A CATALOG OF SPECIAL PUBLICATIONS, REFERENCE PUBLICATIONS, CONFERENCE PUBLICATIONS, AND TECHNICAL PAPERS 1987–1990
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, archaeologists, 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.


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), focuses on scientific and technical reports, and IAA (International Aerospace Abstracts), 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 page vi).

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.

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A Continuing Bibliography
Section 1: Abstracts; Section 2: Indexes

Monthly plus
annual cumulative index

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Semiannual
Because of the great environmental significance of ozone and to support continuing research at the Antarctic and other Southern Hemisphere stations, the development of the 1989 ozone hole was monitored using data from the Nimbus-7 Total Ozone Mapping Spectrometer (TOMS) instrument, produced in near-real-time. This Atlas provides a complete set of daily polar orthographic projections of the TOMS total ozone measurements over the Southern Hemisphere for the period August 1 through November 30, 1989. The 1989 ozone hole developed in a manner similar to that of 1987, reaching a comparable depth in early October. This was in sharp contrast to the much weaker hole of 1988. The 1989 ozone hole remained at polar latitudes as it filled in November, in contrast to other recent years when the hole drifted to mid-latitudes before disappearing. Daily ozone values above selected Southern Hemisphere stations are presented, along with comparisons of the 1989 ozone distribution to that of other years.

Author
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Includes aerodynamics of bodies, combinations, wings, rotors, and control surfaces; and internal flow in ducts and turbomachinery. For related information see also 34 Fluid Mechanics and Heat Transfer. |
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## ASTRONAUTICS
For related information see also Aeronautics.

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For extraterrestrial exploration see 91 Lunar and Planetary Exploration. |
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| GROUND SUPPORT SYSTEMS AND FACILITIES (SPACE) | 23 |
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| LAUNCH VEHICLES AND SPACE VEHICLES | 23 |
Includes boosters; operating problems of launch/space vehicle systems; and reusable vehicles. For related information see also 20 Spacecraft Propulsion and Power. |
| SPACE TRANSPORTATION | 24 |
Includes passenger and cargo space transportation, e.g., shuttle operations; and space rescue techniques. For related information see also 03 Air Transportation and Safety and 18 Spacecraft Design, Testing and Performance. For space suits see 54 Man/System Technology and Life Support. |
| SPACE COMMUNICATIONS, SPACECRAFT COMMUNICATIONS, COMMAND AND TRACKING | N.A. |
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18 SPACECRAFT DESIGN, TESTING AND PERFORMANCE ............................................ 24
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25 INORGANIC AND PHYSICAL CHEMISTRY ....................................................... 29
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26 METALLIC MATERIALS ..................................................................................... 30
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27 NONMETALLIC MATERIALS ............................................................................. 31
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, 20 Spacecraft Propulsion and Power, and
44 Energy Production and Conversion.

29 MATERIALS PROCESSING ............................................................................. 32
Includes space-based development of products and processes for commercial application. For biological
materials see 55 Space Biology.

ENGINEERING For related information see also Physics.

31 ENGINEERING (GENERAL) ............................................................................. 32
Includes vacuum technology; control engineering; display engineering; cryogenics; and fire prevention.

32 COMMUNICATIONS AND RADAR .................................................................. 33
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33 ELECTRONICS AND ELECTRICAL ENGINEERING ...................................... 34
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zation; and integrated circuitry. For related information see also 60 Computer Operations and Hardware and
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34 FLUID MECHANICS AND HEAT TRANSFER ................................................... 35
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35 INSTRUMENTATION AND PHOTOGRAPHY ............................................... 39
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and holography. For aerial photography see 43 Earth Resources and Remote Sensing. For related information
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36 LASERS AND MASERS .................................................................................... 40
Includes parametric amplifiers. For related information see also 76 Solid-State Physics.
37 MECHANICAL ENGINEERING
Includes auxiliary systems (nonpower); machine elements and processes; and mechanical equipment.

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. For applications see 05 Aircraft Design, Testing and Performance and 18 Spacecraft Design, Testing and Performance.

GEOSCIENCES For related information see also Space Sciences.

42 GEOSCIENCES (GENERAL)

43 EARTH RESOURCES AND REMOTE SENSING
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
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
Includes atmospheric, noise, thermal, and water pollution.

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

47 METEOROLOGY AND CLIMATOLOGY
Includes weather forecasting and modification.

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

LIFE SCIENCES

51 LIFE SCIENCES (GENERAL)

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

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

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

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

MATHEMATICAL AND COMPUTER SCIENCES

59 MATHEMATICAL AND COMPUTER SCIENCES (GENERAL)

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

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

62 COMPUTER SYSTEMS
Includes computer networks and special application computer systems.
63 CYBERNETICS
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
Includes iteration, difference equations, and numerical approximation.

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

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

67 THEORETICAL MATHEMATICS
Includes topology and number theory.

PHYSICS For related information see also Engineering.

70 PHYSICS (GENERAL)
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
Includes atomic structure, electron properties, and molecular spectra.

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

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

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

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

77 THERMODYNAMICS AND STATISTICAL PHYSICS
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

80 SOCIAL SCIENCES (GENERAL)
Includes educational matters.

81 ADMINISTRATION AND MANAGEMENT
Includes management planning and research.

82 DOCUMENTATION AND INFORMATION SCIENCE
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
Includes cost effectiveness studies.

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

85 URBAN TECHNOLOGY AND TRANSPORTATION
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
For related information see also Geosciences.

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<td>Includes radio, gamma-ray, and infrared astronomy; and astrometry.</td>
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<td>Includes cosmology; celestial mechanics; space plasmas; and interstellar and interplanetary gases and dust. For related information see also 75 Plasma Physics.</td>
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<td>LUNAR AND PLANETARY EXPLORATION</td>
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<td>Includes planetology; and manned and unmanned flights. For spacecraft design or space stations see 18 Spacecraft Design, Testing and Performance.</td>
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<td>Includes solar activity, solar flares, solar radiation and sunspots. For related information see 93 Space Radiation.</td>
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<td>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.</td>
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### GENERAL
Includes aeronautical, astronautical, and space science related histories, biographies, and pertinent reports too broad for categorization; histories or broad overviews of NASA programs.

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This bibliography lists 450 reports, articles, and other documents introduced into the NASA scientific and technical information system in August, 1987.

Author
01 AERONAUTICS (GENERAL)

N89-19407*# National Aeronautics and Space Administration, Ames Research Center, Moffett Field, CA.

GENERAL EQUILIBRIUM CHARACTERISTICS OF A DUAL-LIFT HELICOPTER SYSTEM
L. S. CICOLANI and G. KANNING Jul. 1986 86 p (NASA-TP-2615; A-86114; NAS 1.60:2615) Avail: NTIS HC A05/MF A01 CSCL 01B
- CARGO AIRCRAFT, EQUILIBRIUM, HEAVY LIFT HELICOPTERS, SUSPENDING (HANGING), TETHERING

N88-23715*# National Aeronautics and Space Administration. Langley Research Center, Hampton, VA.

JOINT UNIVERSITY PROGRAM FOR AIR TRANSPORTATION RESEARCH, 1986
- AERODYNAMICS, AIRCRAFT CONTROL, AIRCRAFT GUIDANCE, AVIONICS, SURFACE NAVIGATION

N88-27148*# National Aeronautics and Space Administration, Ames Research Center, Moffett Field, CA.

INTEGRATED TECHNOLOGY ROTOR METHODOLOGY ASSESSMENT WORKSHOP
- AERODYNAMIC STABILITY, AEROELASTICITY, CONFERENCES, MATHEMATICAL MODELS, ROTOR AERODYNAMICS, ROTOR BODY INTERACTIONS

N88-27163* National Aeronautics and Space Administration, Washington, DC.

- This bibliography lists 455 reports, articles, and other documents introduced into the NASA scientific and technical information system in July, 1988. Author

N88-9-27104* National Aeronautics and Space Administration, Washington, DC.

- This bibliography lists 466 reports, articles, and other documents introduced into the NASA scientific and technical information system in July, 1989. Subject coverage includes: design, construction and testing of aircraft and aircraft engines; aircraft components, equipment and systems; ground support systems; and theoretical and applied aspects of aerodynamics and general fluid dynamics.

N90-20921*# National Aeronautics and Space Administration. Langley Research Center, Hampton, VA.

JOINT UNIVERSITY PROGRAM FOR AIR TRANSPORTATION RESEARCH, 1988-1989
- AIR NAVIGATION, AIR TRAFFIC CONTROL, AIR TRANSPORTATION, AIRCRAFT CONTROL, AVIONICS, CONFERENCES, CONTROL SYSTEMS DESIGN, CONTROL THEORY, PSYCHOLOGY, UNIVERSITIES, WARNING SYSTEMS, WIND SHEAR

N90-20942*# National Aeronautics and Space Administration. Lewis Research Center, Cleveland, OH.

LASER VELOCIMETER-MEASURED FLOW FIELD AROUND AN ADVANCED, SWEPT, EIGHT-BLADE PROPELLER AT MACH 0.8
HARVEY E. NEUMAN, JOHN A. SERAFINI, DANIEL Y. WHIPPLE, and BRIAN T. HOWARD May 1985 100 p (NASA-TP-2462; E-2429; NAS 1.60:2462) Avail: Issuing Activity CSCL 01B
- FLOW DISTRIBUTION, LASER DOPPLER VELOCIMETERS, PROPPELLERS, WIND TUNNEL TESTS

N90-27548* National Aeronautics and Space Administration, Washington, DC.

- NTIS standing order as PB90-914100, $11.50 domestic, $23.00 foreign CSCL 01A
- This bibliography lists 529 reports, articles, and other documents introduced into the NASA scientific and technical information system in June 1990. Subject coverage includes: design, construction and testing of aircraft and aircraft engines; aircraft components, equipment and systems; ground support systems; and theoretical and applied aspects of aerodynamics and general fluid dynamics.

N89-29304* National Aeronautics and Space Administration, Washington, DC.

- AERODYNAMICS

N90-27548* National Aeronautics and Space Administration, Washington, DC.

- NTIS standing order as PB90-914100, $11.50 domestic, $23.00 foreign CSCL 01A
- This bibliography lists 529 reports, articles, and other documents introduced into the NASA scientific and technical information system in June 1990. Subject coverage includes: design, construction and testing of aircraft and aircraft engines; aircraft components, equipment and systems; ground support systems; and theoretical and applied aspects of aerodynamics and general fluid dynamics.

02 AERODYNAMICS

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

N77-85474* National Aeronautics and Space Administration. Hugh L. Dryden Flight Research Center, Edwards, CA.

SUPERCRITICAL WING TECHNOLOGY: A REPORT ON
AERODYNAMICS

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

N87-14284* # National Aeronautics and Space Administration. Lewis Research Center, Cleveland, OH.
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
ELLIPICAL 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-2523; L-16151; NAS 1.60:2653) Avail: NTIS HC A03/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 1.60:2653) Avail: NTIS HC A03/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, OH.
PRELIMINARY DESIGN OF TURBOPUMPS AND RELATED MACHINERY

02 AERODYNAMICS

FLIGHT EVALUATIONS
1972 133 p
(NASA-SP-301; C72-71337)

N87-10039* # National Aeronautics and Space Administration. Langley Research Center, Hampton, VA.
WIND-TUNNEL INVESTIGATION OF THE FLIGHT CHARACTERISTICS OF A CANARD GENERAL-AVIGATION AIRPLANE CONFIGURATION
D. R. SATRAN Oct. 1986 60 p
(NASA-TP-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 A02 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 27 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

N87-10839* # National Aeronautics and Space Administration. Langley Research Center, Hampton, VA.
STATIC INTERNAL PERFORMANCE OF SINGLE-EXPANSION-RAMP NOZZLES WITH THRUST-VECTORING CAPABILITY UP TO 60 DEG
(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, CA.
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
(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
BOUNDARY LAYER STABILITY, BOUNDARY LAYER TRANSITION, BOUNDARY VALUE PROBLEMS, CHANNEL FLOW, COMPUTATIONAL FLUID DYNAMICS, SPECTRAL METHODS

N87-20233# National Aeronautics and Space Administration.
Langley Research Center, Hampton, VA.
INVESTIGATION OF LEADING-EDGE FLAP PERFORMANCE ON DELTA AND DOUBLE-DELTA WINGS AT SUPERSONIC SPEEDS
PETER F. COVELL, RICHARD M. WOOD, and DAVID S. MILLER
Apr. 1987 125 p
(NASA-TP-2656; L-16143; NAS 1.60:2656) Avail: NTIS HC
A06/MF A01 CSCL 01A
DELTA WINGS, EXPERIMENT DESIGN, LEADING EDGE FLAPS, SUPERSONIC SPEED

N87-20238# National Aeronautics and Space Administration.
Langley Research Center, Cleveland, OH.
LEWIS INVERSE DESIGN CODE (LINDES): USERS MANUAL
JOSE M. SANZ Mar. 1987 67 p
(NASA-TP-2676; E-3221; NAS 1.60:2676) Avail: NTIS HC
A04/MF A01 CSCL 01A
AIRFOILS, CODING, DESIGN ANALYSIS, HODOGRAPH, INVERSIONS, TURBINE BLADES, USER MANUALS (COMPUTER PROGRAMS)

N87-20966# National Aeronautics and Space Administration.
Hugh L. Dryden Flight Research Center, Edwards, CA.
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-1184; 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
A03/MF A01 CSCL 01A
F-106 AIRCRAFT, FREE FLIGHT, VORTEX FLAPS, WIND TUNNEL MODELS, WIND-TUNNEL TESTS

N87-21871# National Aeronautics and Space Administration.
Langley Research Center, Hampton, VA.
NEW METHODS AND RESULTS FOR QUANTIFICATION OF LIGHTNING- AIRCRAFT ELECTRODYNAMICS
(NASA-TP-2737; L-16281; NAS 1.60:2737) Avail: NTIS HC
A04/MF A01 CSCL 01A
ELECTRODYNAMICS, F-106 AIRCRAFT, FLIGHT TESTS, LIGHTNING, RESEARCH AIRCRAFT

N87-21873# National Aeronautics and Space Administration.
Langley Research Center, Hampton, VA.
EFFECTS OF AFTERBODY BOATTAIL DESIGN AND EMPENNAGE ARRANGEMENT ON AEROPROPULSIVE CHARACTERISTICS OF A TWIN-ENGINE FIGHTER MODEL AT TRANSONIC SPEEDS
LINDA S. BANGERT, LAURENCE D. LEAVITT, and DAVID E. REUBUSH Jun. 1987 134 p
(NASA-TP-2704; L-16227; NAS 1.60:2704) Avail: NTIS HC
A07/MF A01 CSCL 01A
AFTERBODIES, AXISYMMETRIC FLOW, BOATTAILS, DRAG,
AERODYNAMICS

N87-22626"# 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 A03/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-16287; NAS 1.60:2733) Avail: NTIS HC A03/MF A01 CSCL 01A
- ANGLE OF ATTACK, CRUCIFORM WINGS, EXPERIMENTATION, HYPERSONIC SPEED, MACH NUMBER, MISSILES

N87-23597"# 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
(NASA-TP-2717; L-16248; NAS 1.60:2717) Avail: NTIS HC A04/MF A01 CSCL 01A
- AXISYMMETRIC BODIES, BOATTAILS, NOZZLE GEOMETRY, PERFORMANCE TESTS, TRADEOFFS, WEDGES

N87-24410"# National Aeronautics and Space Administration. Ames Research Center, Moffett Field, CA.

PROCEEDINGS OF THE 1985 NASA Ames Research Center's GROUND-EFFECTS WORKSHOP
(NASA-CP-2462; A-86391; NAS 1.55:2462) Avail: NTIS HC A19/MF A03 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 A02 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 1
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 A03 CSCL 01A
- CONICAL CAMBER, DELTA WINGS, FLOW DISTRIBUTION, FLOW VISUALIZATION, SUPERSONIC FLOW, WING LOADING

N87-25398"# National Aeronautics and Space Administration. Ames Research Center, Moffett Field, CA.

SUPERCOMPUTING IN AEROSPACE
(NASA-CP-2454; A-87082; NAS 1.55:2454) Avail: NTIS HC A13/MF A02 CSCL 01A
- COMPUTATIONAL ASTROPHYSICS, COMPUTATIONAL CHEMISTRY, COMPUTATIONAL FLUID DYNAMICS, COMPUTATIONAL GRIDS, COMPUTERIZED SIMULATION, CONFERENCES, INTERACTIONAL AERODYNAMICS, NAVIER-STOKES EQUATION, SUPERCOMPUTERS

N87-25031"# 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 and DON C. MARCUM, JR. Aug. 1987 28 p
(NASA-TP-2728; L-16236; 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 PANAIR
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 AERODYNAMICS, UNSTEADY FLOW, WINGS
AERODYNAMICS


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, INVISID FLOW, OSCILLATIONS, TRANSONIC FLOW, VISCOUS 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 A02 CSCL 01A CAMBER, DELTA WINGS, PRESSURE MEASUREMENT, SUBSONIC SPEED, THICKNESS, TWISTED WINGS


N88-10009*# National Aeronautics and Space Administration. Langley Research Center, Hampton, VA. WIND-TUNNEL INVESTIGATION OF A FULL-SCALE GENERAL AVIATION AIRPLANE EQUIPPED WITH AN ADVANCED NATURAL LAMINAR FLOW WING DANIEL G. MURRI and FRANK L. JORDAN, JR. Nov. 1987 136 p (NASA-TP-2772; L-16283; NAS 1.60:2772) Avail: NTIS HC A07/MF A01 CSCL 01A GENERAL AVIATION AIRCRAFT, LAMINAR FLOW AIRFOILS, WIND TUNNEL TESTS, WINGS


N88-10771*# National Aeronautics and Space Administration. Langley Research Center, Hampton, VA. EFFECT OF EMPENNAGE ARRANGEMENT ON SINGLE-ENGINE NOZZLE/AFTERBODY STATIC PRESSURES AT TRANSONIC SPEEDS WILLIAM P. HENDERSON and JAMES R. BURLEY, II Nov. 1987 230 p (NASA-TP-2753; L-16223; NAS 1.60:2753) Avail: NTIS HC A11/MF A02 CSCL 01A AFTERBODIES, AXISYMMETRIC FLOW, JET AIRCRAFT, JET ENGINES, NOZZLES, STATIC PRESSURE, TAIL ASSEMBLIES, TRANSONIC SPEED

N88-12454*# National Aeronautics and Space Administration. Langley Research Center, Hampton, VA. PLANFORM EFFECTS ON THE SUPERSONIC AERODYNAMICS OF MULTIBODY CONFIGURATIONS NAOMI MCMILLIN and RICHARD M. WOOD 1987 138 p (NASA-TP-2762; L-16312; NAS 1.60:2762) Avail: NTIS HC A07/MF A01 CSCL 01A AERODYNAMIC CHARACTERISTICS, MULTIBODY CONFIGURATIONS, PYLON MOUNTING, SUPERSONICS, ZERO LIFT

SIDESLIP, SUBSONIC SPEED, WIND TUNNEL MODELS, WINGLETS

N88-19412*# National Aeronautics and Space Administration. Ames Research Center, Moffett Field, CA. TRAJECTORY CHARACTERISTICS AND HEATING OF HYPERVELOCITY PROJECTILES HAVING LARGE BALLISTIC COEFFICIENTS
A03/MF A01 CSCL 01A
AERODYNAMIC HEATING, BALLISTIC TRAJECTORIES, HYPERVELOCITY PROJECTILES, TRAJECTORY ANALYSIS

N88-19416* National Aeronautics and Space Administration, Washington, DC. AERONAUTICAL ENGINEERING: A CUMULATIVE INDEX TO A CONTINUING BIBLIOGRAPHY
Jan. 1988 499 p (NASA-SP-7037(222); NAS 1.21:7037(222)) Avail: NTIS HC
$14.50 domestic, $29.00 foreign CSCL 01A

This bibliography is a cumulative index to the abstracts contained in NASA SP-7037(210) through NASA SP-7037(221) of Aeronautical Engineering: A Continuing Bibliography. NASA SP-7037 and its supplements have been compiled through the cooperative efforts of the American Institute of Aeronautics and Astronautics (AIAA) and the National Aeronautics and Space Administration (NASA). This cumulative index includes subject, personal author, corporate source, foreign technology, contract number, report number, and accession number indexes. Author

