC CONTROL, ENERGY CONSERVATION, FLIGHT MANAGEMENT SYSTEMS, FLIGHT SIMULATION, FUEL CONSUMPTION, PILOTS (PERSONNEL), TIMING DEVICES

N87-13438*# National Aeronautics and Space Administration. Langley Research Center, Hampton, Va.
DEVELOPMENT AND EVALUATION OF AN ELECTRONIC DISPLAY FORMAT ALIGNED WITH THE INERTIAL VELOCITY VECTOR G. O. STEINMETZ Dec. 1986 23 p (NASA-TP-2648; L-16188; NAS 1.60:2648) Avail: NTIS HC A02/MF A01 CSCL 01D
ALIGNMENT, DIRECTIONAL CONTROL, DISPLAY DEVICES, ELECTRONIC EQUIPMENT, FLIGHT TESTS, INERTIAL NAVIGATION, PERFORMANCE TESTS, VELOCITY

N87-19393*# National Aeronautics and Space Administration. Langley Research Center, Hampton, Va.
A SIMULATION EVALUATION OF A PILOT INTERFACE WITH AN AUTOMATIC TERMINAL APPROACH SYSTEM DAVID A. HINTON Apr. 1987 21 p (NASA-TP-2669; L-16222; NAS 1.60:2669) Avail: NTIS HC A02/MF A01 CSCL 17G
APPROACH CONTROL, AUTOMATIC CONTROL, AUTOMATIC PILOTS, GENERAL AVIATION AIRCRAFT, MAN MACHINE SYSTEMS

N87-29533*# National Aeronautics and Space Administration. Ames Research Center, Moffett Field, Calif.
The application of analog signal conditioning to flight-tests data acquisition systems is discussed. Emphasis is placed on practical

07 AIRCRAFT PROPULSION AND POWER

Includes prime propulsion systems and systems components, e.g., gas turbine engines and compressors; and onboard auxiliary power plants for aircraft.

N87-17699*# National Aeronautics and Space Administration. Lewis Research Center, Cleveland, Ohio.
COMPRESSORS, DESIGN ANALYSIS, FLOW DISTRIBUTION, PERFORMANCE TESTS, ROTOR BLADES (TURBOMACHINERY)

N87-20267*# National Aeronautics and Space Administration. Lewis Research Center, Cleveland, Ohio.
COMBUSTION, FLUID DYNAMICS, THERMODYNAMICS

N87-24481*# National Aeronautics and Space Administration. Lewis Research Center, Cleveland, Ohio.
LOW-COST FM OSCILLATOR FOR CAPACITANCE TYPE OF BLADE TIP CLEARANCE MEASUREMENT SYSTEM JOHN P. BARRANGER Jul. 1987 16 p (NASA-TP-2746; E-3455; NAS 1.60:2746) Avail: NTIS HC A02/MF A01 CSCL 21E
BLADE TIPS, ERROR ANALYSIS, FREQUENCY MODULATION, NONDESTRUCTIVE TESTS, OSCILLATORS, ROTOR BLADES (TURBOMACHINERY)
AEROELASTIC CHARACTERISTICS OF AN OBLIQUE-WING AIRCRAFT

Ames Research Center, Moffett Field, Calif.

IN-FLIGHT TOTAL FORCES, MOMENTS AND STATIC AEROELASTIC CHARACTERISTICS OF AN OBLIQUE-WING RESEARCH AIRPLANE

(NASA-TP-2224; H-1181; NAS 1.60:2224) Avail: NTIS HC A03/MF A01 CSCL 01C

AEROELASTIC RESEARCH WINGS, AIRCRAFT DESIGN, FLIGHT TESTS, OBLIQUE WINGS, RESEARCH AIRCRAFT, STRUCTURAL DESIGN, WIND TUNNEL TESTS

N87-10531* National Aeronautics and Space Administration.
Lewis Research Center, Cleveland, Ohio.
ADVANCED DETECTION, ISOLATION AND ACCOMMODATION OF SENSOR FAILURES: REAL-TIME EVALUATION
WALTER C. MERRILL, JOHN C. DELAAT, and WILLIAM M. BRUTON Jul. 1987 30 p
(NASA-TP-2740; E-3479; NAS 1.60:2740) Avail: US Patent and Trademark Office CSCL 01C

ENGINE CONTROL, ENGINE FAILURE, FAULT TOLERANCE, REDUNDANCY ENCODING, REMOTE SENSORS, TURBINE ENGINES

N87-26922* National Aeronautics and Space Administration.
Langley Research Center, Hampton, Va.
PILOTED-SIMULATION STUDY OF EFFECTS OF VORTEX FLAPS ON LOW-SPEED HANDLING QUALITIES OF A DELTA-WING AIRPLANE
JAY M. BRANDON, PHILIP W. BROWN, and ALFRED J. WUNSCHEL Sep. 1987 38 p
(NASA-TP-2747; L-16307; NAS 1.60:2747) Avail: NTIS HC A03/MF A01 CSCL 01C

CONTROLLABILITY, DELTA WINGS, FLIGHT SIMULATION, LOW SPEED, PILOTS (PERSONNEL), VORTEX FLAPS

09

RESEARCH AND SUPPORT FACILITIES (AIR)

Includes airports, hangars and runways; aircraft repair and overhaul facilities; wind tunnels; shock tubes; and aircraft engine test stands.

N87-10875* National Aeronautics and Space Administration.
Washington, D.C.
AERONAUTICAL FACILITIES ASSESSMENT
F. E. PENARANDA, comp. Nov. 1985 204 p
(NASA-RP-1146; NAS 1.61:1146) Avail: NTIS HC A03/MF A01 CSCL 14B

A survey of the free world’s aeronautical facilities was undertaken and an evaluation made on where the relative strengths and weaknesses exist. Special emphasis is given to NASA’s own capabilities and needs. The types of facilities surveyed are: Wind Tunnels; Airbreathing Propulsion Facilities; and Flight Simulators.

Author
15 LAUNCH VEHICLES AND SPACE VEHICLES

12 ASTRONAUTICS (GENERAL)

N87-23662*# National Aeronautics and Space Administration. Lewis Research Center, Cleveland, Ohio. EXPERIMENTAL EVALUATION OF BLOCKAGE RATIO AND PLENUM EVACUATION SYSTEM FLOW EFFECTS ON PRESSURE DISTRIBUTION FOR BODIES OF REVOLUTION IN 0.1 SCALE MODEL TEST SECTION OF NASA LEWIS RESEARCH CENTER'S PROPOSED ALTITUDE WIND TUNNEL RICHARD R. BURLEY and DOUGLAS E. HARRINGTON Apr. 1987 26 p (NASA-TP-2928; E-3367; NAS 1.60:2928) Avail: NTIS HC A03/MF A01 CSCL 14B

HONEYCOMB STRUCTURES, PRESSURE DISTRIBUTION, SCREENS, TURBULENCE EFFECTS, TURBULENT FLOW, WIND TUNNEL CALIBRATION


CRYOGENIC WIND TUNNELS, EVOLUTION (DEVELOPMENT), HISTORIES, TRANSONIC WIND TUNNELS, TWO DIMENSIONAL FLOW


The Langley Research Center has recently upgraded the Landing Loads Track (LLT) to improve the capability of low-cost testing of conventional and advanced landing gear systems. The unique feature of the Langley Aircraft Landing Dynamics Facility (ALDF) is the ability to test aircraft landing gear systems on actual runway surfaces at operational ground speeds and loading conditions. A historical overview of the original LLT is given, followed by a detailed description of the new ALDF systems and operational capabilities.

Author

15 LAUNCH VEHICLES AND SPACE VEHICLES

INCLUDES BOOSTERS; OPERATING PROBLEMS OF LAUNCH/SPACE VEHICLE SYSTEMS; AND REUSABLE VEHICLES.


LARGE SPACE STRUCTURES, LASER APPLICATIONS, SOLAR ARRAYS, SPACE SHUTTLE PAYLOADS, TRACKING (POSITION)


ATMOSPHERIC COMPOSITION, CARBON DIOXIDE, REMOTE SENSING, SPACE PLATFORMS
15 LAUNCH VEHICLES AND SPACE VEHICLES

N87-22702* National Aeronautics and Space Administration. Marshall Space Flight Center, Huntsville, Ala.
STRUCTURAL DYNAMICS AND CONTROL INTERACTION OF FLEXIBLE STRUCTURES
(NASA-CP-2467-PT-1; M-554-PT-1; NAS 1.55:2467-PT-1) Avail: NTIS HC A99/MF E03 CSCL 22B
CONTROL SYSTEMS DESIGN, DYNAMIC STRUCTURAL ANALYSIS, FLEXIBLE BODIES, LARGE SPACE STRUCTURES, SPACECRAFT CONTROL

STRUCTURAL DYNAMICS AND CONTROL INTERACTION OF FLEXIBLE STRUCTURES
(NASA-CP-2467-PT-2; M-554-PT-2; NAS 1.55:2467-PT-2) Avail: NTIS HC A14/MF A01 CSCL 22B
CONFERENCES, DESIGN ANALYSIS, DYNAMIC STRUCTURAL ANALYSIS, FLEXIBLE BODIES, JOINTS (JUNCTIONS), LARGE SPACE STRUCTURES, ORBITAL SPACE STATIONS

16 SPACE TRANSPORTATION
Includes passenger and cargo space transportation, e.g., shuttle operations; and space rescue techniques.

DEVELOPMENT TESTING OF LARGE VOLUME WATER SPRAYS FOR WARM FOG DISPERSAL
(NASA-TP-2607; NAS 1.60:2607) Avail: NTIS HC A06/MA01 CSCL 14B
COALESCING, FOG DISPERSAL, SPACE SHUTTLES, SPACECRAFT LAUNCHING, SPRAY NOZZLES, WATER

18 SPACECRAFT DESIGN, TESTING AND PERFORMANCE
Includes satellites; space platforms; space stations; spacecraft systems and components such as thermal and environmental controls; and attitude controls.

N87-16014* National Aeronautics and Space Administration. Langley Research Center, Hampton, Va.
NASA/DOD CONTROL/STRUCTURES INTERACTION TECHNOLOGY, 1986
ROBERT L. WRIGHT, comp. Nov. 1986 549 p Conference held in Norfolk, Va., 18-21 Nov. 1986; sponsored by NASA Langley Research Center and AFWAL
(NASA-CP-2447-PT-1; L-16242-PT-1; NAS 1.55:2447-PT-1) Avail: NTIS HC A23/MF A01 CSCL 22B
ANTENNAS, CONFERENCES, FLEXIBLE SPACECRAFT, LARGE SPACE STRUCTURES, SPACE STATIONS, SPACECRAFT CONTROL, SPACECRAFT DESIGN, SYSTEMS ENGINEERING, TRUSSES, VIBRATION DAMPING

N87-24495* National Aeronautics and Space Administration. Langley Research Center, Hampton, Va.
NASA/DOD CONTROL/STRUCTURES INTERACTION TECHNOLOGY, 1986
(NASA-CP-2447-PT-2; L-16242-PT-2; NAS 1.55:2447-PT-2) Avail: NTIS HC A14/MF A01 CSCL 22B
CONTROL STABILITY, CONTROL SYSTEMS DESIGN, INTERACTIVE CONTROL, ORBITAL SPACE STATIONS, SPACECRAFT CONTROL, VIBRATION DAMPING

N87-26075* National Aeronautics and Space Administration, Washington, D.C.
SPACE STATION SYSTEMS: A BIBLIOGRAPHY WITH INDEXES (SUPPLEMENT 4)
May 1987 220 p
(NASA-SP-7056(04); NAS 1.21:7056(04)) Avail: NTIS HC A01 CSCL 22B
This bibliography lists 832 reports, articles, and other documents introduced into the NASA scientific and technical information system between July 1, 1986 and December 31, 1986. Its purpose is to provide helpful information to the researcher, manager, and designer in technology development and mission design according to system, interactive analysis and design, structural and thermal analysis and design, structural concepts and control systems, electronics, advanced materials, assembly concepts, propulsion, and solar power satellite systems. The coverage includes documents that define major systems and subsystems, servicing and support requirements, procedures and operations, and missions for the current and future space station. Author

20 SPACECRAFT PROPULSION AND POWER
Includes main propulsion systems and components, e.g., rocket engines; and spacecraft auxiliary power sources.

SOLAR ARRAY FLIGHT EXPERIMENT/DYNAMIC AUGMENTATION EXPERIMENT
LEIGHTON E. YOUNG and HOMER C. PACK, JR. Feb. 1987 72 p
(NASA-TP-2690; NAS 1.60:2690) Avail: NTIS HC A04/MF A01 CSCL 10A
LARGE SPACE STRUCTURES, SOLAR ARRAYS, SOLAR DYNAMIC POWER SYSTEMS, SPACE ERECTABLE STRUCTURES, SPACE SHUTTLE PAYLOADS

N87-20381* National Aeronautics and Space Administration. Lewis Research Center, Cleveland, Ohio.
EXPERIMENTAL THRUST PERFORMANCE OF A HIGH-AREA-RATIO ROCKET NOZZLE
(NASA-TP-2720; E-3236-1; NAS 1.60:2720) Avail: NTIS HC A02/MP A01 CSCL 21H
AREA, NOZZLE GEOMETRY, ROCKET NOZZLES, ROCKET THRUST
STRUCTURAL INTEGRITY AND DURABILITY OF REUSABLE SPACE PROPULSION SYSTEMS

1987 205 p Conference held in Cleveland, Ohio, 12-13 May 1987 (NASA-CP-2471; E-3512; NAS 1.55:2471) Avail: NTIS HC A10/MF A01 CSCL 21H
AEROTHERMODYNAMICS, CONFERENCES, DURABILITY, DYNAMIC STRUCTURAL ANALYSIS, FATIGUE (MATERIALS), FRACTURE MECHANICS, SPACE SHUTTLE MAIN ENGINE, SPACECRAFT PROPULSION, STRUCTURAL RELIABILITY

COMPARISON OF THEORETICAL AND EXPERIMENTAL THRUST PERFORMANCE OF A 1030:1 AREA RATIO ROCKET NOZZLE AT A CHAMBER PRESSURE OF 2413 KN/M2 (350 PSIA)

ENGINE TESTS, PREDICTIONS, ROCKET NOZZLES, ROCKET THRUST

EXPERIMENTAL EVALUATION OF HEAT TRANSFER ON A 1030:1 AREA RATIO ROCKET NOZZLE

EXHAUST NOZZLES, HEAT FLUX, HEAT TRANSFER, NOZZLE FLOW, ROCKET NOZZLES, WALL TEMPERATURE

PRELIMINARY STRUCTURAL DESIGN OF COMPOSITE MAIN ROTOR BLADES FOR MINIMUM WEIGHT

BLADES, COMPOSITE MATERIALS, DYNAMIC STRUCTURAL ANALYSIS, HELICOPTERS, ROTORS, WEIGHT REDUCTION

THE ACEE PROGRAM AND BASIC COMPOSITES RESEARCH AT LANGLEY RESEARCH CENTER (1975 TO 1986): SUMMARY AND BIBLIOGRAPHY

Composites research conducted at the Langley Research Center during the period from 1975 to 1986 is described, and an annotated bibliography of over 600 documents (with their abstracts) is presented. The research includes Langley basic technology and the composite primary structures element of the NASA Aircraft Energy Efficiency (ACEE) Program. The basic technology documents cited in the bibliography are grouped according to the research activity such as design and analysis, fatigue and fracture, and damage tolerance. The ACEE documents cover development of composite structures for transport aircraft.

CHEMISTRY AND MATERIALS (GENERAL)

SPECTROSCOPIC COMPARISON OF EFFECTS OF ELECTRON RADIATION ON MECHANICAL PROPERTIES OF TWO POLYIMIDES

EDWARD R. LONG, JR. and SHEILA ANN T. LONG Apr. 1987 21 p (NASA-TP-2663; L-16200; NAS 1.60:2663) Avail: NTIS HC A02/MF A01 CSCL 11C
DURABILITY, ELECTRON RADIATION, KAPTON (TRADE-MARK), RADIATION DAMAGE, TENSILE PROPERTIES

EXHAUST NOZZLES, HEAT FLUX, HEAT TRANSFER, NOZZLE FLOW, ROCKET NOZZLES, WALL TEMPERATURE

ANALYSIS OF QUASI-HYBRID SOLID ROCKET BOOSTER CONCEPTS FOR ADVANCED EARTH-TO-ORBIT VEHICLES

FEASIBILITY ANALYSIS, HYBRID PROPELLANT ROCKET ENGINES, SPACE SHUTTLE BOOSTERS

ANALYSIS OF QUASI-HYBRID SOLID ROCKET BOOSTER CONCEPTS FOR ADVANCED EARTH-TO-ORBIT VEHICLES

Includes physical, chemical, and mechanical properties of laminates and other composite materials.

EFFECTS OF THERMAL CYCLING ON GRAPHITE-FIBER-REINFORCED 6061 ALUMINUM

ALUMINUM GRAPHITE COMPOSITES, CARBON FIBERS, METAL MATRIX COMPOSITES, REINFORCING FIBERS, SPACECRAFT STRUCTURES, THERMAL CYCLING TESTS

COMPOSITE MATERIALS
25  INORGANIC AND PHYSICAL CHEMISTRY

INORGANIC AND PHYSICAL CHEMISTRY

Includes chemical analysis, e.g., chromatography; combustion theory; electrochemistry; and photochemistry.

N87-18629*  National Aeronautics and Space Administration. Langley Research Center, Hampton, Va.
ELECTRON STIMULATED DESORPTION OF ATOMIC OXYGEN FROM SILVER
(NASA-TP-2668; L-16225; NAS 1.60:2668) Avail: NTIS HC A02/MF A01 CSCL 07D

ATOMIC BEAMS, DESORPTION, ELECTRON EMISSION, OXYGEN, SILVER, STIMULATED EMISSION

26  METALLIC MATERIALS

Includes physical, chemical, and mechanical properties of metals, e.g., corrosion; and metallurgy.

N87-16902*  National Aeronautics and Space Administration. Lewis Research Center, Cleveland, Ohio.
CONVENTIONALLY CAST AND FORGED COPPER ALLOY FOR HIGH-HEAT-FLUX THRUST CHAMBERS
(NASA-TP-2694; E-3304; NAS 1.60:2694) Avail: NTIS HC A02/MF A01 CSCL 11F

COMBUSTION CHAMBERS, COPPER ALLOYS, HEAT FLUX, HIGH TEMPERATURE, LININGS, SPACE SHUTTLE MAIN ENGINE

N87-18644*  National Aeronautics and Space Administration. Langley Research Center, Hampton, Va.
EFFECT OF LID (REGISTERED) PROCESSING ON THE MICROSTRUCTURE AND MECHANICAL PROPERTIES OF Ti-6Al-4V AND Ti-6Al-2Sn-4Zr-2Mo TITANIUM FOIL-GAUGE MATERIALS
(NASA-TP-2677; L-16098; NAS 1.60:2677) Avail: NTIS HC A03/MF A01 CSCL 11F

BONDING, DIFFUSION, INTERFACES, LIQUIDS, MECHANICAL PROPERTIES, MICROSTRUCTURE, PROTECTIVE COATINGS, TITANIUM ALLOYS

THE CORROSION MECHANISMS FOR PRIMER COATED 2219-T87 ALUMINUM
(NASA-TP-2755; L-16305; NAS 1.60:2755) Avail: NTIS HC A02/MF A01 CSCL 11F

ALUMINUM ALLOYS, CORROSION RESISTANCE, PRIMERS (COATINGS), PROTECTIVE COATINGS

HYDROGEN TRAPPING AND THE INTERACTION OF HYDROGEN WITH METALS
(NASA-TP-2744; NAS 1.60:2744) Avail: NTIS HC A03/MF A01 CSCL 11F

CRYSTAL LATTICES, GAS-METAL INTERACTIONS, HYDROGEN, TRAPPING

27  NONMETALLIC MATERIALS

Includes physical, chemical, and mechanical properties of plastics, elastomers, lubricants, polymers, textiles, adhesives, and ceramic materials.

N87-12680*  National Aeronautics and Space Administration. Langley Research Center, Hampton, Va.
INVESTIGATION OF THE EFFECTS OF COBALT IONS ON EPOXY PROPERTIES
(NASA-TP-2639; L-16196; NAS 1.60:2639) Avail: NTIS HC A02/MF A01 CSCL 11G

COBALT, EPOXY RESINS, INVESTIGATION, IONS, MECHANICAL PROPERTIES

N87-18666*  National Aeronautics and Space Administration. Lewis Research Center, Cleveland, Ohio.
ESTER OXIDATION ON AN ALUMINUM SURFACE USING CHEMILUMINESCENCE
(NASA-TP-2611; L-16247; NAS 1.60:2611) Avail: NTIS HC A02/MF A01 CSCL 11B

ALUMINUM ALLOYS, CHEMILUMINESCENCE, ESTERS, METAL SURFACES, OXIDATION
33 ELECTRONICS AND ELECTRICAL ENGINEERING

ELECTRONICS AND ELECTRICAL ENGINEERING

Includes test equipment and maintainability; components, e.g., tunnel diodes and transistors; microminiaturization; and integrated circuitry.