N88-19420*# National Aeronautics and Space Administration. Langley Research Center, Hampton, VA. AERODYNAMIC CHARACTERISTICS OF WINGS DESIGNED WITH A COMBINED-THEORY METHOD TO CRUISE AT A MACH NUMBER OF 4.5
A04/MF A01 CSCL 01A
AERODYNAMIC CHARACTERISTICS, AIRCRAFT DESIGN, CAMBERED WINGS, DESIGN ANALYSIS, HYPERSONIC SPEED, SUPERSONIC SPEED

N88-20257*# National Aeronautics and Space Administration. Ames Research Center, Moffett Field, CA. AN EXPERIMENTAL INVESTIGATION OF THE FLAP-LAG-TORSION AEROELASTIC STABILITY OF A SMALL-SCALE HINGELESS HELICOPTER ROTOR IN HOVER
AEROELASTICITY, FLAPS (CONTROL SURFACES), HELICOPTERS, HOVERING, RIGID ROTORS, STABILITY, TORSION

N88-20264*# National Aeronautics and Space Administration. Langley Research Center, Hampton, VA. A REVIEW OF TECHNOLOGIES APPLICABLE TO LOW-SPEED FLIGHT OF HIGH-PERFORMANCE AIRCRAFT INVESTIGATED IN THE LANGLEY 14 X 22 FOOT SUBSONIC TUNNEL
JOHN W. PAULSON, JR., P. FRANK QUINTO, DANIEL W. BANKS, GUY T. KEMMERLY, and GREGORY M. GATLIN May 1988 94 p (NASA-TP-2796; L-16364; NAS 1.60:2796) Avail: NTIS HC
A05/MF A01 CSCL 01A
AERODYNAMIC CONFIGURATIONS, FLIGHT TESTS, LOW SPEED, RESEARCH FACILITIES, SHORT TAKEOFF AIRCRAFT, TECHNOLOGY ASSESSMENT, V/STOL AIRCRAFT, WIND TUNNEL TESTS
02 AERODYNAMICS

N88-20280*# National Aeronautics and Space Administration. Langley Research Center, Hampton, VA.
STATIC PERFORMANCE OF AN AXISYMMETRIC NOZZLE WITH POST-EXIT VANES FOR MULTIAxis THRUST VECTORING
BOBBY L. BERRIER and MARY L. MASON May 1988 54 p (NASA-TP-2800; L-16371; NAS 1.60:2800) Avail: NTIS HC
A04/MF A01 CSCL 01A
AXISYMMETRIC BODIES, CONVERGENT-DIVERGENT NOZZLES, STATIC TESTS, THRUST VECTOR CONTROL, VANES

N88-21117*# National Aeronautics and Space Administration. Langley Research Center, Hampton, VA.
THE NASA LANGLEY LAMINAR-FLOW-CONTROL (LFC) EXPERIMENT ON A SWEPT, SUPERCRItical AIRFOIL: DESIGN OVERVIEW
A07/MF A01 CSCL 01A
BOUNDARY LAYER CONTROL, LAMINAR BOUNDARY LAYER, LAMINAR FLOW, SUPERCritical AIRFOILS, SWEPT WINGS

N88-21118*# National Aeronautics and Space Administration. Langley Research Center, Hampton, VA.
STATIC PERFORMANCE OF NONAXISYMMETRIC NOZZLES WITH YAW THRUST-VECTORING VANES
MARY L. MASON and BOBBY L. BERRIER May 1988 79 p (NASA-TP-2813; L-16389; NAS 1.60:2813) Avail: NTIS HC
A05/MF A01 CSCL 01A
CONVERGENT NOZZLES, CONVERGENT-DIVERGENT NOZZLES, STATIC TESTS, STATIC THRUST, THRUST VECTOR CONTROL

N88-23735*# National Aeronautics and Space Administration. Langley Research Center, Hampton, VA.
NUMERICAL SIMULATION OF SCRAMJET INLET FLOW FIELDS
AJAY KUMAR May 1986 29 p (NASA-TP-2517; L-16000; NAS 1.60:2517) Avail: NTIS HC
A03/MF A01 CSCL 01A
APPLICATIONS PROGRAMS (COMPUTERS), COMPUTATIONAL FLUID DYNAMICS, INLET FLOW, NAVIER-STOKES EQUATION, SUPERSONIC COMBUSTION RAMJET ENGINES, THREE DIMENSIONAL FLOW, TURBULENT FLOW

N88-23737*# National Aeronautics and Space Administration. Langley Research Center, Hampton, VA.
LAMINAR FLOW AIRCRAFT CERTIFICATION
A05/MF A01 CSCL 01A
AIRCRAFT DESIGN, CERTIFICATION, CONFERENCES, LAMINAR FLOW, LAMINAR FLOW AIRFOILS

N88-23757*# National Aeronautics and Space Administration. Langley Research Center, Hampton, VA.
AEROPROPULSIVE CHARACTERISTICS OF ISOLATED COMBINED TURBOJET/RAMJET NOZZLES AT MACH NUMBERS FROM 0 TO 1.2
A08/MF A01 CSCL 01A
MACH NUMBER, NOZZLE EFFICIENCY, NOZZLE GEOMETRY, RAMJET ENGINES, ROCKET NOZZLES, TURBINE ENGINES

N88-23760*# National Aeronautics and Space Administration. Langley Research Center, Hampton, VA.
SENSITIVITY OF F-106B LEADING-EDGE-VORTEX IMAGES TO FLIGHT AND VAPOR-SCREEN PARAMETERS
A05/MF A01 CSCL 01A
F-106 AIRCRAFT, IMAGE PROCESSING, LEADING EDGES, SCREEN EFFECT, TRANSONIC FLIGHT, VAPORS, VORTICES, WINGS

N88-28895*# National Aeronautics and Space Administration. Langley Research Center, Hampton, VA.
STEADY AND UNSTEADY TRANSONIC PRESSURE MEASUREMENTS ON A CLIPPED DELTA WING FOR PITCHING AND CONTROL-SURFACE OSCILLATIONS
A06/MF A01 CSCL 01A
CONTROL SURFACES, DELTA WINGS, LITTORAL CONTROL, OSCILLATIONS, PRESSURE MEASUREMENT, STEADY STATE, WIND TUNNEL TESTS

N88-29752*# National Aeronautics and Space Administration. Langley Research Center, Hampton, VA.
AERODYNAMICS IN GROUND EFFECT AND PREDICTED LANDING GROUND ROLL OF A FIGHTER CONFIGURATION WITH A SECONDARY-NOZZLE THRUST REVERSER
DANIEL W. BANKS Oct. 1988 131 p (NASA-TP-2824; L-16435; NAS 1.60:2824) Avail: NTIS HC
A07/MF A01 CSCL 01A
CASCADE FLOW, GROUND EFFECT (AERODYNAMICS), NOZZLE FLOW, ROLL, SHORT TAKEOFF AIRCRAFT, THRUST REVERSAL

N89-10020*# National Aeronautics and Space Administration. Langley Research Center, Hampton, VA.
WEAK-WAVE ANALYSIS OF SHOCK INTERACTION WITH A SLIPSTREAM
RAYMOND L. BARGER Nov. 1988 20 p (NASA-TP-2848; L-16469; NAS 1.60:2848) Avail: NTIS HC
A03/MF A01 CSCL 01A
COUNTERFLOW, SHOCK WAVE INTERACTION, SLIPSTREAMS

N89-10024*# National Aeronautics and Space Administration. Langley Research Center, Hampton, VA.
VALIDATION OF A PAIR OF COMPUTER CODES FOR ESTIMATION AND OPTIMIZATION OF SUBSONIC AERODYNAMIC PERFORMANCE OF SIMPLE HINGED-FLAP SYSTEMS FOR THIN SWEPT WINGS
A06/MF A01 CSCL 01A
AERODYNAMICS, COMPUTER PROGRAMS, FLAPPING WINGS, OPTIMIZATION, SUBSONIC FLOW, SWEPT WINGS

N89-10844*# National Aeronautics and Space Administration. Langley Research Center, Cleveland, OH.
THREE COMPONENT LASER ANEMOMETER MEASUREMENTS IN AN ANNULAR CASCADE OF CORE TURBINE VANES WITH CONTOURED END WALL
LOUIS J. GOLDMAN and RICHARD G. SEASHOLTZ Nov. 1988 44 p (NASA-TP-2846; E-4183; NAS 1.60:2846) Avail: NTIS HC
A05/MF A01 CSCL 20D
ANNULAR FLOW, CASCADE FLOW, FABRY-PEROT
INTERFEROMETERS, FLOW MEASUREMENT, LASER ANEMOMETERS, STATOR BLADES, VELOCITY MEASUREMENT.

Received 12/11/88

N89-10849*# National Aeronautics and Space Administration. Ames Research Center, Moffett Field, CA.

THE 1987 GROUND VORTEX WORKSHOP


CONFERENCES, EXHAUST GASES, GROUND EFFECT (AERODYNAMICS), SHORT TAKEOFF AIRCRAFT, VERTICAL TAKEOFF AIRCRAFT, VORTICES

N89-12543*# National Aeronautics and Space Administration. Langley Research Center, Hampton, VA.

A SPECTRAL COLLOCATION SOLUTION TO THE COMPRESSIBLE STABILITY EIGENVALUE PROBLEM

Michele G. Macareag, Craig L. Streett, and M. Youssuff Hussaini Washington, D.C. Dec. 1988 42 p (NASA-TP-2859; L-16256; NAS 1.60:2859) Avail: NTIS HC A03/MF A01 CSCL 01A

BOUNDARY LAYER FLOW, COMPRESSIBLE FLOW, COMPUTATIONAL GRIDS, FLOW DISTRIBUTION, FLOW STABILITY, SHEAR FLOW

N89-14213*# National Aeronautics and Space Administration. Langley Research Center, Hampton, VA.

THRUST-REVERSER FLOW INVESTIGATION ON A TWIN-ENGINE TRANSPORT


ENGINE TESTS, FREE FLOW, GROUND EFFECT (AERODYNAMICS), REVERSED FLOW, THRUST REVERSAL, TRANSIENT AIRCRAFT

N89-15888*# National Aeronautics and Space Administration. Langley Research Center, Hampton, VA.

INTEGRATION EFFECTS OF PYLON GEOMETRY ON A HIGH-WING TRANSPORT AIRPLANE


INSTALLING, NACELLES, PYLONS, TRANSPORT AIRCRAFT, WINGS

N89-17568*# National Aeronautics and Space Administration. Langley Research Center, Hampton, VA.

NASA SC(2)-0714 AIRFOIL DATA CORRECTED FOR SIDEWALL-boundary-layer effects in the Langley 0.3-METER TRANSONIC CRYOGENIC TUNNEL

Renaldo V. Jenkins Washington, DC. Mar. 1989 58 p (NASA-TP-2890; L-16385; NAS 1.60:2890) Avail: NTIS HC A04/MF A01 CSCL 01A

BOUNDARY LAYERS, CRYOGENIC WIND TUNNELS, SUPERCritical AIRFOILS, WIND TUNNEL WALLS

N89-17579*# National Aeronautics and Space Administration. Ames Research Center, Moffett Field, CA.

TIP AERODYNAMICS AND ACOUSTICS TEST: A REPORT AND DATA SURVEY


In a continuing effort to understand helicopter rotor tip aerodynamics and acoustics, a flight test was conducted by NASA Ames Research Center. The test was performed using the NASA White Cobra and a set of highly instrumented blades. All aspects of the flight test instrumentation and test procedures are explained.

Additionally, complete data sets for selected test points are presented and analyzed. Because of the high volume of data acquired, only selected data points are presented. However, access to the entire data set is available to the researcher on request.

Author

N89-19232*# National Aeronautics and Space Administration. Langley Research Center, Hampton, VA.

DRAG MEASUREMENTS ON A LAMINAR-FLOW BODY OF REVOLUTION IN THE 13-INCH MAGNETIC SUSPENSION AND BALANCE SYSTEM

David A. Dress 1989 37 p (NASA-TP-2895; L-16483; NAS 1.60:2895) Avail: NTIS HC A03/MF A01 CSCL 01A

AERODYNAMIC BALANCE, BODIES OF REVOLUTION, DRAG MEASUREMENT, LAMINAR FLOW, MAGNETIC SUSPENSION
A03/MF A01 CSCL 01A

TRAJECTORIES ON AN INHOMOGENEOUS SURFACE
MATHEMATICAL MODELS, SURFACE WAVES, FLUID DYNAMICS, HYDRODYNAMICS, INHOMOGENEITY,
(NASA-TP-2929; L-1655; NAS 1.60:2929) Avail: NTIS HC
RAYMOND L. BARGER Washington Aug. 1989 14 p

A03/MF A01 CSCL 01A

A PROCEDURE FOR COMPUTING SURFACE WAVE STALLING, AIRFOILS, RAIN, STEADY STATE, TRANSIENT
A05/MF A01 CSCL 01A

CHARACTERISTICS OF A WING IN SIMULATED HEAVY RAIN
Langley Research Center, Hampton, VA.
N89-26811*# National Aeronautics and Space Administration.

LOW-SPEED, HIGH-LIFT AERODYNAMIC CHARACTERISTICS OF SLENDER, HYPERSONIC ACCELERATOR-TYPE CONFIGURATIONS
GREGORY M. GATLIN Washington Nov. 1989 46 p
(NASA-TP-2945; L-16550; NAS 1.60:2945) Avail: NTIS HC
A05/MF A01 CSCL 01A

AERODYNAMIC CHARACTERISTICS, AEROSPACE PLANES, AIRCRAFT DESIGN, BODY-WING CONFIGURATIONS, HYPERSONIC FLOW, LIFT

A05/MF A01 CSCL 01A

RESEARCH IN NATURAL LAMINAR FLOW AND LAMINAR-FLOW CONTROL, PART 1
(NASA-CP-2487-PT-1; L-16350-PT-1; NAS 1.55:2487-PT-1) Avail: NTIS HC A14/MF A02 CSCL 01A
BOUNDARY LAYER CONTROL, BOUNDARY LAYER TRANSITION, CONFERENCES, FLOW STABILITY, LAMINAR BOUNDARY LAYER, LAMINAR FLOW, LAMINAR FLOW AIRFOILS

A05/MF A01 CSCL 01A

RESEARCH IN NATURAL LAMINAR FLOW AND LAMINAR-FLOW CONTROL, PART 2
(NASA-CP-2487-PT-2; L-16350-PT-2; NAS 1.55:2487-PT-2) Avail: NTIS HC A15/MF A02 CSCL 01A
AIRCRAFT DESIGN, BOUNDARY LAYER CONTROL, BOUNDARY LAYER TRANSITION, COMPUTATIONAL FLUID DYNAMICS, CONFERENCES, LAMINAR BOUNDARY LAYER, LAMINAR FLOW, LAMINAR FLOW AIRFOILS, WIND TUNNEL TESTS

A05/MF A01 CSCL 01A

RESEARCH IN NATURAL LAMINAR FLOW AND LAMINAR-FLOW CONTROL, PART 3
1987
(NASA-CP-2487-PT-3; L-16350-PT-3; NAS 1.55:2487-PT-3)
Avail: NTIS HC A17/MF A03 CSCL 01A
AIRCRAFT DESIGN, BOUNDARY LAYER CONTROL,
BOUNDARY LAYER STABILITY, BOUNDARY LAYER
TRANSITION, CONFERENCES, LAMINAR FLOW, LAMINAR
FLOW AIRFOILS

N90-14185*# National Aeronautics and Space Administration.
Langley Research Center, Hampton, VA.
MEASURED AND PREDICTED AERODYNAMIC COEFFICIENTS
AND SHOCK SHAPES FOR AEROASSIST FLIGHT
EXPERIMENT (AFE) CONFIGURATION
WILLIAM L. WELLS 1989 52 p
(NASA-TP-2956; L-16644; NAS 1.60:2956)
Avail: NTIS HC A04/MF A01 CSCL 01A
AERODYNAMIC CHARACTERISTICS, AERO-
DYNAMIC COEFFICIENTS, AERODYNAMIC CONFIGURA-
TIONS, BLUNT BODIES, HYPERSONIC FLOW, HYPERSONIC
VEHICLES, NORMAL SHOCK WAVES, WIND TUNNEL TESTS

N90-14187*# National Aeronautics and Space Administration.
Langley Research Center, Hampton, VA.
VALIDATION OF A COMPUTER CODE FOR ANALYSIS OF
SUBSONIC AERODYNAMIC PERFORMANCE OF WINGS WITH
FLAPS IN COMBINATION WITH A CANARD OR HORIZONTAL
TAIL AND AN APPLICATION TO OPTIMIZATION
HARRY W. CARLSON (PRC Systems Services Co., Hampton, VA.),
CHRISTINE M. DARDEN, and MICHAEL J. MANN Jan. 1990
125 p
(NASA-TP-2961; L-16611; NAS 1.60:2961)
Avail: NTIS HC A06/MF A01 CSCL 01A
CANARD CONFIGURATIONS, COMPUTER PROGRAMS,
FLAPS (CONTROL SURFACES), HORIZONTAL TAIL SURFACES,
PROGRAM VERIFICATION (COMPUTERS)

N90-15882*# National Aeronautics and Space Administration.
Langley Research Center, Hampton, VA.
ROTOR INDUCED-INFLOW-RATIO MEASUREMENTS AND
CAMRAD CALCULATIONS
contains color illustrations
(DA PROJ. 111-62211-A-47-AA)
(NASA-TP-2946; L-16594; NAS 1.60:2946;
AVSCOM-TM-89-B-010; AD-A219296) Avail: NTIS HC
A03/MF A01 CSCL 01A
BLADE TIPS, BLADE-VORTEX INTERACTION, COMPUTER
PROGRAMS, FLOW MEASUREMENT, HELICOPTER WAKES,
INLET FLOW, MATHEMATICAL MODELS

N90-16710*# National Aeronautics and Space Administration.
Langley Research Center, Hampton, VA.
NASA SUPERCRITICAL AIRFOILS: A MATRIX OF
FAMILY-RELATED AIRFOILS
CHARLES D. HARRIS Washington Mar. 1990 73 p
(NASA-TP-2969; L-16641; NAS 1.60:2969)
Avail: NTIS HC A04/MF A01 CSCL 01A
AERODYNAMIC CHARACTERISTICS, AIRCRAFT DESIGN,
SUPERCRITICAL AIRFOILS

N90-19193*# National Aeronautics and Space Administration.
Langley Research Center, Hampton, VA.
STATIC INVESTIGATION OF A TWO-DIMENSIONAL
CONVERGENT-DIVERGENT EXHAUST NOZZLE WITH
MULTIAXIS THRUST-VECTORING CAPABILITY
JOHN G. TAYLOR Washington Apr. 1990 104 p
(NASA-TP-2973; L-16632; NAS 1.60:2973)
Avail: NTIS HC A05/MF A01 CSCL 01A
CONVERGENT-DIVERGENT NOZZLES, EXHAUST NOZZLES,
NOZZLE DESIGN, NOZZLE EFFICIENCY, STATIC TESTS,
THRUST VECTOR CONTROL

N90-19200*# National Aeronautics and Space Administration.
Langley Research Center, Hampton, VA.
INTERNAL PERFORMANCE OF TWO NOZZLES UTILIZING
GIMBAL CONCEPTS FOR THRUST VECTORING
BOBBY L. BERRIER and JOHN G. TAYLOR Washington Apr.
1990 128 p
(NASA-TP-2991; L-16722; NAS 1.60:2991)
Avail: NTIS HC A07/MF A01 CSCL 01A
CONVERGENT-DIVERGENT NOZZLES, GIMBALS, NOZZLE
EFFICIENCY, NOZZLE GEOMETRY, THRUST VECTOR
CONTROL