N87-11072*# National Aeronautics and Space Administration.
Goddard Space Flight Center, Greenbelt, Md.
THE 1985 GODDARD SPACE FLIGHT CENTER BATTERY WORKSHOP
G. MORROW, ed. Sep. 1986 427 p Workshop held in Greenbelt, Md., 19-21 Nov. 1985
(NASA-CP-2434; REPT-86B0366; NAS 1.55:2434) Avail: NTIS HC A19/MF A01 CSCL 09A
CONFERENCES, ENERGY STORAGE, LITHIUM SULFUR BATTERIES, NICKEL CADMIUM BATTERIES, NICKEL HYDROGEN BATTERIES

N87-17990*# National Aeronautics and Space Administration.
Lewis Research Center, Cleveland, Ohio.
PERFORMANCE OF TEXTURED CARBON ON COPPER ELECTRODE MULTISTAGE DEPRESSED COLLECTORS WITH MEDIUM-POWER TRAVELING WAVE TUBES
PETER RAMINS and ARTHUR N. CURREN Nov. 1986 12 p
(NASA-TP-2665; E-3143; NAS 1.60:2665) Avail: NTIS HC A02/MF A01 CSCL 09A
ACCUMULATORS, CURRENT DENSITY, ELECTRODES, ELECTRON EMISSION, TRAVELING WAVE TUBES

N87-17991*# National Aeronautics and Space Administration.
Lewis Research Center, Cleveland, Ohio.
CALCULATION OF SECONDARY ELECTRON TRAJECTORIES IN MULTISTAGE DEPRESSED COLLECTORS FOR MICROWAVE AMPLIFIERS
DALE A. FORCE Nov. 1986 7 p
(NASA-TP-2664; E-3198; NAS 1.60:2664) Avail: NTIS HC A02/MF A01 CSCL 09A
ACCUMULATORS, ELECTRON EMISSION, MICROWAVE AMPLIFIERS, PARTICLE TRAJECTORIES, TRAVELING WAVE TUBES

N87-20474*# National Aeronautics and Space Administration.
Lewis Research Center, Cleveland, Ohio.
DESIGN, FABRICATION AND PERFORMANCE OF SMALL GRAPHITE ELECTRODE, MULTISTAGE DEPRESSED COLLECTORS WITH 200-W, CW, 8-TO 18-GHZ TRAVELING-WAVE TUBES
BEN T. EBIHARA and PETER RAMINS Feb. 1987 22 p
(NASA-TP-2693; E-3099; NAS 1.60:2693) Avail: NTIS HC A02/MF A01 CSCL 09A
ACCUMULATORS, DESIGN ANALYSIS, ELECTRODES, FABRICATION, PYROLYTIC GRAPHITE, TRAVELING WAVE TUBES

N87-21239*# National Aeronautics and Space Administration.
Lewis Research Center, Cleveland, Ohio.
TRAVELING-WAVE-TUBE EFFICIENCY IMPROVEMENT BY A LOW-COST TECHNIQUE FOR DEPOSITION OF CARBON ON MULTISTAGE DEPRESSED COLLECTOR
BEN T. EBIHARA, PETER RAMINS, and SHELLY PEET May 1987 14 p
(NASA-TP-2719; E-3416; NAS 1.60:2719) Avail: NTIS HC A02/MF A01 CSCL 09A
CARBON, COPPER, DEPOSITION, ELECTRODES, THIN FILMS, TRAVELING WAVE TUBES

N87-22923*# National Aeronautics and Space Administration.
Lewis Research Center, Cleveland, Ohio.
REVISED NASA AXIALLY SYMMETRIC RING MODEL FOR COUPLED-CAVITY TRAVELING-WAVE TUBES
JEFFREY D. WILSON Jan. 1987 17 p
(NASA-TP-2675; E-3220; NAS 1.60:2675) Avail: NTIS HC A02/MF A01 CSCL 09A
AXISYMMETRIC BODIES, CAVITIES, COUPLED MODES, MODELS, RINGS, TRAVELING WAVE TUBES

N87-25532*# National Aeronautics and Space Administration.
Lewis Research Center, Cleveland, Ohio.
ANALYTICAL AND EXPERIMENTAL PERFORMANCE OF A DUAL-MODE TRAVELING WAVE TUBE AND MULTISTAGE DEPRESSED COLLECTOR
PETER RAMINS, DALE A. FORCE, and HENRY G. KOSMAHL Aug. 1987 29 p
(NASA-TP-2752; E-3470; NAS 1.60:2752) Avail: NTIS HC A03/MF A01 CSCL 09A
ACCUMULATORS, ELECTRON BEAMS, TRAVELING WAVE TUBES

34 FLUID MECHANICS AND HEAT TRANSFER

Includes boundary layers; hydrodynamics; fluids; mass transfer; and ablation cooling.

N87-11963*# National Aeronautics and Space Administration.
Langley Research Center, Hampton, Va.
ON THE MAXWELLIAN DISTRIBUTION, SYMMETRIC FORM, AND ENTROPY CONSERVATION FOR THE EULER EQUATIONS
S. M. DESHPANDE Nov. 1986 30 p
(NASA-TP-2583; L-16036; NAS 1.60:2583) Avail: NTIS HC A03/MF A01 CSCL 20D
ENTROPY, EULER EQUATIONS OF MOTION, MAXWELL-BOLTZMANN DENSITY FUNCTION

N87-13664*# National Aeronautics and Space Administration.
Langley Research Center, Hampton, Va.
AEROTHERMAL TESTS OF SPHERICAL DOME PROTUBERANCES ON A FLAT PLATE AT A MACH NUMBER OF 6.5.
C. E. GLASS and L. R. HUNT Dec. 1986 61 p
(NASA-TP-2631; L-16160; NAS 1.60:2631) Avail: NTIS HC A04/MF A01 CSCL 20D
AEROTHERMODYNAMICS, HYPERSONIC VEHICLES, LAMINAR BOUNDARY LAYER, PREDICTION ANALYSIS TECHNIQUES, PROTUBERANCES, THERMAL PROTECTION, TILES, TURBULENT BOUNDARY LAYER

N87-17000*# National Aeronautics and Space Administration.
Marshall Space Flight Center, Huntsville, Ala.
SPACE SHUTTLE MAIN ENGINE HIGH PRESSURE FUEL PUMP AFT PLATFORM SEAL CAVITY FLOW ANALYSIS
(NASA-TP-2685; NAS 1.60:2685) Avail: NTIS HC A07/MF A01 CSCL 20D
CAVITIES, FUEL PUMPS, HIGH PRESSURE, SEALS (STOPPERS), SPACE SHUTTLE MAIN ENGINE, TURBINE PUMPS
Aerospace Environment,
34 FLUID MECHANICS AND HEAT TRANSFER

N87-29778# National Aeronautics and Space Administration. Langley Research Center, Hampton, Va.
DESCRIPTION AND CALIBRATION OF THE LANGLEY HYPERSONIC CF4 TUNNEL: A FACILITY FOR SIMULATING LOW GAMMA FLOW AS OCCURS FOR A REAL GAS
RAYMOND E. MIDDEN and CHARLES G. MILLER, III Mar. 1985 78 p
(NASA-TM-2384; L-15798; NAS 1.60:2384) Avail: NTIS HC A05/MF A01 CSCL 300
CALIBRATING, CARBON TETRAFLUORIDE, HYPERSONIC WIND TUNNELS, MACH NUMBER, REAL GASES, TEST FACILITIES

N87-29795# National Aeronautics and Space Administration. Ames Research Center, Moffett Field, Calif.
FINITE-ELEMENT REENTRY HEAT-TRANSFER ANALYSIS OF SPACE SHUTTLE ORBITER
WILLIAM L. KO, ROBERT D. QUINN, and LESLIE GONG Dec. 1986 59 p
(NASA-TP-2657; H-1236; NAS 1.60:2657) Avail: NTIS HC A04/MF A01 CSCL 20E
AERODYNAMIC HEATING, FINITE ELEMENT METHOD, HEAT TRANSFER COEFFICIENTS, REENTRY SHIELDING, SPACE SHUTTLE ORBITERS, THERMAL ANALYSIS

35 INSTRUMENTATION AND PHOTOGRAPHY
Includes remote sensors; measuring instruments and gages; detectors; cameras and photographic supplies; and holography.

N87-10263# National Aeronautics and Space Administration. Lewis Research Center, Cleveland, Ohio.
Workshop held in Hampton, Va., 10-12 Jun. 1986
(NASA-CP-2456; L-16271; NAS 1.55:2456) Avail: NTIS HC A13/MF A01 CSCL 20E
CARBON DIOXIDE LASERS, CLOSED CYCLES, FREQUENCY STABILITY, RESEARCH MANAGEMENT

36 LASERS AND MASERS
Includes parametric amplifiers.

N87-20522# National Aeronautics and Space Administration. Langley Research Center, Hampton, Va.
CLOSED-CYCLE, FREQUENCY-STABLE CO2 LASER TECHNOLOGY
Avail: NTIS HC A15/MF A01 CSCL 20E
FREQUENCY STABILITY, RESEARCH MANAGEMENT

37 MECHANICAL ENGINEERING
Includes auxiliary systems (nonpower); machine elements and processes; and mechanical equipment.

N87-10391# National Aeronautics and Space Administration. Lewis Research Center, Cleveland, Ohio.
TESTING OF UH-60A HELICOPTER TRANSMISSION IN NASA LEWIS 2240-KW (3000-HP) FACILITY
A. M. MITCHELL, F. B. OSWALD, and H. H. COE Jun. 1986 30 p
(NASA-TP-2626; E-2941; NAS 1.60:2626) Avail: NTIS HC A03/MF A01 CSCL 20E
VIBRATION MEASUREMENT

N87-18095# National Aeronautics and Space Administration. Lewis Research Center, Cleveland, Ohio.
PREDICTED EFFECT OF DYNAMIC LOAD ON PITTING FATIGUE LIFE FOR LOW-CONTACT-RATIO SPUR GEARS
DAVID G. LEWICKI Jun. 1986 19 p
(NASA-TP-2610; E-2989; NAS 1.60:2610; AD-A170906; AVSCOM-TR-86-C-21) Avail: NTIS HC A03/MF A01 CSCL 13I
APPLICATIONS PROGRAMS (COMPUTERS), DYNAMIC LOADING, DAMAGE (FATIGUE), GEARS, LIFE (DURABILITY), PITTING

N87-18821# National Aeronautics and Space Administration, Washington, D.C.
TETHER DYNAMICS SIMULATION
Feb. 1987 338 p
Workshop held in Arlington, Va., 16 Sep. 1986
(NASA-CP-2458; NAS 1.55:2458) Avail: NTIS HC A15/MF A01 CSCL 22B
Computerized simulation, electrodynamics, tethered satellites, tetherlines
39 STRUCTURAL MECHANICS

N87-20555* National Aeronautics and Space Administration. Lewis Research Center, Cleveland, Ohio. VIBRATION CHARACTERISTICS OF OH-58A HELICOPTER MAIN ROTOR TRANSMISSION DAVID G. LEWICKI and JOHN J. COY Apr. 1987 18 p (NASA-TP-2705; E-3368; NAS 1.60:2705; AVSCOM-TR-86-C-42; AD-A180364) Avail: NTIS HC A01/MF A01 CSCL 01C HELICOPTERS, ROTOR AERODYNAMICS, TRANSMISSIONS (MACHINE ELEMENTS), VIBRATION MEASUREMENT


N87-22235* National Aeronautics and Space Administration. Lewis Research Center, Cleveland, Ohio. GEAR TOOTH STRESS MEASUREMENTS ON THE UH-60A HELICOPTER TRANSMISSION FRED B. OSWALD Mar. 1987 17 p (NASA-TP-2658; E-3557; NAS 1.60:2658) Avail: NTIS HC A02/MF A01 CSCL 13I GEAR TEETH, STRESS MEASUREMENT, TRANSMISSIONS (MACHINE ELEMENTS), UH-60A HELICOPTER

38 QUALITY ASSURANCE AND RELIABILITY

Includes product sampling procedures and techniques; and quality control.


39 STRUCTURAL MECHANICS

Includes structural element design and weight analysis; fatigue; and thermal stress.


N87-16321* National Aeronautics and Space Administration. Lewis Research Center, Cleveland, Ohio. THE 20TH AEROSPACE MECHANICS SYMPOSIUM May 1986 316 p Symposium held in Cleveland, Ohio, 7-9 May 1986; sponsored by NASA, the California Inst. of Tech. and LMSC (NASA-CP-2423-REV; E-2904; NAS 1.55:2423-REV) Avail: NTIS HC A14/MF A01 CSCL 20K ACTUATORS, CONFERENCES, FLEXIBLE SPACECRAFT, HYDRAULIC EQUIPMENT, JOINTS (JUNCTIONS), MANIPULATORS, SPACE STATIONS, SPACECRAFT INSTRUMENTS, SPATTERING, TRIBOLOGY

Gerald A. Carek

42

GEOSCIENCES (GENERAL)

48

EARTH RESOURCES AND REMOTE SENSING

Includes remote sensing of earth resources by aircraft and spacecraft; photogrammetry; and aerial photography.

59

EARTH RESOURCES: A CONTINUING BIBLIOGRAPHY WITH INDEXES (ISSUE 54)

This bibliography lists 562 reports, articles, and other documents introduced into the NASA scientific and technical information system between April 1 and June 30, 1987. Emphasis is placed on the use of remote sensing and geophysical instrumentation in spacecraft and aircraft to survey and inventory natural resources and urban areas. Subject matter is grouped according to agriculture and forestry, environmental changes and cultural resources, geodesy and cartography, geology and mineral resources, hydrology and water management, data processing and distribution.
systems, instrumentation and sensors, and economic analysis.

Author

N87-28162*# National Aeronautics and Space Administration. Langley Research Center, Hampton, Va.

**EFFECTS OF AEROSOLS AND SURFACE SHADOWING ON BIDIRECTIONAL REFLECTANCE MEASUREMENTS OF DESERTS**

DAVID E. BOWKER and RICHARD E. DAVIS Sep. 1987 26 p (NASA-TP-2756; L-16327; NAS 1.60:2756) Avail: NTIS HC A03/MF A01 CSCL 04A

AEROSOLS, BIDIRECTIONAL REFLECTANCE, DESERTS, DUST, REMOTE SENSING, SHADOWS, SURFACE PROPERTIES

N87-28955*# National Aeronautics and Space Administration. Langley Research Center, Hampton, Va.

**ATLAS OF ABSORPTION LINES FROM 0 TO 17900 CM(SUP)-1**


(AUTHOR)

ATMOSPHERIC ANDES, BIDIRECTIONAL REFLECTANCE, DESERTS, DUST, REMOTE SENSING, SHADOWS, SURFACE PROPERTIES

Author

44

**ENERGY PRODUCTION AND CONVERSION**

Includes specific energy conversion systems, e.g., fuel cells; global sources of energy; geophysical conversion; and windpower.

N87-29914*# National Aeronautics and Space Administration. Lewis Research Center, Cleveland, Ohio.

**SPACE ELECTROCHEMICAL RESEARCH AND TECHNOLOGY 1987**

Jun. 1987 364 p Conference held in Cleveland, Ohio, 14-15 Apr. 1987

(AUTHOR)

ATMOSPHERIC COMPOSITION, HYDROGEN PEROXIDE, HYDROXYL RADICALS, TROPOSPHERE, WATER

N87-11358*# National Aeronautics and Space Administration. Langley Research Center, Hampton, Va.

**AIRBORNE LIDAR MEASUREMENTS OF EL CHICHON STRATOSPHERIC AEROSOLS, MAY 1983**


An experimental survey flight to determine the spatial distribution and aerosol characteristics of the El Chichon-produced stratospheric aerosol was conducted in May 1983. The mission included several different sensors flown aboard the NASA Convair 990 at latitudes between 72 deg. and 56 deg. S. This report presents the lidar data from that flight mission. Representative profiles of lidar backscatter ratio, plots of integrated backscattering function versus latitude, and contours of backscatter mixing ratio versus altitude and latitude are given. In addition, tables containing numerical values of the backscatter ratio and backscattering function versus altitude are supplied for each profile. By May 1983, material produced by the El Chichon eruptions of late March-early April 1982 had spread throughout the latitudes covered by this mission. However, the most massive portion of the material resided north of 33 deg. N and was concentrated below 21 km. In this latitude region (33 deg. N to 72 deg. S), peak backscatter ratios at a wavelength of 0.5943 microns varied between 3.5 and 4.5, and the peak integrated backscattering function was about 18 X 10 to the -4 power/sr, corresponding to a peak optical depth calculated to be approximately 0.08. This report presents the results of this mission in a ready-to-use format for atmospheric and climatic studies.

Author

N87-13022*# National Aeronautics and Space Administration. Langley Research Center, Hampton, Va.

**DESCRIPTION OF DATA ON THE NIMBUS 7 LIMS MAP ARCHIVE TAPE: OZONE AND NITRIC ACID**


INFRARED DETECTORS, KALMAN FILTERS, NIMBUS 7 SATELLITE, NITRIC ACID, OZONE, STRATOSPHERE

N87-15528*# National Aeronautics and Space Administration. Langley Research Center, Hampton, Va.

**FUTURE DIRECTIONS FOR H SUB X 0 SUB Y DETECTION**


ATMOSPHERIC COMPOSITION, HYDROGEN PEROXIDE, HYDROXYL RADICALS, TROPOSPHERE, WATER

N87-17417*# National Aeronautics and Space Administration. Langley Research Center, Hampton, Va.

**SPACE AEROSOL MEASUREMENTS. VOLUME 3: JANUARY 1, 1981 TO NOVEMBER 18, 1981**

M. PATRICK MCCORMICK Feb. 1987 274 p (NASA-CP-1173; L-16177; NAS 1.61:1173) Avail: NTIS HC A12/MF A01 CSCL 04A

The Stratospheric Aerosol and Gas Experiment (SAGE) satellite system, launched February 18, 1979, obtained profiles of aerosol extinction at 0.50 micron and 0.45 micron ozone concentration, and nitrogen dioxide concentration. Data taken during sunset events are presented in the form of zonal and seasonal averages of

19
aerosol extinction at 1.00 micron and 0.45 micron, ratios of aerosol extinction to molecular extinction at 1.00 micron and ratios of aerosol extinction at 0.45 micron to aerosol extinction at 1.00 micron. Averages for 1981 are shown in tables, and in profile and contour plots (as a function of altitude and latitude). In addition, temperature data provided by NOAA for the time and location of each SAGE measurement are averaged and shown in a similar format. The stratospheric aerosol distribution for 1981 shows effects of volcanically injected material from eruptions of Llavan, Alaid, and Pagan. Peak values of aerosol extinction at 0.45 micron and 1.00 micron were 2 to 4 times higher than typical peak values observed during near background conditions. Stratospheric aerosol optical depth values at 1.00 microns increased by a factor of about 2 from near background levels in regions of volcanic activity. During the year, these values ranged from between 0.001 and 0.006. The largest were near the location of a recent eruption. The distribution of the ratio of aerosol to molecular extinction at 1.00 microns also showed that maximum values are found in the vicinity of an eruption. These maximums varied in altitude, but remained below a height of about 25 km. No attempt has been made to give detailed explanations or interpretations of these data. The report is intended to provide, in a ready-to-use visual format, representative zonal and seasonal averages of aerosol extinction data for the third calendar year of the SAGE data set to facilitate atmospheric and climatic studies.

Author

N87-18248*# National Aeronautics and Space Administration. Langley Research Center, Hampton, Va.

SPACE OPPORTUNITIES FOR TROPOSPHERIC CHEMISTRY RESEARCH

AEROSOLS, AIR POLLUTION, ATMOSPHERIC CHEMISTRY, ATMOSPHERIC COMPOSITION, CONFERENCES, GASES, REMOTE SENSING, TROPOSPHERE

N87-20663*# National Aeronautics and Space Administration. Langley Research Center, Hampton, Va.

AIRBORNE LIDAR MEASUREMENTS OF EL CHICHON STRATOSPHERIC AEROSOLS, JANUARY 1984
M. PATRICK MCCORMICK and M. T. OSBORN (ST Systems Corp., Hampton, Va.) Apr. 1987 49 p (NASA-RP-1175; L-16234; NAS 1.61:1175) Avail: NTIS HC A03/MF A01 CSCL 04A

A lidar-equipped NASA Electra aircraft was flown in January 1984 between the latitude of 38 and 90 deg. N. One of the primary purposes of this mission was to determine the spatial distribution and aerosol characteristics of El Chichon produced stratospheric material. Lidar data from that portion of the flight mission between 38 deg N and 77 deg N is presented. Representative profiles of lidar backscatter ratio, a plot of the integral backscattering function versus latitude, and contours of backscatter mixing ratio versus altitude and latitude are given. In addition, tables containing numerical values of the backscatter ratio and backscattering function versus altitude are applied for each profile. These data clearly show that material produced by the El Chichon eruptions of late March-early April 1982 had spread throughout the latitudes covered by this mission, and that the most massive portion of the material resided north of 55 deg N and was concentrated below 17 km in a layer that peaked at 13 to 15 km. In this latitude region, peak backscatter ratios at a wavelength of 0.6943 microns were approximately 3 and the peak integrated backscattering function was about 15 X 10 to the -10th corresponding to a peak optical depth of approximately 0.07. This report presents the results of this mission in a ready-to-use format for atmospheric and climatic studies.

Author


UPPER AND MIDDLE ATMOSPHERIC DENSITY MODELING REQUIREMENTS FOR SPACECRAFT DESIGN AND OPERATIONS

AEROSPACE ENVIRONMENTS, ATMOSPHERIC DENSITY, ATMOSPHERIC MODELS, SPACECRAFT DESIGN, THERMOSPHERE

47

METEOROLOGY AND CLIMATOLOGY

Includes weather forecasting and modification.

N87-12086*# National Aeronautics and Space Administration. Wallops Flight Center, Wallops Island, Va.

PRELIMINARY ESTIMATES OF RADIOSONDE THERMISTOR ERRORS

ERROR ANALYSIS, RADIOSONDES, THERMISTORS

N87-13043*# National Aeronautics and Space Administration. Marshall Space Flight Center, Huntsville, Ala.