N90-20046*# National Aeronautics and Space Administration.
Langley Research Center, Hampton, VA.
EXPERIMENTAL AND THEORETICAL AERODYNAMIC
CHARACTERISTICS OF A HIGH-LIFT SEMISPAN WING
MODEL
ZACHARY T. APPLIN and GARL L. GENTRY, JR. Washington
May 1990 111 p
(NASA-TP-2990; L-16441; NAS 1.60:2990)
Avail: NTIS HC A06/MF A01 CSCL 01A
AERODYNAMIC CHARACTERISTICS, AERODYNAMIC
CONFIGURATIONS, AIRFOIL PROFILES, BOUNDARY LAYER
CONTROL, COMPUTER PROGRAMS, LAMINAR BOUNDARY
LAYER, PANEL METHOD (FLUID DYNAMICS), SEMISPAN
MODELS

N90-20946*# National Aeronautics and Space Administration.
Langley Research Center, Hampton, VA.
DISCRETE-VORTEX MODEL FOR THE SYMMETRIC-VORTEX
FLOW ON CONES
THOMAS G. GAINER Washington May 1990 29 p
(NASA-TP-2989; L-16586; NAS 1.60:2989)
Avail: NTIS HC A03/MF A01 CSCL 01A
CONICAL BODIES, FLOW DISTRIBUTION, MATHEMATICAL
MODELS, POTENTIAL FLOW, VORTICES

N90-22531*# National Aeronautics and Space Administration.
Langley Research Center, Hampton, VA.
DYNAMIC GROUND-EFFECT MEASUREMENTS ON THE F-15
STOL AND MANEUVER TECHNOLOGY DEMONSTRATOR
(S/MTD) CONFIGURATION
(NASA-TP-3000; L-16555; NAS 1.60:3000)
Avail: NTIS HC A05/MF A01 CSCL 01A
AERODYNAMIC CHARACTERISTICS, AIRCRAFT CON-
FIGURATIONS, AIRCRAFT LANDING, F-15 AIRCRAFT, GROUND
EFFECT (AERODYNAMICS), GROUND TESTS, SHORTTAKE-
OFF AIRCRAFT

N90-24239*# National Aeronautics and Space Administration.
Langley Research Center, Hampton, VA.
AERODYNAMIC CHARACTERISTICS OF TWO ROTORCRAFT
AIRFOILS DESIGNED FOR APPLICATION TO THE INBOARD
REGION OF A MAIN ROTOR BLADE
KEVIN W. NOONAN (Army Aerostructures Directorate, Hampton,
VA.) Washington Jul. 1990 89 p
(DA PROJ. 1L1-62211-A-47-AA)
(NASA-TP-3008; L-16521; NAS 1.60:3008;
AVSCOM-TR-90-B-005) Avail: NTIS HC
AERODYNAMIC CHARACTERISTICS, ROTARY WINGS, ROTORCRAFT
AIRCRAFT

N90-25938*# National Aeronautics and Space Administration.
Langley Research Center, Hampton, VA.
AERODYNAMIC CHARACTERISTICS OF A THREE SURFACE
OFF AIRCRAFT
GEFFREY A. GANNON (Army Research Laboratory, Adelphi,
MD.), MARK C. FRASSINELLI (Air Force Wright Aeronautical Labs.,
Wright-Patterson AFB, OH.) and GEORGE T. CARSON, JR.
Washington Aug. 1990 59 p
02 AERODYNAMICS

(NASA-TP-3036; L-16800; NAS 1.60:3036) Avail: NTIS HC A04/MF A01 CSCL 01A
AERODYNAMIC CHARACTERISTICS, CANARD CONFIGURATIONS, F-15 AIRCRAFT, NOZZLE FLOW, NOZZLE GEOMETRY, TAIL ASSEMBLIES, TRANSONIC WIND TUNNELS

N90-27649* # National Aeronautics and Space Administration. Langley Research Center, Hampton, VA.
DATA ACQUISITION, FLOW CHARACTERISTICS, GROUND EFFECT (AERODYNAMICS), SUBSONIC WIND TUNNELS, USER REQUIREMENTS, WIND TUNNEL APPARATUS

N90-28503* # National Aeronautics and Space Administration. Ames Research Center, Moffett Field, CA.
COUPLING, HOVERING, HOVERING STABILITY, MATHEMATICAL MODELS, RIGID ROTORS, ROTARY WINGS

03 AIR TRANSPORTATION AND SAFETY

Includes passenger and cargo air transport operations; and aircraft accidents.

N87-10054* # National Aeronautics and Space Administration. Langley Research Center, Hampton, VA.
AIRCRAFT, HOVERING, HOVERING STABILITY, AERODYNAMIC CHARACTERISTICS, AIRCRAFT CONTROL, MICROBURSTS (METEOROLOGY), RADAR MEASUREMENT, WIND SHEAR

N87-29469* # National Aeronautics and Space Administration. Langley Research Center, Hampton, VA.
JET TRANSPORT FLIGHT OPERATIONS USING COCKPIT DISPLAY OF TRAFFIC INFORMATION DURING INSTRUMENT METEOROLOGICAL CONDITIONS: SIMULATION EVALUATION DAVID H. WILLIAMS and DOUGLAS C. WELLS May 1986 50 p (NASA-TP-2567; L-16091; NAS 1.60:2567) Avail: NTIS HC A09/MF A01 CSCL 01C
AIRCRAFT OPERATIONS, JET AIRCRAFT, DISPLAY DEVICES, INSTRUMENT APPROACH, JET AIRCRAFT, TRANSPORT AIRCRAFT, VIDEO COMMUNICATION, WORKLOADS (PSYCHOPHYSIOLOGY)

N88-14970* # National Aeronautics and Space Administration. Langley Research Center, Hampton, VA.
AIRCRAFT, COCKPIT SIMULATORS, DISPLAY DEVICES, INSTRUMENT APPROACH, JET AIRCRAFT, TRANSPORT AIRCRAFT, WIND SHEAR

N88-17616* # National Aeronautics and Space Administration. Langley Research Center, Hampton, VA.
AIRBORNE EQUIPMENT, AIRCRAFT CONTROL, COCKPIT SIMULATORS, DISPLAY DEVICES, DOPPLER RADAR, FLIR DETECTORS, REMOTE SENSING, WIND SHEAR

N88-21144* # National Aeronautics and Space Administration. Wallops Flight Center, Wallops Island, VA.
INVESTIGATION OF THE MISFUELING OF RECIPROCATING PISTON AIRCRAFT ENGINES J. HOLLAND SCOTT, JR. Mar. 1988 82 p (NASA-TP-2803; NAS 1.60:2803) Avail: NTIS HC A05/MF A01 CSCL 01C
AIRCRAFT, PISTON AIRCRAFT ENGINES, AIRBORNE EQUIPMENT, AIRCRAFT CONTROL, CONFERENCE, DOPPLER RADAR, INFORMATION TRANSFER, OPTICAL RADAR, WARNING SYSTEMS, WIND SHEAR

N89-26344* # National Aeronautics and Space Administration. Langley Research Center, Hampton, VA.
AIRCRAFT, MICROBURSTS (METEOROLOGY), SHEAR FLOW, WIND SHEAR
04 AIRCRAFT COMMUNICATIONS AND NAVIGATION

Includes digital and voice communication with aircraft; air navigation systems (satellite and ground based); and air traffic control.

N89-11726*# National Aeronautics and Space Administration. Langley Research Center, Hampton, VA.
A SIMULATOR INVESTIGATION OF THE USE OF DIGITAL DATA LINK FOR PILOT/ATC COMMUNICATIONS IN A SINGLE PILOT OPERATION
DAVID A. HINTON and GARY W. LOHR (Embry-Riddle Aeronautical Univ., Daytona Beach, Fla.) Jun. 1988 41 p (NASA-TP-2837; L-16457; NAS 1.60:2837) Avail: NTIS HC A03/MF A01 CSCL 17B
DATA TRANSMISSION, DIGITAL DATA, PILOT PERFORMANCE, RADIO COMMUNICATION, SIMULATION, VOICE COMMUNICATION

N89-15900*# National Aeronautics and Space Administration. Langley Research Center, Hampton, VA.
A PILOTED SIMULATION STUDY OF DATA LINK ATC MESSAGE EXCHANGE
AIR TRAFFIC CONTROL, DATA LINKS, FLIGHT SIMULATION, MESSAGE PROCESSING

N89-15901*# National Aeronautics and Space Administration. Langley Research Center, Hampton, VA.
SIMULATION EVALUATION OF TIMER, A TIME-BASED, TERMINAL AIR TRAFFIC, FLOW-MANAGEMENT CONCEPT
AIR TRAFFIC CONTROL, AUTOMATIC CONTROL, EVALUATION, MANAGEMENT PLANNING, SCHEDULING, SIMULATION, TERMINAL FACILITIES

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
AERODYNAMIC DESIGN, COMPUTER AIDED DESIGN, CONFERENCES, DESIGN ANALYSIS, OPTIMIZATION, STRUCTURAL DESIGN

N87-11750*# National Aeronautics and Space Administration. Langley Research Center, Hampton, VA.
RECENT EXPERIENCES IN MULTIDISCIPLINARY ANALYSIS AND OPTIMIZATION, PART 2
AERODYNAMIC DESIGN, COMPUTER AIDED DESIGN, HELICOPTERS, OPTIMIZATION

N87-15959*# National Aeronautics and Space Administration. Ames Research Center, Moffett Field, CA.
LARGE-SCALE STATIC INVESTIGATION OF CIRCULATION-CONTROL-WING CONCEPTS APPLIED TO UPPER SURFACE-BLOWING AIRCRAFT
CIRCULATION CONTROL AIRFOILS, GROUND TESTS, LIFT AUGMENTATION, SHORT TAKEOFF AIRCRAFT, STATIC TESTS, THUST CONTROL, TURBOFAN ENGINES, UPPER SURFACE BLOWING

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, III, JAMES M. PATTON, JR., and STEVEN M. SLIWA Feb. 1987 125 p (NASA-TP-2644; L-16184; 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

N87-17690*# National Aeronautics and Space Administration. Langley Research Center, Hampton, VA.
EXPLOITING SYMMETRIES IN THE MODELING AND ANALYSIS OF TIRES
AHMED K. NOOR (Joint Inst. for Advancement of Flight Sciences, Hampton, Va.), CARL M. ANDERSEN (College of William and Mary, Hampton, Va.), and JOHN A. TANNER Mar. 1987 63 p (NCG-1-40) (NASA-TP-2649; L-16165; NAS 1.60:2649) Avail: NTIS HC A04/MF A01 CSCL 01C
FINITE ELEMENT METHOD, MATHEMATICAL MODELS, SYMMETRY, TIRES
05 AIRCRAFT DESIGN, TESTING AND PERFORMANCE

N87-17693*# National Aeronautics and Space Administration. 

N87-20990*# National Aeronautics and Space Administration. 
Ames Research Center, Moffett Field, CA. SUMMARY OF STUDIES TO REDUCE WING-MOUNTED PROP-FAN 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, PROP-FAN TECHNOLOGY, TRANSPORT AIRCRAFT, WIND TUNNEL TESTS

N87-23614*# National Aeronautics and Space Administration. 

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), SPASHING, 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 VORTICES

N87-29497*# National Aeronautics and Space Administration. 

N87-29499*# National Aeronautics and Space Administration. 

N88-12480*# National Aeronautics and Space Administration. 
Langley Research Center, Hampton, VA. EFFECT OF MOTION CUES DURING COMPLEX CURVED APPROACH AND LANDING TASKS: A PILOTED SIMULATION STUDY CHARLES H. SCANLON (Arkansas State Univ., State University.) Dec. 1987 28 p (NCC-1-107) (NASA-TP-2773; L-16351; NAS 1.60:2773) Avail: NTIS HC A03/MF A01 CSCL 01C APPROACH, CUES, LANDING, MICROWAVE LANDING SYSTEMS, MOTION, PILOT PERFORMANCE, TRACKING (POSITION), WORKLOADS (PSYCHOPHYSIOLOGY)

N88-16853*# National Aeronautics and Space Administration. 

N88-19457*# National Aeronautics and Space Administration. 
Ames Research Center, Moffett Field, CA. A PERSPECTIVE ON 15 YEARS OF PROOF-OF-CONCEPT AIRCRAFT DEVELOPMENT AND FLIGHT RESEARCH AT AMES-MOFFETT BY THE ROTORCRAFT AND POWERED-LIFT FLIGHT PROJECTS DIVISION, 1970-1985 DAVID D. FEW Aug. 1987 55 p (NASA-RP-1187; A-86404; NAS 1.61:1187) Avail: NTIS HC A04/MF A01 CSCL 01C A proof-of-concept (POC) aircraft is defined and the concept of interest described for each of the six aircraft developed by the Ames-Moffett Rotorcraft and Powered-Lift Flight Projects Division from 1970 through 1985; namely, the OV-10, the C-8A Augmentor Wing, the Quiet Short-Haul Research Aircraft (QSRA), the XV-15 Tilt Rotor Research Aircraft (TRRA), the Rotor Systems Research Aircraft (RSRA)-compound, and the yet-to-fly RSRA/X-Wing Aircraft. The program/project chronology and most noteworthy features of the concepts are reviewed. The paper discusses the significance of each concept and the project demonstrating it; it
briefly looks at what concepts are on the horizon as potential POC research aircraft and emphasizes that no significant advanced concept in aviation technology has ever been accepted by civilian or military users without first completing a demonstration through flight testing.

Author

N88-21153# National Aeronautics and Space Administration. Hugh L. Dryden Flight Research Center, Edwards, CA. DEVELOPMENT AND FLIGHT TEST OF AN EXPERIMENTAL MANEUVER AUTOPILOT FOR A HIGHLY MANEUVERABLE AIRCRAFT

EUGENE L. DUKE, FRANK P. JONES, and RALPH B. RONCOLI

Sep. 1986 61 p (NASA-TP-2618; H-1258; NAS 1.60:2618) Avail: NTIS HC A04/MF A01 CSCL 01C

AUTOMATIC CONTROL, AUTOMATIC PILOTS, FLIGHT TESTS, HIGHLY MANEUVERABLE AIRCRAFT

N88-21157# National Aeronautics and Space Administration. Langley Research Center, Hampton, VA. STATIC MECHANICAL PROPERTIES OF 30 X 11.5 - 14.5, TYPE 8 AIRCRAFT TIRES OF BIAS-PLY AND RADIAL-BELTED DESIGN

PAMELA A. DAVIS and MERCEDES C. LOPEZ

May 1988 24 p (NASA-TP-2810; L-16374; NAS 1.60:2810) Avail: NTIS HC A03/MF A01 CSCL 01C

AIRCRAFT TIRES, MECHANICAL PROPERTIES, STATIC TESTS

N88-22031# National Aeronautics and Space Administration. Langley Research Center, Hampton, VA. SHAPE SENSITIVITY ANALYSIS OF WING STATIC AEROELASTIC CHARACTERISTICS

JEAN-FRANCOIS M. BARTHELEMY and FRED D. BERGEN (Virginia Polytechnic Inst. and State Univ., Blacksburg) May 1988 30 p (NASA-TP-2808; L-16418; NAS 1.60:2808) Avail: NTIS HC A03/MF A01 CSCL 01C

AEROELASTICITY, DYNAMIC RESPONSE, SENSITIVITY, WING LOADING, WING PROFILES

N88-24623# National Aeronautics and Space Administration. Langley Research Center, Hampton, VA. NONLINEAR PROGRAMMING EXTENSIONS TO RATIONAL FUNCTION APPROXIMATION METHODS FOR UNSTEADY AERODYNAMIC FORCES


AERODYNAMIC FORCES, AERODYNAMICS, APPROXIMATION, EQUATIONS OF MOTION, FLEXIBLE BODIES, NONLINEAR PROGRAMMING, OPTIMIZATION

N89-23448# National Aeronautics and Space Administration. Langley Research Center, Hampton, VA. HOT-JET SIMULATION IN CRYOGENIC WIND TUNNELS


In order to evaluate hot jet simulation capability in cryogenic wind tunnel testing, simple theoretical calculations were performed. The similarity parameters, isentropic flow properties, and normal shock relations were calculated for a variety of jet simulation techniques. The results were compared with those estimated for a full scale flight condition. It was shown that the cryogenic wind tunnel testing provides an opportunity for the most accurate hot jet simulation technique. By using a compressed nitrogen gas at ambient or moderately elevated temperatures as a jet gas, most all of the relevant similarity parameters including the jet temperature and velocity ratios and the Reynolds numbers, can be set to the full scale flight values. The only exception is the ratio of specific heats for jet flow. In an attempt to match the ratio of specific heats for the turbojet flow, gases other than pure nitrogen were considered. It was found that a nitrogen/methane mixture at moderately elevated temperature behaves like the real combustion gas. Using this mixture as a jet gas, complete simulation of the full scale turbojet exhaust becomes possible in cryogenic wind tunnels.

Author

N89-25146# National Aeronautics and Space Administration. Langley Research Center, Hampton, VA. RECENT ADVANCES IN MULTIDISCIPLINARY ANALYSIS AND OPTIMIZATION, PART 1


AIRCRAFT DESIGN, COMPUTATIONAL FLUID DYNAMICS, COMPUTER AIDED DESIGN, CONFERENCES, EXPERT SYSTEMS, OPTIMIZATION, STRUCTURAL ENGINEERING

N89-25173# National Aeronautics and Space Administration. Langley Research Center, Hampton, VA. RECENT ADVANCES IN MULTIDISCIPLINARY ANALYSIS AND OPTIMIZATION, PART 2


AIRCRAFT DESIGN, ARTIFICIAL INTELLIGENCE, COMPUTER AIDED DESIGN, CONFERENCES, DESIGN ANALYSIS, OPTIMIZATION, STRUCTURAL ANALYSIS, STRUCTURAL DESIGN

N89-25201# National Aeronautics and Space Administration. Langley Research Center, Hampton, VA. RECENT ADVANCES IN MULTIDISCIPLINARY ANALYSIS AND OPTIMIZATION, PART 3


AIRCRAFT DESIGN, COMPUTER AIDED DESIGN, COMPUTERIZED SIMULATION, CONFERENCES, CONTROL THEORY, DESIGN ANALYSIS, FLEXIBLE SPACECRAFT, LARGE SPACE STRUCTURES, OPTIMIZATION, SPACECRAFT DESIGN, STRUCTURAL DESIGN, STRUCTURAL ENGINEERING, SYSTEMS ENGINEERING

N89-26544# National Aeronautics and Space Administration. Ames Research Center, Moffett Field, CA. METHOD FOR EXPERIMENTAL DETERMINATION OF FLUTTER SPEED BY PARAMETER IDENTIFICATION

E. NISSIM (Technion - Israel Inst. of Tech., Haifa) and GLENN B. GILYARD Washington Jun. 1989 44 p Previously announced in IAA as A89-30801 (NASA-TP-2923; H-15010; NAS 1.60:2923) Avail: NTIS HC A03/MF A01 CSCL 01C

AEROELASTICITY, DYNAMIC PRESSURE, FLIGHT TESTS, FLUTTER, PARAMETER IDENTIFICATION

N90-12589# National Aeronautics and Space Administration. Ames Research Center, Moffett Field, CA. POWERED-LIFT AIRCRAFT TECHNOLOGY

W. H. DECKERT and J. A. FRANKLIN 1989 36 p Original
contains color illustrations
(NASA-SP-501; NAS 1.21:501; LC-89-39482) Avail: SCD HC
$4.25 as 033-000-01062-1; NTIS HC A03/MF A01 CSCL 01C

Powered lift aircraft have the ability to vary the magnitude and direction of the force produced by the propulsion system so as to control the overall lift and streamwise force components of the aircraft, with the objective of enabling the aircraft to operate from minimum sized terminal sites. Power lift technology has contributed to the development of the jet lift Harrier and to the forthcoming operational V-22 Tilt Rotor and the C-17 military transport. This technology will soon be expanded to include supersonic fighters with short takeoff and vertical landing capability, and will continue to be used for the development of short- and vertical-takeoff and landing transport. An overview of this field of aeronautical technology is provided for several types of powered lift aircraft. It focuses on the description of various powered lift concepts and their operational capability. Aspects of aerodynamics and flight controls pertinent to powered lift are also discussed. Author

N90-14220*# National Aeronautics and Space Administration. Ames Research Center, Moffett Field, CA.
GLOBAL STRATOSPHERIC CHANGE: REQUIREMENTS FOR A VERY-HIGH-ALTITUDE AIRCRAFT FOR ATMOSPHERIC RESEARCH
1989 41 p Workshop held in Truckee, CA, 15-16 Jul. 1989
(NASA-CP-10041; A-89243; NAS 1.55:10041) Avail: NTIS HC
A03/MF A01 CSCL 01C

ATMOSPHERIC CHEMISTRY, FLIGHT CHARACTERISTICS, METEOROLOGICAL FLIGHT, REMOTE SENSING, STRATOSPHERE, U-2 AIRCRAFT

N90-15100*# National Aeronautics and Space Administration. Ames Research Center, Moffett Field, CA.
THE EFFECTIVENESS OF VANE-AILERON EXCITATION IN THE EXPERIMENTAL DETERMINATION OF FLUTTER SPEED BY PARAMETER IDENTIFICATION
ELI NISSIM (Technion - Israel Inst. of Tech., Haifa.) Jan. 1990 23 p
(NASA-TP-2971; H-1516; NAS 1.60:2971) Avail: NTIS HC
A03/MF A01 CSCL 01C

EXCITATION, FLUTTER, PARAMETER IDENTIFICATION, VANES

N90-15902*# National Aeronautics and Space Administration. Langley Research Center, Hampton, VA.
EVALUATION OF TWO TRANSPORT AIRCRAFT AND SEVERAL GROUND TEST VEHICLE FRICTION MEASUREMENTS OBTAINED FOR VARIOUS RUNWAY SURFACE TYPES AND CONDITIONS. A SUMMARY OF TEST RESULTS FROM JOINT FAA/NASA RUNWAY FRICTION PROGRAM
THOMAS J. YAGER, WILLIAM A. Vogler (PRC Kentron, Inc., Hampton, VA.), and PAUL BALDASARE Washington Feb. 1990 301 p
(NASA-TP-2917; L-16536; NAS 1.60:2917) Avail: NTIS HC
A14/MF A02 CSCL 01C

AIRCRAFT TIRES, ASPHALT, CONCRETES, FRICTION MEASUREMENT, GROUND TESTS, RUNWAY CONDITIONS, TRANSPORT AIRCRAFT

N90-17627*# National Aeronautics and Space Administration. Langley Research Center, Hampton, VA.
SIMULATED-AIRLINE-SERVICE FLIGHT TESTS OF LAMINAR-FLOW CONTROL WITH PERFORATED-SURFACE SUCTION SYSTEM
(NASA-TP-2966; L-16589; NAS 1.60:2966) Avail: NTIS HC
A03/MF A01 CSCL 01C

BOUNDARY LAYER CONTROL, C-140 AIRCRAFT, LAMINAR FLOW, LEADING EDGES, PERFORATION, SUCTION

N90-18385*# National Aeronautics and Space Administration. Langley Research Center, Hampton, VA.
FUSELAGE DESIGN FOR A SPECIFIED MACH-SLICED AREA DISTRIBUTION
RAYMOND L. BARGER and MARY S. ADAMS Washington Feb. 1990 88 p
(NASA-TP-2975; L-16651; NAS 1.60:2975) Avail: NTIS HC
A05/MF A01 CSCL 01C

AIRCRAFT CONFIGURATIONS, AIRCRAFT DESIGN, FUSELAGES, MACH NUMBER, NOISE REDUCTION

EVALUATION OF VARIOUS THRUST CALCULATION TECHNIQUES ON AN F404 ENGINE
RONALD J. RAY Apr. 1990 31 p
(NASA-TP-3001; H-1505; NAS 1.60:3001) Avail: NTIS HC
A03/MF A01 CSCL 21E

CALIBRATING, ENGINE TESTS, FLIGHT TESTS, PERFORMANCE PREDICTION, REAL TIME OPERATION, THRUST

N90-26823*# National Aeronautics and Space Administration. Langley Research Center, Hampton, VA.
EVALUATION OF ENERGY ABSORPTION OF NEW CONCEPTS OF AIRCRAFT COMPOSITE SUBFLOOR INTERSECTIONS
LISA E. JONES (PRC Kentron, Inc., Hampton, VA.) and HUEY D. CARDEN Washington Nov. 1989 33 p
(NASA-TP-2951; L-16628; NAS 1.60:2951) Avail: NTIS HC
A03/MF A01 CSCL 01C

AIRCRAFT CONSTRUCTION MATERIALS, CRASHWORTHINESS, FLOORS, LAMINATES, STRUCTURAL ANALYSIS, STRUCTURAL FAILURE, SUBSTRUCTURES

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 AIRPLANE ELECTRONIC DISPLAY FORMAT ALIGNED WITH THE INERTIAL VELOCITY VECTOR
G. G. STEINMETZ Dec. 1986 23 p
(NASA-TP-2648; L-16168; NAS 1.60:2648) Avail: NTIS HC
A03/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
07 AIRCRAFT PROPULSION AND POWER

TERENCE S. ABBOTT Washington Feb. 1990 39 p Original contains color illustrations
(NASA-TP-2960; L-16637; NAS 1.60:2960) Avail: NTIS HC
A03/MF A01 6 functional color pages CSCL 01D
AIRCRAFT INSTRUMENTS, DISPLAY DEVICES, ENGINE MONITORING INSTRUMENTS, FLIGHT INSTRUMENTS

N90-21004*# National Aeronautics and Space Administration.
Langley Research Center, Hampton, VA.
STEREOPISTIQUE AND EFFECTS ON HOVER-IN-TURBULENCE PERFORMANCE IN A SIMULATED ROTORCRAFT
(FA PROJ. 11.1-61102-AH-45)
(NASA-TP-2980; L-16652; NAS 1.60:2980; AVSCOM-TR-90-B-002; AD-A2244844) Avail: NTIS HC A04/MF A01 CSCL 01/4
CUES, DISPLAY DEVICES, FLIGHT SIMULATION, HOVERING, PILOT PERFORMANCE, ROTARY WING AIRCRAFT, TURBULENCE

N90-25800*# National Aeronautics and Space Administration.
Washington, DC.
SPACE TRANSPORTATION AVIONICS TECHNOLOGY SYMPOSIUM, VOLUME 1: EXECUTIVE SUMMARY
Aug. 1990 24 p Symposium held in Williamsburg, VA, 7-9 Nov. 1989
(NASA-CP-3081-VOL-1; NAS 1.55:3081-VOL-1) Avail: NTIS HC A03/MF A01 CSCL 01D
AVIONICS, CONFERENCES, SPACE TRANSPORTATION

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, OH.
DESIGN OF 9.271-PRESSURE-RATIO 5-STAGE CORE COMPRESSOR AND OVERALL PERFORMANCE FOR FIRST 3 STAGES
RONALD J. STEINKE May 1986 35 p
(NASA-TP-2597; E-2589; NAS 1.60:2597) Avail: NTIS HC
A03/MF A01 CSCL 21E
COMPRESSORS, DESIGN ANALYSIS, FLOW DISTRIBUTION, PERFORMANCE TESTS, ROTOR BLADES (TURBOMACHINERY)

N87-20267*# National Aeronautics and Space Administration.
Lewis Research Center, Cleveland, OH.
NASA-CHINESE AERONAUTICAL ESTABLISHMENT (CAE) SYMPOSIUM
1986 230 p Symposium held in Cleveland, Ohio, 23-27 Sep. 1985
(NASA-CP-2433; E-3033; NAS 1.55:2433) Avail: NTIS HC
A11/MF A02 CSCL 21E
COMBUSTION, FLUID DYNAMICS, THERMODYNAMICS

N87-24481*# National Aeronautics and Space Administration.
Lewis Research Center, Cleveland, OH.
LOW-COST FM OSCILLATOR FOR CAPACITANCE TYPE OF BLADE TIP CLEARANCE MEASUREMENT SYSTEM
JOHN P. BARRANGER Jul. 1987 16 p
(NASA-TP-2746; L-16636; NAS 1.60:2746) Avail: NTIS HC
A03/MF A01 CSCL 21E
AIRCRAFT PROPULSION AND POWER

BLADE TIPS, ERROR ANALYSIS, FREQUENCY MODULATION, NONDESTRUCTIVE TESTS, OSCILLATORS, ROTOR BLADES (TURBOMACHINERY)

N88-15785*# National Aeronautics and Space Administration. Lewis Research Center, Cleveland, OH.

AEROPROPELLUSION '87. SESSION 2: AEROPROPELLUSION STRUCTURES RESEARCH
Nov. 1987 52 p Conference held in Cleveland, Ohio, 17-19
Nov. 1987 Submitted for publication
(NASA-CP-10003-SESS-2; E-3798-SESS-2; NAS 1.55:10003-SESS-2) Avail: NTIS HC A04/MF A01 CSCL 21E
CONTROL SYSTEMS DESIGN, DESIGN ANALYSIS, PROPULSION SYSTEM CONFIGURATIONS, STRUCTURAL ANALYSIS.

N88-15790*# National Aeronautics and Space Administration. Lewis Research Center, Cleveland, OH.

AEROPROPELLUSION '87. SESSION 3: INTERNAL FLUID MECHANICS RESEARCH
Nov. 1987 75 p Conference held in Cleveland, Ohio, 17-19
Nov. 1987 Submitted for publication
(NASA-CP-10003-SESS-3; E-3798-SESS-3; NAS 1.55:10003-SESS-3) Avail: NTIS HC A04/MF A01 CSCL 21E
CHEMICAL REACTIONS, DUCTS, FLUID MECHANICS, INLET FLOW, NOZZLES, PREDICTION ANALYSIS TECHNIQUES, PROPULSION, TURBOMACHINERY.

N88-15794*# National Aeronautics and Space Administration. Lewis Research Center, Cleveland, OH.

AEROPROPELLUSION '87. SESSION 4: INSTRUMENTATION AND CONTROLS RESEARCH
Nov. 1987 77 p Conference held in Cleveland, Ohio, 17-19
Nov. 1987 Submitted for publication
(NASA-CP-10003-SESS-4; E-3798-SESS-4; NAS 1.55:10003-SESS-4) Avail: NTIS HC A05/MF A01 CSCL 21E
CONFERENCES, CONTROL SYSTEMS DESIGN, FIBER OPTICS, FLUID MECHANICS, MEASURING INSTRUMENTS, PROPULSION.

N88-15800*# National Aeronautics and Space Administration. Lewis Research Center, Cleveland, OH.

AEROPROPELLUSION '87. SESSION 5: SUBSONIC PROPULSION TECHNOLOGY
Nov. 1987 153 p Conference held in Cleveland, Ohio, 17-19
Nov. 1987 Submitted for publication
(NASA-CP-10003-SESS-5; E-3798-SESS-5; NAS 1.55:10003-SESS-5) Avail: NTIS HC A05/MF A01 CSCL 21E
CONFERENCES, ENGINE DESIGN, FLUID MECHANICS, PROP-FAN TECHNOLOGY, PROPULSION.

N88-15807*# National Aeronautics and Space Administration. Lewis Research Center, Cleveland, OH.

AEROPROPELLUSION '87. SESSION 6: HIGH-SPEED PROPULSION TECHNOLOGY
Nov. 1987 119 p Conference held in Cleveland, Ohio, 17-19
Nov. 1987 Submitted for publication
CONFERENCES, FLUID MECHANICS, HYPERSONIC AIRCRAFT, PROPULSION SYSTEM CONFIGURATIONS, SUPERSONIC AIRCRAFT, SUPERSONIC COMBUSTION RAMJET ENGINES, TRANSPORT AIRCRAFT.

N88-16697*# National Aeronautics and Space Administration. Lewis Research Center, Cleveland, OH.

AEROPROPELLUSION '87. SESSION 1: AEROPROPELLUSION MATERIALS RESEARCH
Nov. 1987 121 p Conference held in Cleveland, Ohio, 17-19
Nov. 1987 Submitted for publication
(NASA-CP-10003-SESS-1; E-3798-SESS-1; NAS 1.55:10003-SESS-1) Avail: NTIS HC A05/MF A01 CSCL 21E
CERAMICS, CREEP PROPERTIES, ENGINE DESIGN, ENGINE PARTS, FATIGUE (MATERIALS), METAL MATRIX COMPOSITES, POLYMER MATRIX COMPOSITES.

N89-12565*# National Aeronautics and Space Administration. Lewis Research Center, Cleveland, OH.

ADVANCED TURBOPROP PROJECT
ROY D. HAGER and DEBORAH VRABEL (Sverdrup Technology, Inc., Cleveland, Ohio.) 1988 130 p Original contains color illustrations
(NASA-SP-495; NAS 1.21:495; LC88-1690) Avail: NTIS HC A07/MF A01 CSCL 21E
At the direction of Congress, a task force headed by NASA was organized in 1975 to identify potential fuel saving concepts for aviation. The result was the Aircraft Energy Efficiency (ACEE) Program implemented in 1976. An important part of the program was the development of advanced turboprop technology for Mach 0.65 to 0.85 applications having the potential fuel saving of 30 to 50 percent relative to existing turbofan engines. A historical perspective is presented of the development and the accomplishments that brought the turboprop to successful flight tests in 1986 and 1987.

N90-21037*# Sverdrup Technology, Inc., Cleveland, OH.

EXHAUST NOZZLES FOR PROPULSION SYSTEMS WITH EMPHASIS ON SUPERSONIC CRUISE AIRCRAFT
LEONARD E. STITT May 1990 107 p
(NAS3-25266)
(NASA-RP-1255; E-4798; NAS 1.61:1235) Avail: NTIS HC A06/MF A01 CSCL 21E
This compendium summarizes the contributions of the NASA-Lewis and its contractors to supersonic exhaust nozzle research from 1963 to 1985. Two major research and technology efforts sponsored this nozzle research work; the U.S. Supersonic Transport (SST) Program and the follow-on Supersonic Cruise Research (SCR) Program. They account for two generations of nozzle technology: the first from 1963 to 1971, and the second from 1971 to 1985. First, the equations used to calculate nozzle thrust are introduced. Then the general types of nozzles are presented, followed by a discussion of those types proposed for supersonic aircraft. Next, the first-generation nozzles designed specifically for the Boeing SST and the second-generation nozzles designed under the SCR program are separately reviewed and then compared. A chapter on throttle-dependent afterbody drag is included, since drag has a major effect on the off-design performance of supersonic nozzles. A chapter on the performance of supersonic dash nozzles follows, since these nozzles have similar design problems. Finally, the nozzle test facilities used at NASA-Lewis during this nozzle research effort are identified and discussed. These facilities include static test stands, a transonic wind tunnel, and a flying testbed aircraft. A concluding section points to the future: a third generation of nozzles designed for a new era of high speed civil transports to produce even greater advances in performance, to meet new noise rules, and to ensure the continuity of over two decades of NASA research.

N90-23403*# National Aeronautics and Space Administration. Lewis Research Center, Cleveland, OH.

EXPERIMENTAL EVALUATION OF A TUNED ELECTROMAGNETIC DAMPER FOR VIBRATION CONTROL OF CRYOGENIC TURBOPUMP ROTORS
ELISEO DIRUSSO and GERALD V. BROWN Washington Jun. 1990 17 p
(NASA-TP-3005; E-5012; NAS 1.60:3005) Avail: NTIS HC A03/MF A01 CSCL 21E CRYOGENIC TEMPERATURE, ELECTROMAGNETISM, ROCKET ENGINES, ROTOR SPEED, ROTORS, SHAFTS (MACHINE ELEMENTS), TURBINE PUMPS, VIBRATION DAMPING

N90-27722*# National Aeronautics and Space Administration. Lewis Research Center, Cleveland, OH.

COMPUTER CODE FOR PREDICTING COOLANT FLOW AND HEAT TRANSFER IN TURBOMACHINERY
08 AIRCRAFT STABILITY AND CONTROL

AIRCRAFT STABILITY AND CONTROL

Includes aircraft handling qualities; piloting; flight controls; and autopilots.

N87-10103*# National Aeronautics and Space Administration. Ames Research Center, Moffett Field, CA.
IN-FLIGHT TOTAL FORCES, MOMENTS AND STATIC AEREOELASTIC CHARACTERISTICS OF AN OBLIQUE-WING RESEARCH AIRPLANE
(NASA-TP-2224; H-1181; NAS 1.60:2224) Avail: NTIS HC A03/MF A01 CSCL 01C
AEREOELASTIC RESEARCH WINGS, AIRCRAFT DESIGN, FLIGHT TESTS, OBLIQUE WINGS, RESEARCH AIRCRAFT, STRUCTURAL DESIGN, WIND TUNNEL TESTS

N87-10870*# National Aeronautics and Space Administration. Langley Research Center, Hampton, VA.
INTERFERENCE EFFECTS OF THRUST REVERSING ON HORIZONTAL TAIL EFFECTIVENESS OF TWIN-ENGINE FIGHTER AIRCRAFT AT MACH NUMBERS FROM 0.15 TO 0.90
(NASA-TP-2350; L-15811; NAS 1.60:2350) Avail: NTIS HC A06/MF A01 CSCL 01C
AERODYNAMIC INTERFERENCE, FIGHTER AIRCRAFT, TAIL ASSEMBLIES, THRUST REVERSAL, WIND TUNNEL TESTS

N87-10871*# National Aeronautics and Space Administration. Ames Research Center, Moffett Field, CA.
FLIGHT-DETERMINED AERODYNAMIC DERIVATIVES OF THE AD-1 OBLIQUE-WING RESEARCH AIRPLANE
(NASA-TP-2222; H-1179; NAS 1.60:2222) Avail: NTIS HC A03/MF A01 CSCL 01C
AERODYNAMIC COEFFICIENTS, OBLIQUE WINGS, RESEARCH AIRCRAFT, VARIABLE SWEEP WINGS

N87-16849*# National Aeronautics and Space Administration. Langley Research Center, Hampton, VA.
PILOTED SIMULATOR STUDY OF ALLOWABLE TIME DELAYS IN LARGE-AIRPLANE RESPONSE
(NASA-TP-2652; L-16149; NAS 1.60:2652) Avail: NTIS HC A04/MF A01 CSCL 01C
AERODYNAMIC COEFFICIENTS, OBLIQUE WINGS, RESEARCH AIRCRAFT, VARIABLE SWEEP WINGS

N87-18570*# National Aeronautics and Space Administration. Ames Research Center, Moffett Field, CA.
FLIGHT CHARACTERISTICS OF THE AD-1 OBLIQUE-WING RESEARCH AIRCRAFT
ALEX G. SIM and ROBERT E. CURRY Mar. 1985 29 p
(NASA-TP-2223; H-1180; NAS 1.60:2223) Avail: NTIS HC A03/MF A01 CSCL 01C
CONTROL SYSTEMS DESIGN, FLIGHT CHARACTERISTICS, FLIGHT SIMULATORS, LOW SPEED, TIME LAG, TRANSPORT AIRCRAFT

08 AIRCRAFT STABILITY AND CONTROL

AERODYNAMIC CONFIGURATIONS, FLIGHT CHARACTERISTICS, LOW SPEED, OBLIQUE WINGS, RESEARCH AIRCRAFT
N87-25331*# National Aeronautics and Space Administration. Lewis Research Center, Cleveland, OH.
ADVANCED DETECTION, ISOLATION AND ACCOMMODATION OF SENSOR FAILURES: REAL-TIME EVALUATION
(NASA-TP-2482; L-16528; NAS 1.60:2482) Avail: NTIS HC A06/MF A01 CSCL 01C
CONTROLABILITY, DELTA WINGS, FLIGHT SIMULATION, LOW SPEED, PILOTS (PERSONNEL), VORTEX FLAPS

N88-14975** National Aeronautics and Space Administration. Langley Research Center, Hampton, VA.
HANDLING QUALITIES OF A WIDE-BODY TRANSPORT AIRPLANE UTILIZING PITCH ACTIVE CONTROL SYSTEMS (PACS) FOR RELAXED STATIC STABILITY APPLICATION
(NASA-TP-2615; E-3812; NAS 1.60:2615) Avail: NTIS HC A03/MF A01 CSCL 01C
AIRCRAFT CONTROL, DESIGN ANALYSIS, INTEGRATORS, PROPULSIVE EFFICIENCY, ROTARY WING AIRCRAFT

N89-12569*# National Aeronautics and Space Administration. Lewis Research Center, Cleveland, OH.
SINGULAR PERTURBATIONS AND TIME SCALES IN THE DESIGN OF DIGITAL FLIGHT CONTROL SYSTEMS
DESININI S. NAIDU (Old Dominion Univ., Norfolk, Va.) and DOUGLAS B. PRICE Washington, D.C. Dec. 1988 30 p
(NASA-TP-2844; L-16440; NAS 1.60:2844) Avail: NTIS HC A03/MF A01 CSCL 01C
DIGITAL SYSTEMS, FLIGHT CONTROL, OPTIMAL CONTROL, PERTURBATION THEORY

N89-15123*# National Aeronautics and Space Administration. Langley Research Center, Hampton, VA.
DERIVATION AND DEFINITION OF A LINEAR AIRCRAFT MODEL
ELGENE L. DUKE, ROBERT F. ANTONIEWICZ, and KEITH D. KRAMBEER Aug. 1988 106 p
(NASA-RP-1207; H-1391; NAS 1.61:1207) Avail: NTIS HC A06/MF A01 CSCL 01C
AIRCRAFT STABILITY AND CONTROL
A linear aircraft model for a rigid aircraft of constant mass flying over a flat, nonrotating earth is derived and defined. The derivation makes no assumptions of reference trajectory or vehicle symmetry. The linear system equations are derived and evaluated along a general trajectory and include both aircraft dynamics and observation variables. 