NASA/MSFC FY-85 ATMOSPHERIC PROCESSES RESEARCH REVIEW

ATMOSPHERIC ELECTRICITY, ATMOSPHERIC SOUNDING, DATA PROCESSING, DOPPLER RADAR, GEOPHYSICS, MESOSCALE PHENOMENA, OPTICAL RADAR, SATELLITE IMAGERY, THUNDERSTORMS, WIND (METEOROLOGY)

N87-20701*# National Aeronautics and Space Administration. Goddard Space Flight Center, Greenbelt, Md.

ON REQUIREMENTS FOR A SATELLITE MISSION TO MEASURE TROPICAL RAINFALL

Tropical rainfall data are crucial in determining the role of tropical latent heating in driving the circulation of the global atmosphere. Also, the data are particularly important for testing the realism of climate models, and their ability to simulate and predict climate accurately on the seasonal time scale. Other scientific issues such as the effects of El Nino on climate could be addressed with a reliable, extended time series of tropical rainfall observations. A passive microwave sensor is planned to provide information on the integrated column precipitation content, its areal distribution, and its intensity. An active microwave sensor (radar) will define the layer depth of the precipitation and provide information about the intensity of rain reaching the surface, the key to determining the latent heat input to the atmosphere. A visible/infrared sensor will provide very high resolution information on cloud coverage, type, and top temperatures and also serve as the link between these data and the long and virtually continuous coverage by the geosynchronous meteorological satellites. The unique combination of sensor wavelengths, coverages, and resolving capabilities
together with the low-altitude, non-Sun synchronous orbit provide a sampling capability that should yield monthly precipitation amounts to a reasonable accuracy over a 500- by 500-km grid.

**N87-22341** National Aeronautics and Space Administration. Langley Research Center, Hampton, Va.

ATMOSPHERIC TURBULENCE RELATIVE TO AVIATION, MISSILE, AND SPACE PROGRAMS


AIRCRAFT SAFETY, ATMOSPHERIC MODELS, ATMOSPHERIC TURBULENCE, CONFERENCES, MISSILES, SPACE PROGRAMS, WEATHER FORECASTING

**N87-26489** National Aeronautics and Space Administration. Langley Research Center, Hampton, Va.

ATMOSPHERIC TURBULENCE RELATIVE TO AVIATION, MISSILE, AND SPACE PROGRAMS


AIRCRAFT SAFETY, ATMOSPHERIC MODELS, ATMOSPHERIC TURBULENCE, CONFERENCES, MISSILES, SPACE PROGRAMS, WEATHER FORECASTING

**N87-25996** National Aeronautics and Space Administration. Goddard Space Flight Center, Greenbelt, Md.

FIVE YEAR GLOBAL DATASET: NMC OPERATIONAL ANALYSES (1978 TO 1982)

DAVID STRAUS and JOSEPH ARIZZONE Sep. 1987 50 p Prepared in cooperation with Sigma Data Services Corp., Rockville, Md. (NASA-SP-1194; REPT-87B0273; NAS 1.61:1194) Avail: NTIS HC A02/MF A01 CSCL 04B

This document describes procedures used in assembling a five year dataset (1978 to 1982) using NMC Operational Analysis data. These procedures entailed replacing missing and unacceptable data in order to arrive at a complete dataset that is continuous in time. In addition, a subjective assessment on the integrity of all data (both preliminary and final) is presented. Documentation on tapes comprising the Five Year Global Dataset is also included.

**N87-24870** National Aeronautics and Space Administration. Goddard Space Flight Center, Greenbelt, Md.

ARCTIC SEA ICE, 1973-1976: SATELLITE PASSIVE-MICROWAVE OBSERVATIONS


The Arctic region plays a key role in the climate of the earth. The sea ice cover affects the radiative balance of the earth and radically changes the fluxes of heat between the atmosphere and the ocean. The observations of the Arctic made by the Electrically Scanning Microwave Radiometer (ESMR) on board the Nimbus 5 research satellite are summarized for the period 1973 through 1976.

**51**

LIFE SCIENCES (GENERAL)

**N87-20727** National Aeronautics and Space Administration. Marshall Space Flight Center, Huntsville, Ala.

LIQUID DROP STABILITY FOR PROTEIN CRYSTAL GROWTH IN MICROGRAVITY

ROBERT B. OWEN, BETH H. BROOM, ROBERT S. SNYDER, and RON DANIEL Apr. 1987 17 p (NASA-TP-2722; NAS 1.60:2722) Avail: NTIS HC A02/MF A01 CSCL 06B

CRYSTAL GROWTH, DROPS (LIQUIDS), MICROGRAVITY APPLICATIONS, PROTEIN SYNTHESIS, STABILITY

**52**

AEROSPACE MEDICINE

Includes biological, dynamic, and physical oceanography; and marine resources.

**N87-18976** National Aeronautics and Space Administration. Goddard Space Flight Center, Greenbelt, Md.


This publication is a cumulative index to the abstracts contained in the Supplements 261 through 292 of Aerospace Medicine and Biology: A Continuing Bibliography. It includes seven indexes - subject, personal author, corporate source, foreign technology, contract number, report number, and accession number.

Author
52 AEROSPACE MEDICINE

N87-30041* National Aeronautics and Space Administration, Washington, D.C.
AEROSPACE MEDICINE AND BIOLOGY: A CONTINUING BIBLIOGRAPHY WITH INDEXES (SUPPLEMENT 302)
Oct. 1987 55 p
(NASA-SP-7011(302); NAS 1.21:7011(302)) Avail: HC A04
CSCL 06E
This bibliography lists 131 reports, articles, and other documents introduced into the NASA scientific and technical information system in September, 1987. Author

61
COMPUTER PROGRAMMING AND SOFTWARE
Includes computer programs, routines, and algorithms, and specific applications, e.g., CAD/CAM.

N87-10720* National Aeronautics and Space Administration.
Goddard Space Flight Center, Greenbelt, Md.
PROCEEDINGS OF THE 5TH ANNUAL USERS' CONFERENCE
M. SZCZUR, ed. and E. HARRIS, ed. 1985 400 p Conference held at Greenbelt, Md., 4-6 Jun. 1985
(NASA-CP-2399; NAS 1.55:2399) Avail: NTIS HC A17/MF A01 CSCL 09B
ACCESS CONTROL, COMPUTER NETWORKS, FORMAT, IMAGE PROCESSING, ORBITAL SPACE STATIONS, SOFTWARE ENGINEERING, SOFTWARE TOOLS

N87-19931* National Aeronautics and Space Administration, Washington, D.C.
COMPUTER SCIENCES AND DATA SYSTEMS, VOLUME 1
(NASA-CP-2459-VOL-1; NAS 1.55:2459-VOL-1) Avail: NTIS HC A16/MF A01 CSCL 09B
ARCHITECTURE (COMPUTERS), CONCURRENT PROCESSING, CONFERENCES, DATA MANAGEMENT, DISTRIBUTED PROCESSING, EXPERT SYSTEMS, SOFTWARE ENGINEERING

N87-19932* National Aeronautics and Space Administration, Washington, D.C.
COMPUTER SCIENCES AND DATA SYSTEMS, VOLUME 2
(NASA-CP-2459-VOL-2; NAS 1.55:2459-VOL-2) Avail: NTIS HC A15/MF A01 CSCL 09B
CONFERENCES, DATA STORAGE, DISTRIBUTED PROCESSING, FIBER OPTICS, OPTICAL DATA PROCESSING, PARALLEL PROCESSING (COMPUTERS), VHSC (CIRCUITS)

N87-23156* National Aeronautics and Space Administration, Goddard Space Flight Center, Greenbelt, Md.
SIXTH ANNUAL USERS' CONFERENCE
MARTHA SZCZUR, ed. and ELFRIDA HARRIS, ed. (Science Applications Research, Lanham, Md.) Oct. 1986 228 p Conference held in Pasadena, Calif., 8-10 Oct. 1986; sponsored by JPL and NASA. Goddard Space Flight Center
(NASA-CP-2463; REPT-87B0176; NAS 1.55:2463) Avail: NTIS HC A11/MF A01 CSCL 09B
APPLICATIONS PROGRAMS (COMPUTERS), COMPUTER SYSTEMS PROGRAMS, CONFERENCES, IMAGE PROCESSING, INFORMATION SYSTEMS, MAN-COMPUTER INTERFACE, OPERATING SYSTEMS (COMPUTERS)

N87-26531* National Aeronautics and Space Administration.
Goddard Space Flight Center, Greenbelt, Md.
FRONTIERS OF MASSIVELY PARALLEL SCIENTIFIC COMPUTATION
(NASA-CP-2478; REPT-87B9876; NAS 1.55:2478) Avail: NTIS HC A13/MF A01 CSCL 09B
ALGORITHMS, COMPUTER GRAPHICS, COMPUTER SYSTEMS PERFORMANCE, COMPUTERIZED SIMULATION, PARALLEL COMPUTERS, PARALLEL PROCESSING (COMPUTERS)

62
COMPUTER SYSTEMS
Includes computer networks and special application computer systems.

N87-23202* National Aeronautics and Space Administration.
Lewis Research Center, Cleveland, Ohio.
APPLICATIONS AND REQUIREMENTS FOR REAL-TIME SIMULATORS IN GROUND-TEST FACILITIES
DALE J. ARPASI and RICHARD A. BLECH Dec. 1986 26 p
(NASA-TP-2672; E-3189; NAS 1.60:2672) Avail: NTIS HC A03/MF A01 CSCL 09B
GROUND TESTS, REAL TIME OPERATION, SIMULATORS, TEST FACILITIES

64
NUMERICAL ANALYSIS
Includes iteration, difference equations, and numerical approximation.

N87-14054* National Aeronautics and Space Administration.
Langley Research Center, Hampton, Va.
SOME PATH-FOLLOWING TECHNIQUES FOR SOLUTION OF NONLINEAR EQUATIONS AND COMPARISON WITH PARAMETRIC DIFFERENTIATION
(NASA-TP-2654; L-16199; NAS 1.60:2654) Avail: NTIS HC A02/MF A01 CSCL 12A
COMPUTER PROGRAMMING, CRITICAL PATH METHOD, DIFFERENTIAL EQUATIONS, NONLINEAR EQUATIONS, PARAMETER IDENTIFICATION

N87-14918* National Aeronautics and Space Administration.
Lewis Research Center, Cleveland, Ohio.
SOLUTION OF ELLIPTIC PARTIAL DIFFERENTIAL EQUATIONS BUT FAST POISSON SOLVERS USING A LOCAL RELAXATION FACTOR: TWO-STEP METHOD
S. C. CHANG May 1986 17 p
(NASA-TP-2530; E-2528-1; NAS 1.60:2530) Avail: NTIS HC A02/MF A01 CSCL 12A
ELLiptic DIFFERENTIAL EQUATIONS, ELLiptic FUNCTIONS, PARTIAL DIFFERENTIAL EQUATIONS, PROBLEM SOLVING
71 ACOUSTICS

Includes sound generation, transmission, and attenuation.

71 ACOUSTICS

Includes data sampling and smoothing; Monte Carlo method; and stochastic processes.