N90-15929*# National Aeronautics and Space Administration. 
Hugh L. Dryden Flight Research Facility, Edwards, CA. 
FLIGHT CONTROL SYSTEMS DEVELOPMENT AND FLIGHT TEST EXPERIENCE WITH THE HIMAT RESEARCH VEHICLES 
ROBERT W. KEMPPEL and MICHAEL R. EARLS 
June 1988 
88 p 
(NASA-TP-2822; H-1426; NAS 1.60:2822) 
Avail: NTIS HC 
A05/MF A01 CSCL 01C 
DIGITAL SYSTEMS, FLIGHT CONTROL, FLIGHT TESTS, HIGHLY MANEUVERABLE AIRCRAFT, REMOTELY PILOTED VEHICLES, RESEARCH AIRCRAFT, SCALE MODELS 

N90-15930*# National Aeronautics and Space Administration. 
Hugh L. Dryden Flight Research Facility, Edwards, CA. 
A PILOTED EVALUATION OF AN OBLIQUE-WING RESEARCH AIRCRAFT MOTION SIMULATION WITH DECOUPLING CONTROL LAWS 
ROBERT W. KEMPPEL, WALTER E. MCEINLL, GLENN B. GILYARD, and TRINDEAL A. MAINE 
Nov. 1988 
52 p 
(NASA-TP-2874; H-1430; NAS 1.60:2874) 
Avail: NTIS HC 
A04/MF A01 CSCL 01C 
DECOUPLING, EVALUATION, FLIGHT SIMULATION, FLIGHT TESTS, OBLIQUE WINGS, PILOT PERFORMANCE 

N90-16845*# National Aeronautics and Space Administration. 
Ames Research Center, Moffett Field, CA. 
MODAL CONTROL OF AN OBLIQUE-WING AIRCRAFT 
JAMES D. PHILLIPS 
Jan. 1989 
49 p 
(NASA-TP-2898; A-88250; NAS 1.60:2898) 
Avail: NTIS HC 
A03/MF A01 CSCL 01C 
FLIGHT CONTROL, MODAL RESPONSE, OBLIQUE WINGS, RESEARCH AIRCRAFT 

N90-19309# National Aeronautics and Space Administration. 
Langley Research Center, Hampton, VA. 
INTEGRATED TOOLS FOR CONTROL-SYSTEM ANALYSIS 
AARON J. OSTROFF, MELISSA S. PROFFITT, and DAVID R. CLARK (Planning Research Corp., Hampton, VA.) 
Washington NASA Mar. 1989 
61 p 
(NASA-TP-2885; L-16482; NAS 1.60:2885) 
Avail: NTIS HC 
A04/MF A01 CSCL 01C 
ACTUATORS, COMPUTER PROGRAMS, CONTROL SYSTEMS DESIGN, CONTROLLERS, LINEAR SYSTEMS, SOFTWARE TOOLS, SYSTEMS ANALYSIS 

N90-23468*# National Aeronautics and Space Administration. 
Langley Research Center, Hampton, VA. 
A CLOSED-FORM TRIM SOLUTION YIELDING MINIMUM TRIM DRAG FOR AIRPLANES WITH MULTIPLE LONGITUDINAL-CONTROL EFFECTORS 
KENNETH H. GOODRICH, STEVEN M. SLIWA, and FREDERICK J. LALLMAN 
Washington NASA May 1989 
30 p 
(NASA-TP-2907; L-16484; NAS 1.60:2907) 
Avail: NTIS HC 
A03/MF A01 CSCL 01C 
AERODYNAMIC BALANCE, AIRCRAFT DESIGN, COMPUTATION, LIFT DEVICES, OPTIMIZATION, REDUNDANCY, THRUST VECTOR CONTROL 

N90-23469*# National Aeronautics and Space Administration. 
Langley Research Center, Hampton, VA. 
SIMULATOR EVALUATION OF A DISPLAY FOR A TAKEOFF PERFORMANCE MONITORING SYSTEM 
DAVID B. MIDDLETON, RAGHAVACHARI SRIVATSAN, and LEE H. PERSON, JR. 
Washington NASA May 1989 
29 p 
(NASA-TP-2908; L-16510; NAS 1.60:2908) 
Avail: NTIS HC 
A03/MF A01 CSCL 01C 
ABORTED MISSIONS, DISPLAY DEVICES, MONITORS, RATINGS, SIMULATORS, TAKEOFF 

N90-24327*# National Aeronautics and Space Administration. 
Flight Research Center, Edwards, CA. 
DEVELOPMENT AND FLIGHT TEST EXPERIENCES WITH A FLIGHT-CRUCIAL DIGITAL CONTROL SYSTEM 
DALE A. MACKALL 
Washington NASA Nov. 1988 
116 p 
(NASA-TP-2857; H-1341; NAS 1.60:2857) 
Avail: NTIS HC 
A06/MF A01 CSCL 01C 
AIRCRAFT PERFORMANCE, CONTROL SYSTEMS DESIGN, DIGITAL SYSTEMS, F-16 AIRCRAFT, FLIGHT CONTROL, SYSTEMS INTEGRATION 

N90-10074*# National Aeronautics and Space Administration. 
Langley Research Center, Hampton, VA. 
ANALYSIS OF FLIGHT DATA FROM A HIGH-INCIDENCE RESEARCH MODEL BY SYSTEM IDENTIFICATION METHODS 
JAMES G. BATTERSON and VLADISLAV KLEIN (Joint Inst. for Advancement of Flight Sciences, Hampton, VA.) 
Washington NASA Nov. 1989 
50 p 
(NASA-TP-2940; L-16571; NAS 1.60:2940) 
Avail: NTIS HC 
A03/MF A01 CSCL 01C 
AERODYNAMIC CONFIGURATIONS, AERODYNAMIC STABILITY, ANGLE OF ATTACK, DYNAMIC CONTROL, FLIGHT CHARACTERISTICS, STABILITY DERIVATIVES 

N90-11757*# National Aeronautics and Space Administration. 
Langley Research Center, Hampton, VA. 
COMPARISON OF FLYING QUALITIES DERIVED FROM IN-FLIGHT AND GROUND-BASED SIMULATORS FOR A JET-TRANSPORT AIRPLANE FOR THE APPROACH AND LANDING PILOT TASKS 
WILLIAM D. GRANTHAM 
32 p 
(NASA-TP-2962; L-16609; NAS 1.60:2962) 
Avail: NTIS HC 
A03/MF A01 CSCL 01C 
FLIGHT CHARACTERISTICS, FLIGHT CONTROL, FLIGHT SIMULATION, JET AIRCRAFT, TRANSPORT AIRCRAFT 

N90-15112*# National Aeronautics and Space Administration. 
Lewis Research Center, Cleveland, OH. 
ADVANCED DETECTION, ISOLATION, AND ACCOMMODATION OF SENSOR FAILURES IN TURBOFAN ENGINES: REAL-TIME MICROCOMPUTER IMPLEMENTATION 
JOHN C. DELAAT and WALTER C. MERRILL 
Washington NASA Feb. 1990 
28 p 
(NASA-TP-2925; E-4391; NAS 1.60:2925) 
Avail: NTIS HC 
A03/MF A01 CSCL 01C 
ALGORITHMS, DIGITAL ELECTRONICS, ELECTRONIC CONTROL, ENGINE TESTS, FEEDBACK CONTROL, TURBOFAN ENGINES 

N90-17639*# National Aeronautics and Space Administration. 
Ames Research Center, Moffett Field, CA. 
LONGITUDINAL STABILITY AND CONTROL CHARACTERISTICS OF THE QUIET SHORT-HAUL RESEARCH AIRCRAFT (QSRA) 
JACK D. STEPHENSON and GORDON H. HARDY 
50 p 
(NASA-TP-2965; A-89133; NAS 1.60:2965) 
Avail: NTIS HC 
A03/MF A01 CSCL 01C 
AIRCRAFT PERFORMANCE, FLIGHT CHARACTERISTICS, FLIGHT TESTS, LONGITUDINAL CONTROL, LONGITUDINAL STABILITY, RESEARCH AIRCRAFT, SHORT HAUL AIRCRAFT 

N90-19239*# National Aeronautics and Space Administration. 
Langley Research Center, Hampton, VA. 
LOW-SPEED WIND-TUNNEL INVESTIGATION OF THE FLIGHT DYNAMIC CHARACTERISTICS OF AN ADVANCED TURBOPROP BUSINESS/COMMUTER AIRCRAFT CONFIGURATION 
PAUL L. COE, JR., STEVEN G. TURNER, and D. BRUCE OWENS 
Washington NASA Apr. 1990 
50 p
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.


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


FLOW VELOCITY, MACH NUMBER, WIND TUNNEL APPARATUS, WIND TUNNEL WALLS

N87-18576*# National Aeronautics and Space Administration. Lewis Research Center, Cleveland, OH. EXPERIMENTAL EVALUATION OF TWO TURNING VANE DESIGNS FOR FAN DRIVE CORNER OF 0.1-SCALE MODEL OF NASA LEWIS RESEARCH CENTER'S PROPOSED ALTITUDE WIND TUNNEL DONALD R. BOLDMAN, ROYCE D. MOORE, and RICKEY J. SHYNE Mar. 1987 148 p (NASA-TP-2686; E-3175; NAS 1.60:2686) Avail: NTIS HC A07/MF A01 CSCL 14B

CORNER FLOW, VANES, WIND TUNNEL APPARATUS, WIND TUNNEL DRIVES

N87-22694*# National Aeronautics and Space Administration. Lewis Research Center, Cleveland, OH. 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-2702; E-3267; NAS 1.60:2702) Avail: NTIS HC A03/MF A01 CSCL 14B

EVACUATING (VACUUM), EVALUATION, PLENUM CHAMBERS, WIND TUNNEL MODELS, WIND TUNNEL TESTS

N87-23662*# National Aeronautics and Space Administration. Lewis Research Center, Cleveland, OH. EXPERIMENTAL EVALUATION OF HONEYCOMB/SCREEN CONFIGURATIONS AND SHORT CONTRACTION SECTION FOR NASA LEWIS RESEARCH CENTER'S ALTITUDE WIND TUNNEL RICHARD R. BURLEY and DOUGLAS E. HARRINGTON May 1987 30 p (NASA-TP-2692; E-3142; NAS 1.60:2692) 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

N88-17666*# National Aeronautics and Space Administration. Lewis Research Center, Cleveland, OH. EXPERIMENTAL EVALUATION OF TURNING VANE DESIGNS FOR HIGH-SPEED AND COUPLED FAN-DRIVE CORNERS OF 0.1-SCALE MODEL OF NASA LEWIS RESEARCH CENTER'S PROPOSED ALTITUDE WIND TUNNEL THOMAS F. GELDER, ROYCE D. MOORE, RICKEY J. SHYNE, and DONALD R. BOLDMAN May 1987 54 p Microfiche available as supplement (NASA-TP-2681; E-3218; NAS 1.60:2681) Avail: NTIS HC A03/MF A01 CSCL 14B

ALTITUDE SIMULATION, CORNER FLOW, COUPLING, GUIDE VANES, HIGH SPEED, WIND TUNNEL APPARATUS, WIND TUNNEL DRIVES
12

ASTRONAUTICS (GENERAL)


N87-29578* National Aeronautics and Space Administration. Langley Research Center, Hampton, VA. TECHNOLOGY FOR LARGE SPACE SYSTEMS: A BIBLIOGRAPHY WITH INDEXES (SUPPLEMENT 17) Oct. 1987 140 p (NASA-SP-7046(17); NAS 1.21:7046(17)) Avail: NTIS HC A07 CSCL 22B This bibliography lists 512 reports, articles, and other documents introduced into the NASA scientific and technical information system between January 1, 1987 and June 30, 1987. 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. Author


N88-27214* National Aeronautics and Space Administration, Washington, DC. TECHNOLOGY FOR LARGE SPACE SYSTEMS: A BIBLIOGRAPHY WITH INDEXES (SUPPLEMENT 18) Jun. 1988 162 p (NASA-SP-7046(18); NAS 1.21:7046(18)) Avail: NTIS HC A08 CSCL 22B This bibliography lists 569 reports, articles, and other documents introduced into the NASA scientific and technical information system between July 1, 1987 and December 31, 1987. 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. Author

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ASTRODYNAMICS

Includes powered and free-flight trajectories; and orbital and launching dynamics.

N88-15820 # National Aeronautics and Space Administration. Marshall Space Flight Center, Huntsville, AL.

A STUDY TO EVALUATE STS HEADS-UP ASCENT TRAJECTORY PERFORMANCE EMPLOYING A MINIMUM-HAMILTONIAN OPTIMIZATION STRATEGY

SUJIT SINHA Feb. 1988 56 p

(AASA-TP-2793; M-580; NAS 1.60:2793) Avail: NTIS HC A04/MF A01 CSCL 22A

ASCENT TRAJECTORIES, EVALUATION, HAMILTONIAN FUNCTIONS, OPTIMIZATION, SPACE TRANSPORTATION SYSTEM

N89-15934 # National Aeronautics and Space Administration. Goddard Space Flight Center, Greenbelt, MD.

FLIGHT MECHANICS/ESTIMATION THEORY SYMPOSIUM 1988


Symposium held in Greenbelt, MD, 10-11 May 1988

(NASA-CP-3011; REPT-88B0224; NAS 1.55:3011) Avail: NTIS HC A04/MF A01 CSCL 22A

ESTIMATES, FLIGHT MECHANICS, ORBITAL MECHANICS, SPACECRAFT PERFORMANCE

N90-13444 # National Aeronautics and Space Administration. Goddard Space Flight Center, Greenbelt, MD.

A TRANSIENT RESPONSE METHOD FOR LINEAR COUPLED SUBSTRUCTURES


(NASA-TP-2926; NAS 1.60:2926) Avail: NTIS HC A03/MF A01 CSCL 22A

DISCRETE FUNCTIONS, LINEAR SYSTEMS, LOADS (FORCES), MATHEMATICAL MODELS, NUMERICAL INTEGRATION, TRANSIENT RESPONSE

15

LAUNCH VEHICLES AND SPACE VEHICLES

Includes boosters; operating problems of launch/space vehicle systems; and reusable vehicles.

N87-12581 # National Aeronautics and Space Administration. Marshall Space Flight Center, Huntsville, AL.

SOLAR ARRAY FLIGHT DYNAMIC EXPERIMENT

R. W. SCHOCK Washington May 1986 27 p

(NASA-TP-2598; NAS 1.60:2598) Avail: NTIS HC A03/MF A01 CSCL 10A

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

N87-18588 # National Aeronautics and Space Administration. Marshall Space Flight Center, Huntsville, AL.

SYSTEM STUDY OF THE CARBON DIOXIDE OBSERVATIONAL PLATFORM SYSTEM (CO-OPS): PROJECT OVERVIEW

J. BRISCOE STEPHENS and WILBUR E. THOMPSON Mar. 1987 35 p

(NASA-TP-2696; NAS 1.60:2696) Avail: NTIS HC A03/MF A01 CSCL 22B

ATMOSPHERIC COMPOSITION, CARBON DIOXIDE, REMOTE SENSING, SPACE PLATFORMS

N87-22702 # National Aeronautics and Space Administration. Marshall Space Flight Center, Huntsville, AL.

STRUCTURAL DYNAMICS AND CONTROL INTERACTION OF FLEXIBLE STRUCTURES

ROBERT S. RYAN, ed. and HAROLD N. SCOFIELD, ed. Apr. 1987 680 p Workshop held in Huntsville, ALa., 22-24 Apr. 1986

(NASA-CP-2467-PT-1; M-554-PT-1; NAS 1.55:2467-PT-1) Avail: NTIS HC A99/MF A04 CSCL 22B

CONTROL SYSTEMS DESIGN, DYNAMIC STRUCTURAL ANALYSIS, FLEXIBLE BODIES, LARGE SPACE STRUCTURES, SPACECRAFT CONTROL

N87-22729 # National Aeronautics and Space Administration. Marshall Space Flight Center, Huntsville, AL.

STRUCTURAL DYNAMICS AND CONTROL INTERACTION OF FLEXIBLE STRUCTURES

ROBERT S. RYAN, ed. and HAROLD N. SCOFIELD, ed. Apr.
15 LAUNCH VEHICLES AND SPACE VEHICLES


CONFERENCES, DESIGN ANALYSIS, DYNAMIC STRUCTURAL ANALYSIS, FLEXIBLE BODIES, JOINTS (JUNCTIONS), LARGE SPACE STRUCTURES, SPACE STATIONS

N88-14112*# National Aeronautics and Space Administration. Marshall Space Flight Center, Huntsville, AL.

HYDROBURST TEST OF A CARBON-CARBON INVOLUTE EXIT CONE
ROY M. SULLIVAN Jan. 1986 33 p (NASA-TP-2556; NAS 1.60:2556) Avail: NTIS HC A03/MF A01 CSCL 20H

BURST TESTS, CARBON-CARBON COMPOSITES, CONES, EXHAUST NOZZLES, HYDRODYNAMICS

N89-18504*# National Aeronautics and Space Administration. Marshall Space Flight Center, Huntsville, AL.

PRACTICES IN ADEQUATE STRUCTURAL DESIGN

FLIGHT SAFETY, MANAGEMENT METHODS, PROJECT MANAGEMENT, REQUIREMENTS, SPACE SHUTTLES, STRESS ANALYSIS, STRUCTURAL DESIGN

N90-14256*# National Aeronautics and Space Administration. Marshall Space Flight Center, Huntsville, AL.

PAYLOAD CREW UTILIZATION FOR SPACELAB MISSIONS

CREW PROCEDURES (INFLIGHT), PAYLOAD INTEGRATION, SCHEDULING, SPACECREWS, TASK COMPLEXITY

N90-19249*# National Aeronautics and Space Administration. Langley Research Center, Hampton, VA.

EARTH SCIENCE GEOSTATIONARY PLATFORM TECHNOLOGY

ANTENNA DESIGN, CONFERENCES, ELECTROMAGNETISM, LARGE SPACE STRUCTURES, METROLOGY, MICROWAVE SENSORS, REMOTE SENSING, SYNCHRONOUS PLATFORMS

16 SPACE TRANSPORTATION

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

N87-12585*# National Aeronautics and Space Administration. Marshall Space Flight Center, Huntsville, AL.

DEVELOPMENT TESTING OF LARGE VOLUME WATER SPRAYS FOR WARM FOG DISPERAL

COALESCING, FOG DISPERAL, SPACE SHUTTLES, SPACECRAFT LAUNCHING, SPRAY NOZZLES, WATER

N88-12520*# National Aeronautics and Space Administration. Lewis Research Center, Cleveland, OH.

SPACECRAFT FIRE SAFETY

ATMOSPHERIC COMPOSITION, COMBUSTION PHYSICS, CONFERENCES, FIRE EXTINGUISHERS, FIRES, FLAMMABILITY, INERT ATMOSPHERE, SPACE STATIONS, SPACECRAFT ENVIRONMENTS

N90-25160*# National Aeronautics and Space Administration, Washington, DC.

SPACE SHUTTLE AVIONICS SYSTEM
JOHN F. HANAWAY (Intermetrics, Inc., Houston, TX.) and ROBERT W. MOOREHEAD 1989 75 p Original contains color illustrations (NAS9-17826) (NASA-SP-504; S-579; NAS 1.21:504; LC-89-600318) Avail: NTIS HC A04/MF A01; also available SOD HC $8.50 as 033-000-01079-6; 5 functional color pages CSCL 22B

The Space Shuttle avionics system, which was conceived in the early 1970's and became operational in the 1980's represents a significant advancement of avionics system technology in the areas of systems and redundancy management, digital data base technology, flight software, flight control integration, digital fly-by-wire technology, crew display interface, and operational concepts. The origins and the evolution of the system are traced; the requirements, the constraints, and other factors which led to the final configuration are outlined; and the functional operation of the system is described. An overall system block diagram is included. Author

N90-26036*# National Aeronautics and Space Administration. Langley Research Center, Hampton, VA.

THE EFFECT OF INTERPLANETARY TRAJECTORY OPTIONS ON A MANNED MARS AEROBRAKE CONFIGURATION

AEROBRAKING, ATMOSPHERIC ENTRY SIMULATION, INTERPLANETARY NAVIGATION, INTERPLANETARY TRAJECTORIES, MANNED MARS MISSIONS, PROPULSION SYSTEM PERFORMANCE, TRAJECTORY OPTIMIZATION

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.


ANTENNAS, CONFERENCES, FLEXIBLE SPACECRAFT, LARGE SPACE STRUCTURES, SPACE STATIONS, SPACECRAFT CONTROL, SPACECRAFT DESIGN, SYSTEMS ENGINEERING, TRUSSES, VIBRATION DAMPING
18 SPACECRAFT DESIGN, TESTING AND PERFORMANCE

N87-24495* # National Aeronautics and Space Administration. Langley Research Center, Hampton, VA.
NASA/DO0 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 A02 CSCL 22B
CONTROL, STABILITY, CONTROL SYSTEMS DESIGN, INTERACTIVE CONTROL, SPACE STATIONS, SPACECRAFT CONTROL, VIBRATION DAMPING

N87-26073* National Aeronautics and Space Administration, Washington, DC.
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 A10 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

N88-10084* # National Aeronautics and Space Administration. Lewis Research Center, Cleveland, OH.
(NASA-CP-2473; E-3558; NAS 1.55:2473) Avail: NTIS HC A11/MF A02 CSCL 22B
CONFERENCES, SPACE STATIONS, SPACECRAFT ELECTRONIC EQUIPMENT, SPACECRAFT PROPULSION, SPACECRAFT TRACKING, SYSTEMS ANALYSIS, TELEMETRY

N89-10829* # National Aeronautics and Space Administration. Goddard Space Flight Center, Greenbelt, MD.
FOURTEENTH SPACE SIMULATION CONFERENCE: TESTING FOR A PERMANENT PRESENCE IN SPACE
(NASA-CP-2446; REPT-86B0561; NAS 1.55:2446) Avail: NTIS HC A19/MF A03 CSCL 22B
CLEANING, CONFERENCES, SIMULATION, SPACE SHUTTLES, SPACE STATIONS, SPACECRAFT CONTAMINATION, SPACECRAFT ENVIRONMENTS, TEST FACILITIES, THERMAL ENVIRONMENTS

N88-10870* # National Aeronautics and Space Administration. Langley Research Center, Hampton, VA.
SPACE CONSTRUCTION
(NASA-CP-2490; L-16378; NAS 1.55:2490) Avail: NTIS HC A14/MF A02 CSCL 22B
CONFERENCES, EXTRAVEHICULAR ACTIVITY, MANAGEMENT PLANNING, MISSION PLANNING, SPACE SHUTTLE PAYLOADS, SPACE STATIONS, SPACE TRANSPORTATION SYSTEM

N88-13392* National Aeronautics and Space Administration, Washington, DC.
SPACE STATION SYSTEMS: A BIBLIOGRAPHY WITH INDEXES
Nov. 1987 245 p (NASA-SP-7056(05); NAS 1.21:7056(05)) Avail: NTIS HC A11 CSCL 22B
This bibliography lists 967 reports, articles, and other documents introduced into the NASA scientific and technical information system between January 1, 1987 and June 30, 1987. 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

N89-14115* # National Aeronautics and Space Administration. Langley Research Center, Hampton, VA.
CONTINUUM MODELING OF LARGE LATTICE STRUCTURES: STATUS AND PROJECTIONS
AHMED K. NOOR and MARTIN M. MIKULAS, JR. Feb. 1988 79 p
(NASA-TP-2767; L-16390; NAS 1.60:2767) Avail: NTIS HC A06/MF A01 CSCL 22B
CONTINUUM MODELING, LATTICES, STRUCTURAL ANALYSIS, TRUSSES

N89-12580* # National Aeronautics and Space Administration. Langley Research Center, Hampton, VA.
LIGHTWEIGHT STRUCTURAL DESIGN OF A BOLTED CASE JOINT FOR THE SPACE SHUTTLE SOLID ROCKET MOTOR
JOHN T. DORSEY, PETER A. STEIN (Coast Guard, Yorktown, Va.), and HAROLD G. BUSH Washington, D.C. Nov. 1988 24 p
(NASA-TP-2851; L-16496; NAS 1.60:2851) Avail: NTIS HC A03/MF A01 CSCL 22B
BOLTED JOINTS, ROCKET ENGINE CASES, SPACE SHUTTLE MAIN ENGINE, STRUCTURAL ANALYSIS

N89-12582* # National Aeronautics and Space Administration. Goddard Space Flight Center, Greenbelt, MD.
FIFTEENTH SPACE SIMULATION CONFERENCE: SUPPORT THE HIGHWAY TO SPACE THROUGH TESTING
(NASA-CP-3015; REPT-88B0253; NAS 1.55:3015) Avail: NTIS HC A21/MF A03 CSCL 22B
COMMUNICATION SATELLITES, CONFERENCES, HEAT TRANSFER, RADIATION DAMAGE, SOLAR SIMULATORS, SPACE ENVIRONMENT SIMULATION, SPACE SIMULATORS, SPACE STATIONS, SPACECRAFT CONTAMINATION, THERMAL CONTROL COATINGS

N89-18522* National Aeronautics and Space Administration. Washington, DC.
SPACE STATION SYSTEMS: A BIBLIOGRAPHY WITH INDEXES (SUPPLEMENT 7)
Dec. 1988 289 p (NASA-SP-7056(07); NAS 1.21:7056(07)) Avail: NTIS HC A13 CSCL 22B
This bibliography lists 1,158 reports, articles, and other documents introduced into the NASA scientific and technical information system between January 1, 1988 and June 30, 1988. Its purpose is to provide helpful information to researchers, designers and managers engaged in Space Station technology development and mission design. Coverage includes documents that define major systems and subsystems related to structures
and dynamic control, electronics and power supplies, propulsion, and payload integration. In addition, orbital construction methods, servicing and support requirements, procedures and operations, and missions for the current and future Space Station are included. Author

**N90-26037** National Aeronautics and Space Administration, Washington, DC.

TECHNOLOGY FOR LARGE SPACE SYSTEMS: A BIBLIOGRAPHY WITH INDEXES (SUPPLEMENT 20)

Jun. 1989 183 p

(NASA-SP-7046(20); NAS 1.21:7046(20)) Avail: NTIS HC A09 CSCL 22B

This bibliography lists 684 reports, articles, and other documents introduced into the NASA Scientific and Technical Information System between July, 1988 and December, 1988. Its purpose is to provide helpful information to the researcher or manager engaged in the development of technologies related to large space systems. Subject areas include mission and program definition, design techniques, structural and thermal analysis, structural dynamics and control systems, electronics, advanced materials, assembly concepts, and propulsion. Author

**N90-21062** National Aeronautics and Space Administration. Langley Research Center, Hampton, VA.

NASA/DOD CONTROLS-STRUCTURES INTERACTION TECHNOLOGY 1989


CONFERENCES, CONTROL SYSTEMS DESIGN, FLEXIBLE BODIES, GROUND TESTS, LARGE SPACE STRUCTURES, MATHEMATICAL MODELS, STRUCTURAL DESIGN, SYSTEMS ENGINEERING

**N90-25171** National Aeronautics and Space Administration, Washington, DC.

SPACE STATION SYSTEMS: A BIBLIOGRAPHY WITH INDEXES (SUPPLEMENT 10)

Jun. 1990 352 p

(NASA-SP-7056(10); NAS 1.21:7056(10)) Avail: NTIS HC A16 CSCL 22B

This bibliography lists 1,422 reports, articles, and other documents introduced into the NASA Scientific and Technical Information System between July 1, 1989 and December 31, 1989. Its purpose is to provide helpful information to researchers, designers and managers engaged in Space Station technology development and mission design. Coverage includes documents that define major systems and subsystems related to structures and structures and dynamics control, electronics and power supplies, propulsion, and payload integration. In addition, orbital construction methods, servicing and support requirements, procedures and operations, and missions for the current and future Space Station are included. Author

**N90-26056** National Aeronautics and Space Administration, Washington, DC.

TECHNOLOGY FOR LARGE SPACE SYSTEMS: A BIBLIOGRAPHY WITH INDEXES (SUPPLEMENT 22)

Jul. 1990 274 p

(NASA-SP-7046(22); NAS 1.21:7046(22)) Avail: NTIS HC A12 CSCL 22B

This bibliography lists 1077 reports, articles, and other documents introduced into the NASA Scientific and Technical Information System between July 1, 1989 and December 31, 1989. Its purpose is to provide helpful information to the researcher or manager engaged in the development of technologies related to large space systems. Subject areas include mission and program definition, design techniques, structural and thermal analysis, structural dynamics and control systems, electronics, advanced materials, assembly concepts, and propulsion. Author

**N90-27738** National Aeronautics and Space Administration. Langley Research Center, Hampton, VA.

THERMAL-DISTORTION ANALYSIS OF AN ANTENNA STRONGBACK FOR GEOSTATIONARY HIGH-FREQUENCY MICROWAVE APPLICATIONS

JEFFREY T. FARMER, DEBORAH M. WAHLS, and ROBERT L. WRIGHT Washington Sep. 1990 22 p

(NASA-TP-3016; L-16739; NAS 1.60:3016) Avail: NTIS HC A03/MF A01 CSCL 22A

ANTENNA DESIGN, GEOSYNCHRONOUS ORBITS, MICROWAVE ANTENNAS, MICROWAVE SOUNING, STRUCTURAL ANALYSIS, SYNCHRONOUS PLATFORMS, THERMAL ENVIRONMENTS

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**SPACECRAFT PROPULSION AND POWER**

Includes main propulsion systems and components, e.g., rocket engines; and spacecraft auxiliary power sources.

**N87-30380** National Aeronautics and Space Administration. Marshall Space Flight Center, Huntsville, AL.

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, OH.

EXPERIMENTAL THRUST PERFORMANCE OF A HIGH-AREA-RATIO ROCKET NOZZLE


(NASA-TP-2720; E-3236-1; NAS 1.60:2720) Avail: NTIS HC A03/MF A01 CSCL 21H

AREA, NOZZLE GEOMETRY, ROCKET NOZZLES, ROCKET THRUST

**N87-22766** National Aeronautics and Space Administration. Lewis Research Center, Cleveland, OH.

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 A02 CSCL 21H

AEROTHERMODYNAMICS, CONFERENCES, DURABILITY, DYNAMIC STRUCTURAL ANALYSIS, FATIGUE (MATERIALS), FRACTURE MECHANICS, SPACE SHUTTLE MAIN ENGINE, SPACECRAFT PROPULSION, STRUCTURAL RELIABILITY

**N87-25423** National Aeronautics and Space Administration. Lewis Research Center, Cleveland, OH.

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)

23 CHEMISTRY AND MATERIALS (GENERAL)


CONFERENCES, EARTH ORBITAL ENVIRONMENTS, MICROMETEOROIDS, OXYGEN ATOMS, RADIATION EFFECTS, SPACE DEBRIS, SPACECRAFT CHARGING, SPACECRAFT CONTAMINATION


EXTRATERRESTRIAL ENVIRONMENTS, MICROMETEOROIDS, OXYGEN ATOMS, RADIATION EFFECTS, THERMAL RADIATION


COMPUTER ASSISTED INSTRUCTION, CONFERENCES, DECISION MAKING, EDUCATION, ELECTROCHEMISTRY, EXPERIMENT DESIGN, FIBER COMPOSITES, MANUFACTURING, NASA PROGRAMS, PLASTICS, PROCESS CONTROL (INDUSTRY), RESEARCH AND DEVELOPMENT, TECHNOLOGIES, THERMAL CONDUCTIVITY


CONFERENCES, DATA BASES, ENVIRONMENT EFFECTS, LIFE (DURABILITY), LONG DURATION EXPOSURE FACILITY, SPACEBORNE EXPERIMENTS, SPACECRAFT CONSTRUCTION MATERIALS

24 COMPOSITE MATERIALS

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


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


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


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. Author


Outgassing data, derived from tests at 398 K (125 C) for 24 hours in vacuum as per ASTM E 595-77, have been compiled for numerous materials for spacecraft use. The data presented are the total mass loss (TML) and the collected volatile condensable materials (CVCM). The various materials are listed by likely usage and alphabetically. Author


COMPRESSIVE STRENGTH, EPOXY RESINS, GRAPHITE-EPOXY COMPOSITES, REINFORCING FIBERS

N88-70029# National Aeronautics and Space Administration. Langley Research Center, Hampton, VA. EFFECTS OF CONTINUOUS AND CYCLIC THERMAL EXPOSURES ON BORON- AND BORSIC-REINFORCED 6061 ALUMINUM COMPOSITES GEORGE C. OLSEN and STEPHEN S. TOMPKINS Nov. 1977 48 p (NASA-TP-1063; L-11722; NAS 1.60:1063) Avail: NTIS ALUMINUM, BORON, BORSIC (TRADENAME), COMPOSITE
MATERIALS, CYCLIC LOADS, METAL MATRIX COMPOSITES, THERMAL CYCLING TESTS

N89-19385"* National Aeronautics and Space Administration. Langley Research Center, Hampton, VA.
THE EFFECTS OF SIMULATED SPACE ENVIRONMENTAL PARAMETERS ON SIX COMMERCIALLY AVAILABLE COMPOSITE MATERIALS
JOAN G. FUNK and GEORGE F. SYKES, JR. Apr. 1989 34 p
(NASA-TP-2906; L-16549; NAS 1.60:2906) Avail: NTIS HC A03/MF A01 CSCL 11D
COMPOSITE MATERIALS, EARTH ORBITAL ENVIRONMENTS, FIBER COMPOSITES, RADIATION EFFECTS, SPACE ENVIRONMENT SIMULATION

N89-27796"* National Aeronautics and Space Administration. Lewis Research Center, Cleveland, OH.
TUNGSTEN FIBER REINFORCED COPPER MATRIX COMPOSITES: A REVIEW
DAVID L. MCDANELS Sep. 1989 24 p (NASA-TP-2924; E-4316; NAS 1.60:2924) Avail: NTIS HC A03/MF A01 CSCL 11D
COPPER, FIBER COMPOSITES, METAL MATRIX COMPOSITES, STRESS-STRAIN RELATIONSHIPS, TUNGSTEN

N90-10179"* National Aeronautics and Space Administration. Langley Research Center, Hampton, VA.
THE INTERLAMINAR FRACTURE TOUGHNESS OF WOVEN CARBON/EPOXY COMPOSITES
JOAN G. FUNK and JERRY W. DEATON Washington Nov. 1989 28 p
(NASA-TP-2950; L-16629; NAS 1.60:2950) Avail: NTIS HC A03/MF A01 CSCL 11D
FABRICS, FRACTURE STRENGTH, GRAPHITE-EPOXY COMPOSITES, WEAVING

N90-16007"* National Aeronautics and Space Administration. Marshall Space Flight Center, Huntsville, AL.
INSTRUMENTED IMPACT AND RESIDUAL TENSIILE STRENGTH TESTING OF EIGHT-PLY CARBON EPOXY SPECIMENS
CARBON FIBERS, EPOXY MATRIX COMPOSITES, IMPACT STRENGTH, IMPACT TESTS

N90-19302"* National Aeronautics and Space Administration. Lewis Research Center, Cleveland, OH.
HEAT TREATMENT STUDY OF THE SIC/TTI-15-3 COMPOSITE SYSTEM Final Report
(NASA-TP-2970; E-4985; NAS 1.60:2970) Avail: NTIS HC A03/MF A01 CSCL 11D
AGING (METALLURGY), FIBER COMPOSITES, OXIDATION, SILICON CARBIDES, TENSILE STRENGTH, TITANATES

N90-25198"* National Aeronautics and Space Administration. Marshall Space Flight Center, Huntsville, AL.
LOW VELOCITY INSTRUMENTED IMPACT TESTING OF FOUR NEW DAMAGE TOLERANT CARBON/EPOXY COMPOSITE SYSTEMS
CARBON FIBERS, DAMAGE ASSESSMENT, EPOXY MATRIX COMPOSITES, IMPACT DAMAGE, IMPACT TESTS, LOW SPEED IMPACTS

N90-26077"* National Aeronautics and Space Administration. Langley Research Center, Hampton, VA.
BUCKLING AND POSTBUCKLING BEHAVIOR OF SQUARE COMPRESSION-LOADED GRAPHITE-EPOXY PLATES WITH CIRCULAR CUTOUTS

25 INORGANIC AND PHYSICAL CHEMISTRY

(NASA-TP-3007; L-16777; NAS 1.60:3007) Avail: NTIS HC A03/MF A01 CSCL 11D
BENDING, BUCKLING, COMPRESSION LOADS, GRAPHITE-EPOXY COMPOSITES, METAL PLATES, OPENINGS, ORTHOTROPIC PLATES

N90-27788"* National Aeronautics and Space Administration. Langley Research Center, Hampton, VA.
A PROTECTION AND DETECTION SURFACE (PADS) FOR DAMAGE TOLERANCE
(NASA-TP-3011; L-16775; NAS 1.60:3011) Avail: NTIS HC A03/MF A01 CSCL 11D
AIRCRAFT STRUCTURES, COMPOSITE STRUCTURES, FAILURE, IMPACT DAMAGE, PROTECTION, TOLERANCES (MECHANICS)

N90-27792"* National Aeronautics and Space Administration. Goddard Space Flight Center, Greenbelt, MD.
AMSAHTS 1990: ADVANCES IN MATERIALS SCIENCE AND APPLICATIONS OF HIGH TEMPERATURE SUPERCONDUCTORS
YURY FLOM, ed. Washington Apr. 1990 137 p Conference held in Greenbelt, MD, 2-6 Apr. 1990
(NASA-CP-10043; REPT-90B00018; NAS 1.55:10043) Avail: NTIS HC A07/MF A02 CSCL 11D
CONFERENCES, HIGH TEMPERATURE SUPERCONDUCTORS, REACTION KINETICS, SURFACE REACTIONS, TECHNOLOGY UTILIZATION, THERMODYNAMIC PROPERTIES

N90-27876"* National Aeronautics and Space Administration. Marshall Space Flight Center, Huntsville, AL.
AN EXAMINATION OF IMPACT DAMAGE IN GLASS-PHENOLIC AND ALUMINUM HONEYCOMB CORE COMPOSITE PANELS
(NASA-TP-3042; NAS 1.60:3042) Avail: NTIS HC A03/MF A01 CSCL 11D
ALUMINUM, GLASS FIBER REINFORCED PLASTICS, GRAPHITE-EPOXY COMPOSITES, HONEYCOMB CORES, IMPACT DAMAGE, PHENOLIC RESINS, SANDWICH STRUCTURES

25 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
R. A. OUTLAW, W. K. PEREGOY, GAR B. HOFLUND (Florida Univ., Gainesville), and GREGORY R. CORALLO Apr. 1987 25 p
(NASA-TP-2668; L-16225; NAS 1.60:2668) Avail: NTIS HC A03/MF A01 CSCL 070
ATOMIC BEAMS, DESORPTION, ELECTRON EMISSION, OXYGEN, SILVER, STIMULATED EMISSION