65 STATISTICS AND PROBABILITY
NUCLEAR AND HIGH-ENERGY PHYSICS

Includes elementary and nuclear particles; and reactor theory.

**Doubly Differential Cross Sections for Galactic Heavy-Ion Fragmentation**
Francis A. Cucinotta (Old Dominion Univ., Norfolk, Va.), John W. Norbury, Govind S. Khandelwal, and Lawrence W. Townsend
Feb. 1987 23 p
(NASA-TP-2659; L-16187; NAS 1.60:2659) Avail: NTIS HC A02/MF A01 CSCL 20H

**Collision Parameters, Galaxies, Heavy Ions, Particle Collisions, Scattering Cross Sections**

**Possible Complementary Cosmic-Ray Systems: Nuclei and Antinuclei**
Warren W. Buck, John W. Wilson, Lawrence W. Townsend, and John W. Norbury (Idaho Univ., Moscow.)
Jul. 1987 47 p
(NASA-TP-2741; L-16275; NAS 1.60:2741) Avail: NTIS HC A03/MF A01 CSCL 20H

**Antimatter, Antiparticles, Galactic Cosmic Rays, Heavy Ions, Nuclei (Nuclear Physics)**

**Optics**

Includes light phenomena; and optical devices.

**Theory for Computing the Field Scattered from a Smooth Inflected Surface**
R. L. Barger and A. K. Dominek
1986 23 p
(NASA-TP-2632; L-16157; NAS 1.60:2632) Avail: NTIS HC A01/ MF A01 CSCL 20F

**Bodies of Revolution, Electromagnetic Radiation, Microwaves, Reflectance, Surface Properties, Wave Scattering**

**Plasma Physics**

Includes magnetohydrodynamics and plasma fusion.

**Laser-Powered MHD Generators for Space Application**
N. W. Jalufka
Oct. 1986 15 p
(NASA-TP-2621; NAS 1.60:2621) Avail: NTIS HC A02/MF A01 CSCL 20I

**Energy Conversion Efficiency, Laser Plasma Interactions, Magnetohydrodynamic Generators**
89 ASTRONOMY

N87-27557* National Aeronautics and Space Administration, Washington, D.C.

NASA THESaurus Supplement (Supplement 3)
Jul. 1987 325 p
(NASA-SP-7053(SUPP-3); NAS 1.21:7053(SUPP-3)) Avail: NTIS HC A14 CSCL 05B


N87-30218* National Aeronautics and Space Administration, Washington, D.C.

NASA Scientific and Technical Publications A
N87-30218#

Listing, Part 2, Access Vocabulary, Part 3, NASA Thesaurus

1985 edition of the NASA Thesaurus includes Part 1, Hierarchical terms, personal authors, and NASA report numbers are provided. Author

85 URBAN TECHNOLOGY AND TRANSPORTATION

Includes applications of space technology to urban problems; technology transfer; technology assessment; and surface and mass transportation.

N87-70425* National Aeronautics and Space Administration, Washington, D.C.

SIGNIFICANT NASA INVENTIONS. AVAILABLE FOR LICENSING IN FOREIGN COUNTRIES
1977 103 p
(NASA-SP-7038(04); NAS 1.21:7038(04)) Avail: SOD HC $5.00 as 003-000-00986-1; NTIS MF A01

N87-22573* National Aeronautics and Space Administration. Goddard Space Flight Center, Greenbelt, Md.

INFRARED SOURCE CROSS-INDEX, FIRST EDITION
MARIAN SCHMIDTZ (Computer Sciences Corp., Beltsville, Md.), JAYLEE M. MEAD, and DANIEL Y. GEZARI Apr. 1987 323 p
(NASA-RP-1182; REPT-87B0058; NAS 1.61:1182) Avail: NTIS HC A14/MF A01 CSCL 03A

The Infrared Source Cross-Index is a listing of correlated infrared source names (and positions) for astronomical objects observed at 1-1000 microns. The source names have been obtained from the database of the first edition of the Catalog of Infrared Observations (CIO NASA RP 1182), covering observations published through 1982. Additional identifications were located by correlating these names with identifications contained in other machine-readable astronomical catalogs in the NASA National Space Science Data Center (NSSDC). There are some 80,000 different source names in the Cross-Index, corresponding to over 27,000 unique infrared sources. Author

400 ASTRONOMY

N87-24247* National Aeronautics and Space Administration.

ESSAYS IN SPACE SCIENCE
(NASA-CP-2464; REPT-87B0055; NAS 1.55:2464) Avail: NTIS HC A18/MF A01 CSCL 03B

ASTROPHYSICS, CONFERENCES, COSMIC RAYS, GAMMA RAY ASTRONOMY, INFRARED ASTRONOMY, X RAY ASTRONOMY

N87-28471* National Aeronautics and Space Administration.

CALCULATION AND ACCURACY OF ERBE SCANNER MEASUREMENT LOCATIONS
LAWRENCE H. HOFFMAN, WILLIAM L. WEAVER, and JAMES F. KIBLER Sep. 1987 34 p
(NASA-TP-2670; L-16216; NAS 1.60:2670) Avail: NTIS HC A03/MF A01 CSCL 03B

COMPUTATION, EARTH ATMOSPHERE, EARTH RADIATION BUDGET EXPERIMENT, POSITION (LOCATION), REMOTE SENSING, SCANNING

89 ASTRONOMY

Includes radio, gamma-ray, and infrared astronomy; and astrometry.

N87-14219* National Aeronautics and Space Administration. Goddard Space Flight Center, Greenbelt, Md.

TEN YEAR PLANETARY EPHEMERIS: 1986-1995
F. ESPENAK Nov. 1986 249 p
(NASA-RP-1176; NAS 1.61:1176; REPT-86B0471) Avail: NTIS HC A11/MF A01 CSCL 03A

Accurate geocentric positions are tabulated at five day intervals for the Sun, Mercury, Venus, Mars, Jupiter, Saturn, Uranus and Neptune during the ten year period 1986 through 1995. The apparent angular diameters, radial velocities, declinations and mean times of meridian transit of the seven planets and the Sun are graphically depicted for each year in the interval. Appendices are included which discuss the theory of planetary orbits and a FORTRAN program for calculating planetary ephemeredes. Author
LUNAR AND PLANETARY EXPLORATION

Includes planetology; and manned and unmanned flights.

SOLAR PHYSICS

Includes solar activity, solar flares, solar radiation and sunspots.

ASTROPHYSICS

Includes cosmology; celestial mechanics; space plasmas; and interstellar and interplanetary gases and dust.
ATMOSPHERE, SOLAR CORONA, SOLAR MAGNETIC FIELD, SOLAR PHYSICS, SOLAR PROMINENCES, SUN


STATISTICAL ASPECTS OF SOLAR FLARES
ROBERT M. WILSON Apr. 1987 41 p (NASA-TP-2714; NAS 1.60-2714) Avail: NTIS HC A03/MF A01 CSCL 03B

SOLAR FLARES, SOLAR PROMINENCES, STATISTICAL ANALYSIS

N87-21785*# National Aeronautics and Space Administration. Goddard Space Flight Center, Greenbelt, Md.

RAPID FLUCTUATIONS IN SOLAR FLARES

CONFERENCES, MICROWAVES, OSCILLATIONS, PLASMA PHYSICS, RADIO WAVES, SOLAR FLARES, X RAYS

93

SPACE RADIATION

Includes cosmic radiation; and inner and outer earth’s radiation belts.

N87-25984*# National Aeronautics and Space Administration. Goddard Space Flight Center, Greenbelt, Md.

COSMIC RAY HEAVY ION LET MAPPING FOR ALUMINUM, SILICON, AND TISSUE TARGETS

Linear energy transfer (LET) values in aluminum, silicon, and tissue targets have been calculated for 31 galactic cosmic ray ion species in eight different units. The values are described for single event upset (SEU) effect assessments or radiobiological evaluations. The data are presented in graphical and tabular form.

Author

99

GENERAL

N87-24390*# National Aeronautics and Space Administration. Langley Research Center, Hampton, Va.

ENGINEER IN CHARGE: A HISTORY OF THE LANGLEY AERONAUTICAL LABORATORY, 1917-1958

(Available: SOD HC $30.00 as 039-000-00999-2; NTIS MF A01 CSCL 05B)

A history is presented by using the most technologically significant research programs associated with the Langley Aeronautical Laboratory from 1917 to 1958 and those programs that, after preliminary research, seemed best to illustrate how the laboratory was organized, how it works, and how it cooperated with industry and the military.

B.G.
ATMOSPHERIC ELECTRICITY
NASA/MSFC FY-85 Atmospheric Processes Research Review
[NASA-CP-2402] p 20 N87-13043

ATMOSPHERIC TURBULENCE
Atmospheric Turbulence Relative to Aviation, Missile, and Space Programs
[NASA-CP-2468] p 21 N87-22341

ATOMIC BEAMS
Electron stimulated desorption of atomic oxygen from silver
[NASA-TP-2566] p 12 N87-18629

AUTOMATIC CONTROL
An evaluation of a pilot interface with an automatic terminal approach system
[NASA-TP-2669] p 7 N87-19393

AUTOMATIC SIGHTING
Photometric simulation study of the effects of an automated trim system on flight characteristics of a light twin-engine airliner named Boeing 717
[NASA-TP-2633] p 2 N87-10843

AUTOMATIC PILOTS
A simulation evaluation of a pilot interface with an automatic terminal approach system
[NASA-TP-2569] p 7 N87-19393

AYONICS
Joint University Program for Air Transportation Research, 1983
[NASA-CP-2451] p 1 N87-18520

AYONICS
Joint University Program for Air Transportation Research, 1984
[NASA-CP-2452] p 1 N87-22964

AXISymmetric BODIES
A simulation evaluation of a pilot interface with an automatic terminal approach system
[NASA-TP-2569] p 7 N87-19393

AXISymmetric bodies
Static internal performance of single-expansion-ram nozzles with thrust-recting capability up to 60 deg
[NASA-TP-2364] p 2 N87-10839

Effects of empennage surface location on aerodynamic characteristics of a twin-engine afterbody model with nonsymmetric nozzles
[NASA-TP-2392] p 6 N87-17895

Rayleigh-Ritz analysis of a symmetric nozzle for coupled-cavity traveling-wave tubes
[NASA-TP-2675] p 14 N87-22923

Effects of trade between boattail angle and wedge angle on the performance of a nonsymmetric wedge nozzle
[NASA-TP-2717] p 4 N87-23593

AXISYMMETRIC FLOW
Effects of afterbody boattail design and empennage arrangement on aeropropulsive characteristics of a twin-engine afterbody model at transonic speeds
[NASA-TP-2704] p 3 N87-21873

AERONAUTICAL ENGINEERING
A continuing bibliography with indexes (supplement 277)
[NASA-SP-7073(217)] p 1 N87-27613

Technology for Large Space Systems. A bibliography with indexes (supplement 17)
[NASA-SP-7046(17)] p 9 N87-29576