29
25 INORGANIC AND PHYSICAL CHEMISTRY

N88-15846* # National Aeronautics and Space Administration. Langley Research Center, Hampton, VA.
AN ANALYTICAL STUDY OF THE HYDROGEN-AIR REACTION MECHANISM WITH APPLICATION TO SCRAMJET COMBUSTION
CASIMIR J. JACHIMOWSKI Feb. 1988 18 p
(NASA-TP-2791; L-16372; NAS 1.60:2791) Avail: NTIS HC A03/MF A01 CSCL 07D
CHEMICAL REACTIONS, COMBUSTION, HYDROGEN OXYGEN ENGINES, REACTION KINETICS, SUPERSONIC COMBUSTION RAMJET ENGINES

N88-16830* # National Aeronautics and Space Administration. Langley Research Center, Cleveland, OH.
A RAPID METHOD FOR THE COMPUTATION OF EQUILIBRIUM CHEMICAL COMPOSITION OF AIR TO 15000 K
(NASA-TP-2792; L-16375; NAS 1.60:2792) Avail: NTIS HC A03/MF A01 CSCL 07D
AIR, ATMOSPHERIC COMPOSITION, CHEMICAL COMPOSITION, CHEMICAL EQUILIBRIUM, COMPUTATION, HIGH TEMPERATURE

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, OH.
CONVENTIONALLY CAST AND FORGED COPPER ALLOY FOR HIGH-HEAT-FLUX THRUST CHAMBERS
JOHN M. KAZAROFF and GEORGE A. REPAS Feb. 1987 12 p
(NASA-TP-2694; E-3304; NAS 1.60:2694) Avail: NTIS HC A03/MF A01 CSCL 11F
COMBUSTION CHAMBERS, COPPER ALLOYS, HEAT FLUX, HIGH TEMPERATURE, LININGS, SPACE SHUTTLE MAIN ENGINE

N87-16544* # 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-25N-4ZR-2MO TITANIUM FOIL-GAUGE MATERIALS
LINDA B. BALCKBURN Apr. 1987 27 p
(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

N87-21076* # National Aeronautics and Space Administration. Marshall Space Flight Center, Huntsville, AL.
THE CORROSION MECHANISMS FOR PRIMER COATED 2219-T87 ALUMINUM
MERLIN D. DANFO and WARD W. KNOCKEMUS (Huntingdon Coll., Montgomery, Ala.) Apr. 1987 25 p
(NASA-TP-2715; M-559; NAS 1.60:2715) Avail: NTIS HC A03/MF A01 CSCL 11F
ALUMINUM ALLOYS, CORROSION RESISTANCE, PRIMERS (COATINGS), PROTECTIVE COATINGS

N87-25463* # National Aeronautics and Space Administration. Marshall Space Flight Center, Huntsville, AL.
HYDROGEN TRAPPING AND THE INTERACTION OF HYDROGEN WITH METALS
MERLIN D. DANFO Jul. 1987 36 p
(NASA-TP-2744; NAS 1.60:2744) Avail: NTIS HC A03/MF A01 CSCL 11F
CRYSTAL LATTICES, GAS-METAL INTERACTIONS, HYDROGEN, TRAPPING

N87-27024* # National Aeronautics and Space Administration. Langley Research Center, Hampton, VA.
PERMEATION OF OXYGEN THROUGH HIGH PURITY, LARGE GRAIN SILVER
(NASA-TP-2755; L-16305; NAS 1.60:2755) Avail: NTIS HC A03/MF A01 CSCL 11F
GRAIN BOUNDARIES, OXYGEN, PERMEATING, PURITY, SILVER

N89-10996* # National Aeronautics and Space Administration. Lewis Research Center, Cleveland, OH.
INDENTATION PLASTICITY AND FRACTURE IN SILICON
GEORGE C. RYBICKI and P. PIROUZ (Case Western Reserve Univ., Cleveland, Ohio.) Nov. 1988 30 p
(NASA-TP-2863; E-4184; NAS 1.60:2863) Avail: NTIS HC A03/MF A01 CSCL 11B
CRYSTAL DISLOCATIONS, DOPED CRYSTALS, FRACTURE STRENGTH, HARDNESS, PLASTIC PROPERTIES, SILICON, SINGLE CRYSTALS, TRANSITION TEMPERATURE

N89-17650* # National Aeronautics and Space Administration. Lewis Research Center, Cleveland, OH.
SECONDARY ELECTRON EMISSION CHARACTERISTICS OF UNTREATED AND ION-TEXTURED TITANIUM
ARTHUR N. CURREN, KENNETH A. JENSEN, and GARY A. BLACKFORD (Case Western Reserve Univ., Cleveland, OH.) Mar. 1989 16 p
(NASA-TP-2902; E-4495; NAS 1.60:2902) Avail: NTIS HC A03/MF A01 CSCL 11F
ELECTRON EMISSION, ION PLATING, MACHINING, SECONDARY EMISSION, SURFACE FINISHING, TITANIUM

N89-19406* # National Aeronautics and Space Administration. Marshall Space Flight Center, Huntsville, AL.
AN ELECTROCHEMICAL STUDY OF CORROSION PROTECTION BY PRIMER-TOPCOAT SYSTEMS ON 4130 STEEL WITH AC IMPEDANCE AND DC METHODS
M. J. MENDREK, R. H. HIGGINS, and M. D. DANFORD May 1988 56 p
(NASA-TP-2820; NAS 1.60:2820) Avail: NTIS HC A03/MF A01 CSCL 11F
ALTERNATING CURRENT, DIRECT CURRENT, ELECTROCHEMICAL CORROSION, IMPEDANCE, METAL SURFACES, PRIMERS (COATINGS), PROTECTIVE COATINGS, STAINLESS STEELS

N89-26976* # National Aeronautics and Space Administration. Marshall Space Flight Center, Huntsville, AL.
STRESS CORROSION STUDY OF PH13-8MO STAINLESS STEEL USING THE SLOW STRAIN RATE TECHNIQUE
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
J. J. SINGH and D. M. STOAKLEY Dec. 1986 16 p
(NASA-TP-2639; L-16196; NAS 1.60:2639) Avail: NTIS HC A03/MF A01 CSCL 11G
COBALT, EPOXY RESINS, INVESTIGATION, IONS, MECHANICAL PROPERTIES

N87-18666*# National Aeronautics and Space Administration. Lewis Research Center, Cleveland, OH.
ESTER OXIDATION ON AN ALUMINUM SURFACE USING CHEMILUMINESCENCE
WILLIAM R. JONES, JR., MICHAEL A. MEADOR, and WILFREDO MORALES Jul. 1986 16 p
(NASA-TP-2611; E-2647; NAS 1.60:2611) Avail: NTIS HC A03/MF A01 CSCL 11B

ALUMINUM ALLOYS, CHEMILUMINESCENCE, ESTERS, METAL SURFACES, OXIDATION

N87-20423*# National Aeronautics and Space Administration. Marshall Space Flight Center, Huntsville, AL.
MICROGRAVITY CRYSTALLIZATION OF MACROMOLECULES: AN INTERIM REPORT AND PROPOSAL FOR CONTINUED RESEARCH
BENJAMIN E. GOLDBERG Dec. 1986 26 p
(NASA-TP-2671; NAS 1.60:2671) Avail: NTIS HC A03/MF A01 CSCL 20B
MOLECULES, POLYMER CHEMISTRY, RECRYSTALLIZATION, REDUCED GRAVITY

N88-23872*# National Aeronautics and Space Administration. Lewis Research Center, Cleveland, OH.
STRUCTURAL CERAMICS
(NASA-CP-2427; E-3063; NAS 1.55:2427) Avail: NTIS HC A11/MF A02 CSCL 11B
CERAMICS, CONFERENCES, CORROSION, FRACTURE MECHANICS, NONDESTRUCTIVE TESTS, POLYMER CHEMISTRY, TRIBOLOGY

N89-13642*# National Aeronautics and Space Administration. Lewis Research Center, Cleveland, OH.
THERMAL BARRIER COATINGS: ABSTRACTS AND FIGURES 1985 220 p Workshop held in Cleveland, Ohio, 21-22 May 1985
(NASA-CP-10019; E-4425; NAS 1.55:10019) Avail: NTIS HC A10/MF A02 CSCL 11C
BARRIER LAYERS, CONFERENCES, FAILURE ANALYSIS, GAS TURBINES, LIFE (DURABILITY), MATHEMATICAL MODELS, NONDESTRUCTIVE TESTS, PLASMA SPRAYING, THERMAL CONTROL COATINGS

N89-21103*# National Aeronautics and Space Administration. Lewis Research Center, Cleveland, OH.
DEGRADATION AND CROSSLINKING OF PERFLUOROALKYL POLYETHERS UNDER X-RAY IRRADIATION IN ULTRAHIGH VACUUM
SHIGEYUKI MORI (National Academy of Sciences - National Research Council, Washington, DC) and WILFREDO MORALES Mar. 1989 15 p Prepared in cooperation with Iwate Univ., Morioka (Japan)
(NASA-TP-2910; E-4500; NAS 1.60:2910) Avail: NTIS HC A03/MF A01 CSCL 11B
CROSSLINKING, PHOTOELECTRON SPECTROSCOPY, POLYETHER RESINS, RADIATION EFFECTS

N89-25332*# National Aeronautics and Space Administration. Langley Research Center, Hampton, VA.
ABSORBED DOSE THRESHOLDS AND ABSORBED DOSE RATE LIMITATIONS FOR STUDIES OF ELECTRON RADIATION EFFECTS ON POLYETHERIMIDES
(NASA-TP-2926; L-16565; NAS 1.60:2926) Avail: NTIS HC A03/MF A01 CSCL 11C
ELECTRON RADIATION, POLYETHER RESINS, POLYIMIDE RESINS, RADIATION ABSORPTION, RADIATION DOSAGE, RADIATION EFFECTS

N89-26091*# National Aeronautics and Space Administration. Lewis Research Center, Cleveland, OH.
REACTION OF PERFLUOROALKYLPOLYETHERS (PFPE) WITH 440C STEEL IN VACUUM UNDER SLIDING CONDITIONS AT ROOM TEMPERATURE
SHIGEYUKI MORI (Iwate Univ., Morioka, Japan) and WILFREDO MORALES Jan. 1989 16 p
(NASA-TP-2883; E-4209; NAS 1.60:2883) Avail: NTIS HC A03/MF A01 CSCL 07D
29 MATERIALS PROCESSING

Includes space-based development of products and processes for commercial applications.

N87-21141*# National Aeronautics and Space Administration. Lewis Research Center, Cleveland, OH.
MICROGRAVITY FLUID MANAGEMENT SYMPOSIUM
Apr. 1987 225 p Symposium held in Cleveland, Ohio, 9-10 Sep. 1986
(NASA-CP-2465; E-3386; NAS 1.55:2465) Avail: NTIS HC A10/MF A02 CSCL 22A
AEROSPACE ENVIRONMENTS, CONFERENCES, FLUID MANAGEMENT, WEIGHTLESSNESS

N88-10977*# National Aeronautics and Space Administration. Marshall Space Flight Center, Huntsville, AL.
PREPARATIVE ELECTROPHORESIS FOR SPACE
PERCY H. RHODES and ROBERT S. SNYDER Oct. 1987 15 p
(NASA-TP-2777; NAS 1.60:2777) Avail: NTIS HC A03/MF A01 CSCL 22A
CONVECTIVE FLOW, ELECTROHYDRODYNAMICS, ELECTROKINETICS, ELECTROPHORESIS, TEMPERATURE EFFECTS

N88-10978*# National Aeronautics and Space Administration. Marshall Space Flight Center, Huntsville, AL.
CONTINUOUS FLOW ELECTROPHORESIS SYSTEM EXPERIMENTS ON SHUTTLE FLIGHTS STS-6 AND STS-7
ROBERT S. SNYDER, PERCY H. RHODES, and TERESA Y. MILLER Oct. 1987 17 p
(NASA-TP-2778; NAS 1.60:2778) Avail: NTIS HC A03/MF A01 CSCL 22A
CONVECTIVE FLOW, ELECTRICAL RESISTIVITY, ELECTRODYNAMICS, ELECTROPHORESIS, GRAVITATIONAL EFFECTS

N88-14212*# National Aeronautics and Space Administration. Marshall Space Flight Center, Huntsville, AL.
GROWTH OF SOLID SOLUTION SINGLE CRYSTALS
S. L. LEHOCZKY and F. R. SZOFRAN Dec. 1987 18 p
(NASA-TP-2787; NAS 1.60:2787) Avail: NTIS HC A03/MF A01 CSCL 20B
CRYSTAL GROWTH, MERCURY CADMIUM TELLURIDES, SINGLE CRYSTALS, SOLID SOLUTIONS, THERMOPHYSICAL PROPERTIES

N88-23895*# National Aeronautics and Space Administration, Washington, DC.
NONCONTACT TEMPERATURE MEASUREMENT
(NASA-CP-2503; NAS 1.55:2503) Avail: NTIS HC A19/MF A03 CSCL 12A
CONFERENCES, INFRARED RADIOMETERS, OPTICAL PYROMETERS, RADIATION PYROMETERS, TEMPERATURE MEASUREMENT, TEMPERATURE MEASURING INSTRUMENTS

N89-17682*# National Aeronautics and Space Administration. Lewis Research Center, Cleveland, OH.
MICROGRAVITY COMBUSTION DIAGNOSTICS WORKSHOP
(NASA-CP-10017; E-4213; NAS 1.55:10017) Avail: NTIS HC A03/MF A01 CSCL 22A
COMBUSTION PHYSICS, CONFERENCES, DIAGNOSIS, REDUCED GRAVITY

31 ENGINEERING (GENERAL)

Includes vacuum technology; control engineering; display engineering; cryogenics; and fire prevention.

N87-22870*# National Aeronautics and Space Administration. Marshall Space Flight Center, Huntsville, AL.
MODELING DIGITAL CONTROL SYSTEMS WITH MA-PREFILTERED MEASUREMENTS
MICHAEL E. POLITES Jun. 1987 23 p
(NASA-TP-2732; NAS 1.60:2732) Avail: NTIS HC A03/MF A01 CSCL 13H
CONTROL SYSTEMS DESIGN, DIGITAL FILTERS, DIGITAL SYSTEMS, STATE VECTORS, SYSTEMS ENGINEERING

N87-24585*# National Aeronautics and Space Administration. Marshall Space Flight Center, Huntsville, AL.
A NEW APPROACH TO STATE ESTIMATION IN DETERMINISTIC DIGITAL CONTROL SYSTEMS
MICHAEL E. POLITES Jul. 1987 16 p
(NASA-TP-2745; NAS 1.60:2745) Avail: NTIS HC A03/MF A01 CSCL 09B
CONTROL SYSTEMS DESIGN, DIGITAL SYSTEMS, STATE ESTIMATION

N87-27067*# National Aeronautics and Space Administration. Marshall Space Flight Center, Huntsville, AL.
EXACT STATE RECONSTRUCTION IN DETERMINISTIC DIGITAL CONTROL SYSTEMS
MICHAEL E. POLITES Aug. 1987 19 p
(NASA-TP-2757; NAS 1.60:2757) Avail: NTIS HC A03/MF A01 CSCL 13H
DIGITAL COMMAND SYSTEMS, STATE ESTIMATION, STATE VECTORS

N88-17869*# National Aeronautics and Space Administration. Marshall Space Flight Center, Huntsville, AL.
A GENERALIZED METHOD FOR AUTOMATIC DOWNHAND AND WIREFEED CONTROL OF A WELDING ROBOT AND POSITIONER
KEN FERNANDEZ and GEORGE E. COOK (Vanderbilt Univ., Nashville, Tenn.) Feb. 1988 54 p
(NASA-TP-2807; NAS 1.60:2807) Avail: NTIS HC A04/MF A01 CSCL 13B
ARC WELDING, COMPUTER AIDED DESIGN, COMPUTER AIDED MANUFACTURING, PROGRAM VERIFICATION (COMPUTERS), ROBOT CONTROL, ROBOTICS, ROBOTS

N88-18751*# National Aeronautics and Space Administration. Marshall Space Flight Center, Huntsville, AL.
FURTHER DEVELOPMENTS IN EXACT STATE RECONSTRUCTION IN DETERMINISTIC DIGITAL CONTROL SYSTEMS
MICHAEL E. POLITES Mar. 1988 19 p
(NASA-TP-2812; NAS 1.60:2812) Avail: NTIS HC A04/MF A01 CSCL 13B
CONTROL SYSTEMS DESIGN, DIGITAL SYSTEMS, EQUATIONS OF STATE, RECONSTRUCTION, STATE ESTIMATION
N88-28177#/ National Aeronautics and Space Administration.
Marshall Space Flight Center, Huntsville, AL.
MORE ON EXACT STATE RECONSTRUCTION IN DETERMINISTIC DIGITAL CONTROL SYSTEMS
MICHAEL E. POLITES Sep. 1988 21 p
(NASA-TP-2947; NAS 1.60:2847) Avail: NTIS HC A03/MF A01 CSCL 13B
CONTROL SYSTEMS DESIGN, DIGITAL SYSTEMS, PLANT DESIGN, RECONSTRUCTION, STATE ESTIMATION
N89-24507#/ National Aeronautics and Space Administration.
Marshall Space Flight Center, Huntsville, AL.
FURTHER DEVELOPMENTS IN MODELING DIGITAL CONTROL SYSTEMS WITH MA-PREFILTERED MEASUREMENTS
MICHAEL E. POLITES Washington Mar. 1989 20 p
(NASA-TP-2909; M-612; NAS 1.60:2909) Avail: NTIS HC A03/MF A01 CSCL 13B
ACCELEROMETERS, CONTROL SYSTEMS DESIGN, DIGITAL FILTERS, DIGITAL SYSTEMS, GYROSCOPES, STAR TRACKERS
N90-27039#/ National Aeronautics and Space Administration.
Marshall Space Flight Center, Huntsville, AL.
A NEW STATE RECONSTRUCTOR FOR DIGITAL CONTROLS SYSTEMS USING WEIGHTED-AVERAGE MEASUREMENTS
MICHAEL E. POLITES Washington Aug. 1989 17 p
(NASA-TP-2936; M-615; NAS 1.60:2936) Avail: NTIS HC A03/MF A01 CSCL 09B
CONTROL SYSTEMS DESIGN, DIGITAL TECHNIQUES, RECONSTRUCTION, STATE ESTIMATION
N90-16968#/ National Aeronautics and Space Administration.
Langley Research Center, Hampton, VA.
AN AUGER ELECTRON SPECTROSCOPY STUDY OF SURFACE-PREPARATION CONTAMINANTS
(NASA-TP-2972; L-16553; NAS 1.60:2972) Avail: NTIS HC A03/MF A01 CSCL 13B
AUGER SPECTROSCOPY, CLEANING, CONTAMINANTS, ELECTRON SPECTROSCOPY, ELECTROPOLISHING, SURFACE FINISHING
N90-21210#/ National Aeronautics and Space Administration.
Lewis Research Center, Cleveland, OH.
INFLUENCE OF THE DEPOSITION CONDITIONS ON RADIOFREQUENCY MAGNETRON SPUTTERED MOS2 FILMS
PIERRE A. STEINMANN and TALIVALDIS SPALVINS Apr. 1990 11 p
(NASA-TP-2994; E-5181; NAS 1.60:2994) Avail: NTIS HC A03/MF A01 CSCL 13B
DEPOSITION, LUBRICANTS, MAGNETRON SPUTTERING, MORPHOLOGY, RADIO FREQUENCIES, STOICHIOMETRY, THIN FILMS
N90-21219#/ National Aeronautics and Space Administration.
Marshall Space Flight Center, Huntsville, AL.
A GENERAL-PURPOSE BALLOON-BORNE POINTING SYSTEM FOR SOLAR SCIENTIFIC INSTRUMENTS
M. E. POLITES Washington May 1990 22 p
(NASA-TP-3013; NAS 1.60:3013) Avail: NTIS HC A03/MF A01 CSCL 13B
BALLOON-BORNE INSTRUMENTS, CONTROL SYSTEMS DESIGN, POINTING CONTROL SYSTEMS, SOLAR INSTRUMENTS, THREE AXIS STABILIZATION
N90-25255#/ National Aeronautics and Space Administration.
Marshall Space Flight Center, Huntsville, AL.
ROTATING-UNBALANCED-MASS DEVICES FOR SCANNING BALLOON-BORNE EXPERIMENTS, FREE-FLYING SPACECRAFT, AND SPACE SHUTTLE/SPACE STATION EXPERIMENTS
MICHAEL E. POLITES Jun. 1990 17 p
(NASA-TP-3030; NAS 1.60:3030) Avail: NTIS HC A03/MF A01 CSCL 14B
POINTING CONTROL SYSTEMS, ROTATING BODIES, SPACE SHUTTLES, SPACE STATION PAYLOADS, SPACE STATIONS, SPACEBORNE EXPERIMENTS
N90-28754#/ National Aeronautics and Space Administration.
Lewis Research Center, Cleveland, OH.
DEVELOPMENT AND APPROACH TO LOW-FREQUENCY MICROGRAVITY ISOLATION SYSTEMS
CARLOS M. GRODSINSKY Washington Aug. 1990 24 p
(NASATP-2984; E-5287; NAS 1.60:2984) Avail: NTIS HC A03/MF A01 CSCL 22A
GRAVITATIONAL EFFECTS, PAYLOADS, REDUCED GRAVITY, SPACE SHUTTLES, SPACE STATIONS, SPACEBORNE EXPERIMENTS, VIBRATION ISOLATORS

32 COMMUNICATIONS AND RADAR

Includes radar; land and global communications; communications theory; and optical communications.