Aerospace medicine and biology: A continuing bibliography with indexes (supplement 302)
[NASA-SP-7017(302)] p 22 N87-30041

AEROSPACE MEDICINE AND BIOLOGY
Surface bidirectional reflectance properties of two southwestern Arizona desert for wavelengths between 0.4 and 2.5 micrometers
[NASA-TP-2643] p 18 N87-22281

BIODIRECTIONAL REFLECTANCE
Effects of aerosols and surface shadowing on bidirectional reflectance measurements of deserts
[NASA-TP-2756] p 19 N87-28162

BIOLOGICAL EFFECTS
Aerospace medicine and biology: A cumulative index to the 1986 issues (supplement 293)
[NASA-SP-7017(293)] p 21 N87-19576

Aerospace medicine and biology: A continuing bibliography with indexes (supplement 302)
[NASA-SP-7017(302)] p 22 N87-30041

BIT ERROR RATE
Bit-error-rate testing of high-power 30-GHz traveling wave tubes for ground-terminal applications
[NASA-TP-2635] p 13 N87-17971

Unique bit-error-rate measurement system for satellite communication systems
[NASA-TP-2699] p 13 N87-20448

BLADE SLAP NOISE
Correlation of helicopter impulsive noise from blade-vortex interaction with rotor mean inflow
[NASA-TP-2550] p 23 N87-18399

BLADED TIPS
Low-cost FM oscillators for capacitorace tip type of blade tip clearance measurement system
[NASA-TP-2746] p 7 N87-24481

BLADE-VORTEX INTERACTION
Correlation of helicopter impulsive noise from blade-vortex interaction with rotor mean inflow
[NASA-TP-2650] p 23 N87-18399

Helicopter blade-vortex interaction locations: Scale-model acoustic and free-wake analysis results
[NASA-TP-2658] p 3 N87-18537

BLADES
Preliminary structural design of composite main rotor blades for minimum weight
[NASA-TP-2730] p 11 N87-25435

BLUNT BODIES
Drag measurements of blunt storements tangentially mounted on a flat plate at supersonic speeds
[NASA-TP-2742] p 5 N87-27626

BOATTAILS
Effects of afterbody boattail design and empennage arrangement on aeropropulsive characteristics of a twin-engine afterbody model at transonic speeds
[NASA-TP-2704] p 3 N87-21873

BOLTZMANN TRANSPORT EQUATION
A second-order accurate kinetic-theory-based method for inviscid compressible flows
[NASA-TP-2613] p 15 N87-18763

BONDING
Effects of LID (Registered) processing on the property of a real gas
[NASA-TP-2677] p 12 N87-19351

BOUNDRY LAYER FLOW
In-flight surface-of-flight photographs with comparisons to pressure distribution and boundary-layer data
[NASA-TP-2395] p 3 N87-20966

BOUNDARY LAYER STABILITY
Numerical simulation of channel flow transition, resolution requirements and structure of the hairpin vortex
[NASA-TP-2667] p 12 N87-18644

BOUNDRY LAYER TRANSITION
Numerical simulation of channel flow transition, resolution requirements and structure of the hairpin vortex
[NASA-TP-2667] p 3 N87-19351

BOUNDARY LAYERS
Aerothermal evaluation of a spherically blunted body with a trapezoidal cross section in the Langley 8-foot high-temperature tunnel
[NASA-TP-2641] p 15 N87-18782

BOUNDARY VALUE PROBLEMS
Numerical simulation of channel flow transition, resolution requirements and structure of the hairpin vortex
[NASA-TP-2667] p 3 N87-19351

BRAKING
Wind-tunnel investigation at supersonic speeds of a remote-controlled canard missile with a moving-camber tail brake torque system
[NASA-TP-2341] p 3 N87-17668

CALIBRATING
Calibration of the spin-scan ozone imager aboard the dynamics Explorer 1 satellite
[NASA-TP-2720] p 21 N87-26491

CANARD CONFIGURATIONS
Wind-tunnel investigation of the flight characteristics of a canard generalized configuration airplane
[NASA-TP-2623] p 1 N87-10042

CANARD CONFIGURATIONS
Wind-tunnel investigation at supersonic speeds of a remotely-controlled canard missile with a free-rolling tail brake torque system
[NASA-TP-2401] p 3 N87-17668

CARNON
Traveling-wave-tube efficiency improvement by a low-cost technique for deposition of carbon on multistage traveling-wave tubes
[NASA-TP-2719] p 14 N87-21239

CARBON DIOXIDE
System study of the carbon dioxide observation platform system (CO-OPS) Project overview
[NASA-TP-2699] p 9 N87-18568

CARBON DIOXIDE LASERS
Closed-Cycle, Frequency-Stable CO2 Laser
[NASA-CP-2456] p 16 N87-20522

CARBON FIBERS
Effects of thermal cycling on graphite-fiber-reinforced 6091 aluminum
[NASA-SP-7952] p 11 N87-10184

CARBON TETRAFLUORIDE
Description and calibration of the Langley Hypersonic CF4 tunnel: A facility for simulating low gamma flow as occurs for a real gas
[NASA-TP-2384] p 16 N87-29778

CATALOGS (PUBLICATIONS)
[NASA-SP-7063] p 25 N87-30218

CAVITIES
Space shuttle main engine high pressure fuel pump aft platform seal cavity flow analysis
[NASA-TP-2655] p 14 N87-17000

CINEMATOGRAPHY
Experimental cavity pressure distributions at supersonic speeds
[NASA-TP-2693] p 3 N87-22626

Revised NASA axially symmetric ring model for coupled-cavity traveling-wave tubes
[NASA-TP-2675] p 14 N87-22923

CELESTIAL MECHANICS
Fifty year canon of solar eclipses: 1986 - 2035

CESTRAL ANALYSIS
Power cepstrum technique with application to model helicopter acoustic data
[NASA-TP-2568] p 23 N87-17479

CHANNEL FLOW
Numerical simulation of channel flow transition, resolution requirements and structure of the hairpin vortex
[NASA-TP-2667] p 3 N87-19351

CHEMILUMINESCENCE
Ester oxidation on an aluminum surface using chemiluminescence
[NASA-TP-2511] p 12 N87-18666

CINEMA TOGRAPHY
Evaluation of diffuse-illumination holographic cinematography in a flutter cascade
[NASA-TP-2593] p 16 N87-13731
FLAPs (CONTROL SURFACES)
Applicability of linearized theory attached-flow methods to design and analysis of flap systems at low speeds for thin wing sections with sharp leading edges
[NASA-TP-2659] p 2 N87-15174

FLAT PLATES
Drag measurements of blunt stores tangentially mounted on a flat plate at supersonic speeds
[NASA-TP-2742] p 5 N87-27026

FLEXIBLE STRUCTURES
Structural Dynamics and Control Interaction of Flexible Structures
[NASA-CR-2467-Pt-1] p 10 N87-22702
Structural Dynamics and Control Interaction of Flexible Structures
[NASA-CR-2467-Pt-2] p 10 N87-22729

FLEXIBLE SPACECRAFT
NASA/DOD Control/Structures Interaction Technology, 1986

FLIGHT CHARACTERISTICS
Wind-tunnel investigation of the flight characteristics of a canard general-aviation airplane configuration
[NASA-TP-2623] p 1 N87-10039
Piloted simulator study of allowable time delays in large-vehicle airplane
[NASA-TP-2652] p 8 N87-18649
Flight characteristics of the AD-1 oblique-wing research aircraft
[NASA-TP-2223] p 5 N87-18570

FLIGHT CONTROL
Joint University Program for Air Transportation Research, 1983
[NASA-CP-2455] p 1 N87-18520
Joint University Program for Air Transportation Research, 1985
[NASA-CP-2455] p 1 N87-25796

FLIGHT CREWS
Cockpit Resource Management Training
[NASA-CR-2455] p 5 N87-22234

FLIGHT MANAGEMENT SYSTEMS
Ground-based time guidance algorithm for control of airplanes in a time-metered air traffic control environment: A piloted simulation study
[NASA-TP-2616] p 7 N87-10864

FLIGHT SAFETY
Wind Shear/Turbulence Inputs to Flight Simulation and Systems Certification
[NASA-TP-2616] p 1 N87-25287

FLIGHT SIMULATION
Ground-based time guidance algorithm for control of airplanes in a time-metered air traffic control environment: A piloted simulation study
[NASA-TP-2616] p 7 N87-10864
Cockpit Resource Management Training
[NASA-CR-2455] p 5 N87-22234
Wind Shear/Turbulence Inputs to Flight Simulation and Systems Certification
[NASA-CR-2474] p 1 N87-25267
Piloted simulation study of effects of vortex flows on low-speed handling qualities of a Delta-wing airplane
[NASA-TP-2747] p 6 N87-26622

FLIGHT SIMULATORS
Aerodynamical facilities at NASA Langley Research Center
[NASA-RP-1146] p 6 N87-10976
Piloted simulator study of allowable time delays in large-airplane response
[NASA-CP-2655] p 8 N87-16849

FLIGHT TESTS
In-flight total forces, moments and static aeroelastic characteristics of an oblique-wing research airplane
[NASA-TP-2224] p 8 N87-10103
Development and evaluation of an airplane electronic display format signed with the inertial velocity vector
[NASA-TP-2648] p 7 N87-13498
New methods and means for quantification of lightning aircraft electrodynamics
[NASA-TP-2737] p 3 N87-21871
Flight investigation of an effect of the outboard wing-leading-edge modification on stall characteristics of a low-wing, single-engine, T-tail light airplane
[NASA-TP-2691] p 5 N87-22814
Application of parameter estimation to aircraft stability and control: the output-error approach
[NASA-RP-1166] p 6 N87-20949
Analog signal conditioning for flight test instrumentation
[NASA-RP-1159] p 7 N87-29533

FLIGHT TRAINING
Cockpit Resource Management Training
[NASA-CR-2455] p 5 N87-22234

FLOW DISTRIBUTION
Design of 8-21 pressure-ratio 5-stage core compressor and overall performance for first 3 stages
[NASA-TP-2725] p 3 N87-17698
Aerothermal evaluation of a spherically blunted body with a trapezoidal cross section in the Langley 8-foot high-temperature tunnel
[NASA-TP-2841] p 15 N87-18762
Detailed flow surveys of turning vanes designed for a 0.1-scale model of NASA Lewis Research Center's proposed altitude wind tunnel
[NASA-TP-2690] p 9 N87-20295
Study of lee-side flows over concaved bottom delta wings at supersonic speeds, part 1
[NASA-TP-2660-PT-1] p 4 N87-23597
Study of lee-side of flows over concaved bottom delta wings at supersonic speeds, part 2
[NASA-TP-2660-PT-2] p 4 N87-25301
Qualitative evaluation of a flush air data system at transonic speeds and high angles of attack
[NASA-TP-2716] p 6 N87-29497

FLOW VELOCITY
Experimental evaluation of wall Mach number distributions of the octagonal test section proposed for NASA Lewis Research Center's altitude wind tunnel
[NASA-TP-2700] p 8 N87-17117
Jet model for slot film cooling with effect of free-stream and coolant turbulence
[NASA-TP-2655] p 15 N87-19034
Measurements of flow rate and trajectory of aircraft tire-generated water spray
[NASA-TP-2645] p 5 N87-24458

FLOW VISUALIZATION
Evaluation of diffuse-illumination holography: cinematography in a flutter cascade
[NASA-TP-2593] p 16 N87-13731
In-flight surface oil-photographs with comparisons to pressure distribution and boundary-layer data
[NASA-TP-2995] p 3 N87-20966
Study of lee-sides flows over concaved bottom Delta wings at supersonic speeds, part 2
[NASA-TP-2660-PT-2] p 4 N87-22085

FLUID DYNAMICS
NASA-Chinese Aeronautical Establishment (CAE) Symposia
[NASA-CP-2433] p 7 N87-22067

FLUID FLOW
Experimental cavity pressure distributions at supersonic speeds
[NASA-TP-2653] p 3 N87-22526

FLUID MANAGEMENT
Microgravity Fluid Management Symposium
[NASA-CP-2465] p 13 N87-21141

FLUTTER
Effects of winglet on transonic flutter characteristics of a cantilevered twin-engine-transport wing model
[NASA-TP-2657] p 17 N87-13789

FOG DISPERSAL
Development testing of large volume water sprays for windshild-fog dispersal
[NASA-TP-2607] p 10 N87-12585

FORMAT
Proceedings of the 5th Annual Users' Conference
[NASA-CP-2389] p 22 N87-10720

FRACTURE MECHANICS
Structural Integrity and Durable of Reusable Space Propulsion Systems
[NASA-CR-2471] p 11 N87-22766

FREE FIGHT
Wind-tunnel free-flight investigation of a 0.15-scale model of the F-106B airplane with vortex flaps
[NASA-TP-2700] p 3 N87-21855

FREE FLOW
Helicopter blade-vortex interaction locations: Scale-model acoustics and free-stream analysis results
[NASA-TP-2735] p 3 N87-18537

FREQUENCIES
Frequency domain laser velocimeter signal processor: A new signal processing scheme
[NASA-TP-2753] p 16 N87-27994

FREQUENCY MODULATION
Low-cost, miniaturized oscillators for capacitance type of blade tip clearance measurement system
[NASA-TP-2746] p 7 N87-24481

FUEL CONSUMPTION
Ground-based time guidance algorithm for control of airplanes in a time-metered air traffic control environment: A piloted simulation study
[NASA-TP-2616] p 7 N87-10864
### SUBJECT INDEX

#### MOLECULES
- Microscopy crystallization of macromolecules: An interim report and proposal for continued research [NASA-TP-2871] p 13 N87-20423

#### MOON
- Status and future of lunar geoscience [NASA-SP-484] p 26 N87-19322

#### MOUNTING
- Drag measurements of blunt stores tangentially mounted on a flat plate at supersonic speeds [NASA-TP-2742] p 5 N87-27626

#### NASA PROGRAMS
- Management: A bibliography for NASA managers (supplement 21) [NASA-TP-2717] p 24 N87-28033
- NASA patent abstracts bibliography: A continuing bibliography. Section 1: Abstracts (supplement 31) [NASA-SP-7039(31)] p 24 N87-25023
- NASA/SP-7039(SUPP-3) p 25 N87-27557

#### NASTRAN

#### NATURAL GAS

#### NAVIER-STOKES EQUATION
- Multiscale turbulence effects in supersonic jets exhausting into still air [NASA-TP-2620] p 15 N87-24672
- Supercomputing in Aerospace [NASA-CP-2454] p 4 N87-25986

#### NEPTUNE ATMOSPHERE
- The Jovian Atmospheres [NASA-TP-2720] p 26 N87-17508

#### NICKEL CADMIUM BATTERIES

#### NICKEL HYDROGEN BATTERIES

#### NIMBUS SATELLITE

#### NIMBUS 7 SATELLITE
- Description of data on the Nimbus 7 LMS map archive tape: Ozone and nitric acid [NASA-TP-2625] p 19 N87-13022

#### NITRIC ACID
- Description of data on the Nimbus 7 LMS map archive tape: Ozone and nitric acid [NASA-TP-2625] p 19 N87-13022

#### NOISE INTENSITY
- Effects of background noise on total noise annoyance [NASA-TP-2620] p 23 N87-14120

#### NOISE POLLUTION
- Effects of background noise on total noise annoyance [NASA-TP-2620] p 23 N87-14120

#### NOISE TOLERANCE
- Effects of background noise on total noise annoyance [NASA-TP-2620] p 23 N87-14120

#### NONDESTRUCTIVE TESTS
- Low-cost FM oscillator for capacitance type of blade tip clearance measurement system [NASA-TP-2746] p 7 N87-24481
- Electromagnetic and mechanical vibration technology [NASA-CP-2472] p 17 N87-27204

#### NONLINEAR EQUATIONS
- Some path-following techniques for solution of nonlinear equations and comparison with parametric differentiation [NASA-TP-2654] p 22 N87-14054

#### NOZZLE FLOW
- Static internal performance of single-expansion-ramp nozzle with thrust-vectoring capability up to 60 deg [NASA-TP-2646] p 2 N87-10839
- Experimental evaluation of heat transfer on a 100K/cm area ratio rocket nozzle [NASA-TP-2721] p 11 N87-25424

#### NOZZLE GEOMETRY
- Effect of port corner geometry on the internal performance of rotating-vane-type thrust reverser [NASA-TP-2624] p 2 N87-12541

### PERFORMANCE TESTS

#### OSCILLATIONS
- Calculation of viscous effects on transonic flow for oscillating airfoils and partial differential equations [NASA-TP-2731] p 5 N87-27622

#### OSCILLATORS
- Low-cost FM oscillator for capacitance type of blade tip clearance measurement system [NASA-TP-2746] p 7 N87-24481

#### OSCILATION

#### OXYGEN
- Electron stimulated desorption of atomic oxygen from silver [NASA-TP-2668] p 12 N87-18629
- Permeation of oxygen through high purity, large grain silver [NASA-TP-2755] p 12 N87-27024

#### OXYGEN SUPPLY EQUIPMENT
- Calibration of the spin-scan ozone imager aboard the dynamics Explorer 1 satellite [NASA-TP-2723] p 21 N87-26491

#### PANEL METHOD (FLUID DYNAMICS)
- Steady and unsteady aerodynamic forces from the SCHUR-SUrnfs panel method for a fighter velocity with tip missile and comparison with experiment and PANARI [NASA-TP-2738] p 4 N87-26032

#### PARALLEL COMPUTERS

#### PARALLEL PROCESSING (COMPUTERS)

#### PARAMETER IDENTIFICATION
- Some path-following techniques for solution of nonlinear equations and comparison with parametric differentiation [NASA-TP-2654] p 22 N87-14054
- Application of parameter estimation to aircraft stability and control: The output-error approach [NASA-TP-2686] p 6 N87-29499

#### PARTIAL DIFFERENTIAL EQUATIONS
- Solution of elliptic partial differential equations by fast Poisson solvers using a local relaxation factor: 2-Step method [NASA-TP-2500] p 22 N87-14918

#### PARTICLE COLLISIONS
- Doubly differential cross sections for gatikic heavy-ion fragmentation [NASA-TP-2659] p 24 N87-17487

#### PARTICLE SIZE DISTRIBUTION
- Automated Reduction of Data from Images and Holograms [NASA-CP-2477] p 5 N87-29432

#### PARTICLE TRAJECTORIES
- Calculation of secondary electron trajectories in multistage depressed collectors for microwave amplifiers [NASA-TP-2664] p 14 N87-17991

#### PATENT POLICY
- NASA patent abstracts bibliography: A continuing bibliography, Section 1: Abstracts (supplement 31) [NASA-SP-7039(31)] p 24 N87-25023
- NASA patent abstracts bibliography: A continuing bibliography, Section 2: Indexes (supplement 31) [NASA-SP-7039(31)-SECT-2] p 24 N87-26689

#### PATHFINDER

### PERFORMANCE TESTS
- Development and evaluation of an airplane electronic display system, format aligned with the interim velocity vector [NASA-TP-2648] p 7 N87-13438
- Design of 8.271-pressure ratio 5-stage core compressor and overall performance for first 3 stages [NASA-TP-2597] p 7 N87-17899
- Flettner effect testing of high-power 30-GHz traveling wave tubes for ground terminal applications [NASA-TP-2635] p 13 N87-17971
KLEINER, ALAN L.

KIPLINGER, ALAN L.

KNIPE, ALAN D.

KOSMAHL, HENRY D.

LANE, DONALD L.

LEAVY, L. D.

LEAVITT, L. D.

LEAVITT, L. D.

LEAVITT, L. D.

LEROY, L. D.

LEROY, L. D.

LEROY, L. D.

LEROY, L. D.

LEROY, L. D.

LEROY, L. D.

LEVINE, JOEL S.

LEVINE, JOEL S.

LEWICK, DAVID G.

LEWICKI, DAVID G.

LONG, EDWARD R., JR.

LONG, EDWARD R., JR.

LONG, EDWARD R., JR.

LYONS, VALERIE J.

LYONS, VALERIE J.

MANN, MICHAEL J.

MANUEL, GREGORY S.

MARTIN, R. M.

MARTIN, R. M.

MARTIN, R. M.

MCCLELAN, V.

MCCLELAN, V.

MCCLELAN, V.

MCCLELAN, V.

MCCLELAN, V.

MCCLELAN, V.

MEADER, MICHAEL A.

MEAD, JAY LEE M.

MEAD, JAY LEE M.

MEAD, JAY LEE M.

MEAD, JAY LEE M.

MEAD, JAY LEE M.

MEAN, IRWIN M.

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NASA-TP-2736
NASA-TP-2737 ..................................... p 3
NASA-TP-2738 ..................................... p 17
NASA-TP-2739 ..................................... p 6
NASA-TP-2740 ..................................... p 8
NASA-TP-2741 ..................................... p 24
NASA-TP-2742 ..................................... p 5
NASA-TP-2743 ..................................... p 13
NASA-TP-2744 ..................................... p 12
NASA-TP-2745 ..................................... p 13
NASA-TP-2746 ..................................... p 7
NASA-TP-2747 ..................................... p 8
NASA-TP-2749 ..................................... p 9
NASA-TP-2751 ..................................... p 11
NASA-TP-2752 ..................................... p 14
NASA-TP-2755 ..................................... p 12
NASA-TP-2756 ..................................... p 19
NASA-TP-2757 ..................................... p 13
NASA-TP-2758 ..................................... p 15
NASA-TP-2759 ..................................... p 23
NASA-TP-2763 ..................................... p 5

REPORT NUMBER INDEX

N87-26032
N87-21671
N87-26025
N87-26041
N87-25331
N87-24977
N87-27626
N87-24590
N87-25463
N87-24585
N87-24481
N87-24922
N87-26570
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NASA-Langley, 1988