N87-11918#/ National Aeronautics and Space Administration.
Wallops Flight Center, Wallops Island, VA.
PULSE CODE MODULATION (PCM) ENCODER HANDBOOK FOR AYDIN VECTOR MMP-600 SERIES SYSTEM
(NASA-RP-1171; NAS 1.61:1171) Avail: NTIS HC A07/MF A01 CSCL 17B
PULSE CODE MODULATION (PCM) DATA STORAGE AND ANALYSIS USING A MICROCOMPUTER
D. E. MASSEY Aug. 1986 8 p
(NASA-TP-2629; REPT-822.3; NAS 1.60:2629) Avail: NTIS HC A02/MF A01 CSCL 17B
DATA PROCESSING, DATA REDUCTION, DATA STORAGE, MICROCOMPUTERS, PULSE CODE MODULATION

N87-12718#/ National Aeronautics and Space Administration.
Wallops Flight Center, Wallops Island, VA.
PULSE CODE MODULATION (PCM) DATA STORAGE AND ANALYSIS USING A MICROCOMPUTER
D. E. MASSEY Aug. 1986 8 p
(NASA-TP-2629; REPT-822.3; NAS 1.60:2629) Avail: NTIS HC A02/MF A01 CSCL 17B
DATA PROCESSING, DATA REDUCTION, DATA STORAGE, MICROCOMPUTERS, PULSE CODE MODULATION

N87-17971#/ National Aeronautics and Space Administration.
Lewis Research Center, Cleveland, OH.
BIT-ERROR-RATE TESTING OF HIGH-POWER 30-GHZ TRAVELING WAVE TUBES FOR GROUND-TERMINAL APPLICATIONS
KURT A. SHALKHAUSER and GENE FUJIKAWA Oct. 1986 16 p
(NASA-TP-2635; E-2996; NAS 1.60:2635) Avail: NTIS HC A03/MF A01 CSCL 17B
BIT ERROR RATE, PERFORMANCE TESTS, TRANSMISSION EFFICIENCY, TRAVELING WAVE TUBES

N87-20448#/ National Aeronautics and Space Administration.
Lewis Research Center, Cleveland, OH.
UNIQUE BIT-ERROR-RATE MEASUREMENT SYSTEM FOR SATELLITE COMMUNICATION SYSTEMS
COMMUNICATIONS AND RADAR

MARY JO WINDMILLER Mar. 1987 13 p
(NASA-TP-2699; E-3522; NAS 1.60:2699) Avail: NTIS HC
A03/MF A01 CSCL 17B

BIT ERROR RATE, COMMUNICATION NETWORKS, SATELLITE COMMUNICATION, SYSTEMS ANALYSIS

N87-24590*# National Aeronautics and Space Administration. Wallops Flight Center, Wallops Island, VA.
A SYNCHRONOUS DATA ANALYZER FOR THE MINIMUM DELAY DATA FORMAT (MDDF) AND LAUNCH TRAJECTORY ACQUISITION SYSTEM (LTAS)
A02/MF A01 CSCL 17B

DATA REDUCTION, LAUNCHING, SAMPLING, SYNCHRONISM, TRAJECTORY ANALYSIS

PROPAGATION EFFECTS ON SATELLITE SYSTEMS AT FREQUENCIES BELOW 10 GHZ: A HANDBOOK FOR SATELLITE SYSTEM DESIGN
WARREN L. FLOCK Dec. 1987 501 p (NAS7-100; JPL-956249)
(NASA-RP-1108/2; NAS 1.61:1108/2) Avail: NTIS HC
A22/MF A03 CSCL 22D

Frequencies below 10 GHz continue to be used for a large portion of satellite service, and new applications, including mobile satellite service and the global positioning system, use frequencies below 10 GHz. As frequency decreases below 10 GHz, attenuation due to precipitation and gases decreases and ionospheric effects increase. Thus the ionosphere, which can be largely neglected above 10 GHz, receives major attention. Although attenuation and depolarization due to rain are less severe below 10 GHz than above, they are nevertheless still important and constitute another major topic. The handbook emphasizes the propagation effects on satellite communications but material that is pertinent to radio navigation and positioning systems and deep-space telecommunications is included as well. Chapter 1 through 7 describe the various propagation impairments, and Chapter 9 is devoted to the estimation or calculation of the magnitudes of these effects for use in system design. Chapter 10 covers link power budget equations and the role of propagation effects in these equations. Chapter 8 deals with the complex subject of interference between space and terrestrial systems.

N89-17069*# Westinghouse Electric Corp., Baltimore, MD.
PROPAGATION EFFECTS HANDBOOK FOR SATELLITE SYSTEMS DESIGN. A SUMMARY OF PROPAGATION IMPAIRMENTS ON 10 TO 100 GHZ SATELLITE LINKS WITH TECHNIQUES FOR SYSTEM DESIGN
LOUIS J. IPPOLITO Washington, DC Feb. 1989 531 p (NAS7-100; JPL-956178)
(NASA-RP-1082/04; NAS 1.61:1082/04) Avail: NTIS HC
A23/MF A03 CSCL 20N

The NASA Propagation Effects Handbook for Satellite Systems Design provides a systematic compilation of the major propagation effects experienced on space-Earth paths in the 10 to 100 GHz frequency band region. It provides both a detailed description of the propagation phenomenon and a summary of the impact of the effect on the communications system design and performance. Chapter 2 through 5 describe the propagation effects, prediction models, and available experimental data bases. In Chapter 6, design techniques and prediction methods available for evaluating propagation effects on space-Earth communication systems are presented. Chapter 7 addresses the system design process and how the effects of propagation on system design and performance should be considered and how that can be mitigated. Examples of operational and planned Ku, Ka, and EHF satellite communications systems are given.

N89-17757*# National Aeronautics and Space Administration. Lewis Research Center, Cleveland, OH.
UNIVERSAL TEST FIXTURE FOR MONOLITHIC MM-WAVE INTEGRATED CIRCUITS CALIBRATED WITH AN AUGMENTED TRD ALGORITHM
A03/MF A01 CSCL 09C

ALGORITHMS, CALIBRATING, INTEGRATED CIRCUITS, MICROWAVE CIRCUITS, MILLIMETER WAVES, SOLID STATE DEVICES

N90-11915*# National Aeronautics and Space Administration. Lewis Research Center, Cleveland, OH.
SATELLITE-MATRIX-SWITCHED, TIME-DIVISION-MULTIPLE-ACCESS NETWORK SIMULATOR
A03/MF A01 CSCL 17B

COMMUNICATION NETWORKS, COMMUNICATION SATELLITES, SIMULATORS, TIME DIVISION MULTIPLE ACCESS

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
A19/MF A03 CSCL 10C

CONFERENCES, ENERGY STORAGE, LITHIUM SULFUR BATTERIES, NICKEL CADMIUM BATTERIES, NICKEL HYDROGEN BATTERIES

N87-17990*# National Aeronautics and Space Administration. Lewis Research Center, Cleveland, OH.
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
A03/MF A01 CSCL 09A

ACCUMULATORS, CURRENT DENSITY, ELECTRODES, ELECTRON EMISSION, TRAVELING WAVE TUBES

N87-17991*# National Aeronautics and Space Administration. Lewis Research Center, Cleveland, OH.
CALCULATION OF SECONDARY ELECTRON TRAJECTORIES IN MULTISTAGE DEPRESSED COLLECTORS FOR MICROWAVE AMPLIFIERS
DALE A. FORCE Nov. 1986 7 p (NASA-TP-2664; E-3196; NAS 1.60:2664) Avail: NTIS HC
A02/MF A01 CSCL 09A

ACCUMULATORS, ELECTRON EMISSION, MICROWAVE
34 FLUID MECHANICS AND HEAT TRANSFER

**N89-15337**# National Aeronautics and Space Administration. Lewis Research Center, Cleveland, OH.

**PERFORMANCE OF A MULTISTAGE DEPRESSED COLLECTOR WITH MACHINED TITANIUM ELECTRODES**

PETER RAMINS and BEN T. EBIHARA Jan. 1989 10 p

(NASA-TP-2891; E-4400; NAS 1.60:2891) Avail: NTIS HC A02/MF A01 CSCL 09A

- ACCUMULATORS, ELECTRODES, MACHINING, PERFORMANCE TESTS, TITANIUM

**N89-21169**# National Aeronautics and Space Administration. Lewis Research Center, Cleveland, OH.

**ANALYTICAL AND EXPERIMENTAL PROCEDURES FOR DETERMINING PROPAGATION CHARACTERISTICS OF MILLIMETER-WAVE GALLIUM ARSENIDE MICROSTRIP LINES**

ROBERT R. ROMANOFSKY Mar. 1989 21 p

(NASA-TP-2899; E-4273; NAS 1.60:2899) Avail: NTIS HC A03/MF A01 CSCL 20N

- ELECTROMAGNETIC RADIATION, MICROSTRIP TRANSMISSION LINES, MICROWAVE TRANSMISSION, REFLECTANCE

**N90-27965**# National Aeronautics and Space Administration. Lewis Research Center, Cleveland, OH.

**SPENT-BEAM REFOCUSING ANALYSIS AND MULTISTAGE DEPRESSED COLLECTOR DESIGN FOR A 75-W, 59-TO 64-GHZ COUPLED-CAVITY TRAVELING-WAVE TUBE**

JEFFREY D. WILSON, PETER RAMINS, and DALE A. FORCE Aug. 1990 22 p

(NASA-TP-3039; E-5455; NAS 1.60:3039) Avail: NTIS HC A03/MF A01 CSCL 09A

- ACCUMULATORS, COMPUTER AIDED DESIGN, DESIGN ANALYSIS, TRAVELING WAVE TUBES

34 FLUID MECHANICS AND HEAT TRANSFER

Includes boundary layers; hydrodynamics; fluidics; 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**
New, improved curve fits for the thermodynamic properties of equilibrium air have been developed. The curve fits are for pressure, speed of sound, temperature, entropy, enthalpy, density, and internal energy. The authors report that these curve fits can be readily incorporated into new or existing computational fluid dynamics codes if real gas effects are desired. The curve fits are constructed from Grabau-type equilibrium air and the new curve fits are substantially improved over those of previous curve fits. These improvements are due to the incorporation of a large number of additional terms in the approximating polynomials and careful choices of the transition functions. The ranges of validity of the new curve fits are temperatures up to 25000 K and densities of 10 to 10 to 10 to 10 amagats. Author
34 FLUID MECHANICS AND HEAT TRANSFER

N87-27161*# National Aeronautics and Space Administration. Lewis Research Center, Cleveland, OH.
APPLICATION OF TURBULENCE MODELING TO PREDICT SURFACE HEAT TRANSFER IN STAGNATION FLOW REGION OF CIRCULAR CYLINDER CHI R. WANG and FREDERICK C. YEH Sep. 1987 25 p (NASA-TP-2758; E-3418; NAS 1.60:2758) Avail: NTIS HC A03/MF A01 CSCL 20D
CIRCULAR CYLINDERS, HEAT TRANSFER, MODELS, STAGNATION FLOW, SURFACE PROPERTIES, TURBULENCE

N87-29778*# National Aeronautics and Space Administration. Langley Research Center, Hampton, VA.
DESCRIPTION AND CALIBRATION OF THE LANGLEY HYPERSONIC C4F 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-TP-2384; L-15798; NAS 1.60:2384) Avail: NTIS HC A05/MF A01 CSCL 20D
CALIBRATING, CARBON TETRAFLUORIDE, HYPERSONIC WIND TUNNELS, MACH NUMBER, REAL GASES, TEST FACILITIES

N87-29795*# National Aeronautics and Space Administration. Ames Research Center, Moffett Field, CA.
AERODYNAMIC HEATING, FINITE ELEMENT METHOD, HEAT TRANSFER COEFFICIENTS, REENTRY SHIELDING, SPACE SHUTTLE ORBITERS, THERMAL ANALYSIS

N88-14290*# National Aeronautics and Space Administration. Ames Research Center, Moffett Field, CA.
FLIGHT AND WIND-TUNNEL MEASUREMENTS SHOWING BASE DRAG REDUCTION PROVIDED BY A TRAILING DISK FOR HIGH REYNOLDS NUMBER TURBULENT FLOW FOR SUBSONIC AND TRANSONIC MACH NUMBERS SHERRYL GOECKE POWERS, JARRETT K. HUFFMAN, and CHARLES H. FOX, JR. (National Aeronautics and Space Administration, Langley Research Center, Hampton, Va.) Nov. 1986 143 p (NASA-TP-2638; H-1281; NAS 1.60:2638) Avail: NTIS HC A07/MF A01 CSCL 20D
BASE PRESSURE, DRAG REDUCTION, FLIGHT TESTS, TRAILING EDGE FLAPS, TURBULENT FLOW, WIND TUNNEL TESTS

N88-15924*# National Aeronautics and Space Administration. Lewis Research Center, Cleveland, OH.
CONFERENCES, CRYOGENIC COOLING, CRYOGENIC FLUID STORAGE, CRYOGENIC FLUIDS, CRYOGENIC ROCKET PROPELLANTS, CRYOGENICs, REDUCED GRAVITY

INFLUENCE OF BASE MODIFICATIONS ON IN-FLIGHT BASE DRAG IN THE PRESENCE OF JET EXHAUST FOR MACH NUMBERS FROM 0.7 TO 1.5 SHERRYL GOECKE POWERS Feb. 1988 20 p (NASA-TP-2802; H-1408; NAS 1.60:2802) Avail: NTIS HC A03/MF A01 CSCL 20D
BASE FLOW, DRAG, FLIGHT TESTS, JET EXHAUST, MACH NUMBER, REVISIONS

N88-18884*# National Aeronautics and Space Administration. Ames Research Center, Moffett Field, CA.
GALILEO PROBE PARACHUTE TEST PROGRAM: WAKE PROPERTIES OF THE GALILEO PROBE AT MACH NUMBERS FROM 0.25 TO 0.95 THOMAS N. CANNING (Canning, T. N., Portola Valley, Calif.) and THOMAS M. EDWARDS Apr. 1988 144 p (NAS2-10000)
(GALILEO-TP-1130; A-9643; NAS 1.61:1130) Avail: NTIS HC A07/MF A01 CSCL 20D
The results of surveys of the near and far wake of the Galileo Probe are presented for Mach numbers from 0.25 tp 0.95. The trends in the data resulting from changes in Mach number, radial and axial distance, angle of attack, and a small change in model shape are shown in crossplots based on the data. A rationale for selecting an operating volume suitable for parachute inflation based on low Mach number flight results is outlined. Author

N88-20599*# National Aeronautics and Space Administration. Lewis Research Center, Cleveland, OH.
CONFERENCES, CRYOGENIC FLUIDS, FLUID MANAGEMENT, TECHNOLOGY ASSESSMENT

N88-22325*# National Aeronautics and Space Administration. Langley Research Center, Hampton, VA.
AEROTHERMAL TESTS OF QUILTED DOME MODELS ON A FLAT PLATE AT A MACH NUMBER OF 6.5 CHRISTOPHER E. GLASS and L. ROANE HUNT May 1988 72 p (NASA-TP-2804; L-16346; NAS 1.60:2804) Avail: NTIS HC A04/MF A01 CSCL 20D
AEROTHERMODYNAMICS, HYPERSONIC AIRCRAFT, LAMINAR BOUNDARY LAYER, PRESSURE DISTRIBUTION, THERMAL PROTECTION, TURBULENT BOUNDARY LAYER

N89-11153*# National Aeronautics and Space Administration. Marshall Space Flight Center, Huntsville, AL.
COMBUSTION PHYSICS, CONFERENCES, FLUID DYNAMICS, FUEL COMBUSTION, LAMINAR FLOW, MIXING, MULTIPHASE FLOW, PROPULSION, TURBULENT FLOW

N90-12822*# National Aeronautics and Space Administration. Langley Research Center, Hampton, VA.
AERODYNAMIC PRESSURES AND HEATING RATES ON SURFACES BETWEEN SPLIT ELEVONS AT MACH 6.5 L. ROANE HUNT Washington, D.C. Dec. 1988 85 p (NASA-TP-2855; L-16480; NAS 1.60:2855) Avail: NTIS HC A05/MF A01 CSCL 20D
AERODYNAMIC HEATING, DYNAMIC PRESSURE, ELEVONS, HYPERSONIC FLIGHT, SPLIT FLAPS

37
CONSTITUTIVE RELATIONSHIPS AND MODELS IN COMPUTATION METHODS

A REVIEW OF HIGH-SPEED, CONVECTIVE, HEAT TRANSFER, LIQUID-VAPOR INTERFACES, TWO PHASE FLOW


CONSTITUTIVE EQUATIONS, CONTINUUM MECHANICS, MATHEMATICAL MODELS, MULTIPHASE FLOW

A REVIEW OF REACTION RATES AND THERMODYNAMIC AND TRANSPORT PROPERTIES FOR AN 11-SPECIES AIR MODEL FOR CHEMICAL AND THERMAL NONEQUILIBRIUM CALCULATIONS TO 30000 K


CAPTIVITY EQUATIONS, CONTINUUM MECHANICS, MATHEMATICAL MODELS, MULTIPHASE FLOW

A REVIEW OF THERMAL PROTECTION, TILES

LEWIS RESEARCH CENTER, CLEVELAND, OH. (NASA-RP-1232; L-16664; NAS 1.60:1232) Avail: NTIS HC A03/MF A01 CSCL 20D

AERODYNAMIC PRESSURE AND HEATING-RATE DISTRIBUTIONS IN TILE GAPS AROUND CHINE REGIONS WITH PRESSURE GRADIENTS AT A MACH NUMBER OF 6.6

L. ROANE HUNT and KRISTOPHER K. NOTESTINE (PRC Kentron, Huntsville, AL.) (NASA-CP-3047; REPT-89B00114; NAS 1.55:3047) Avail: NTIS HC A04/MF A01 CSCL 20D

AERODYNAMIC LOADS, HEATING, HIGH PRESSURE, HYPERSONIC SPEED, THERMAL PROTECTION, TILES
environment are provided. Curve fits are given for the various species properties for their efficient computation in flowfield codes. Approximate and more exact formulas are provided for computing the properties of partially ionized air mixtures in a high energy environment. Limitations of the approximate mixing laws are discussed for a mixture of ionized species. An electron number-density correction for the transport properties of the charged species is obtained. This correction has been generally ignored in the literature. 

N90-27065*# National Aeronautics and Space Administration. Langley Research Center, Hampton, VA. 
AN APPROXIMATE METHOD FOR CALCULATING THREE-DIMENSIONAL INVISCID HYPERSONIC FLOW FIELDS CHRISTOPHER J. RILEY and FRED R. DEJARNETTE Washington Aug. 1990 26 p (NASA-TP-3018; L-16745; NAS 1.60:3018) Avail: NTIS HC A03/MF A01 CSCL 20D 
APPROXIMATION, EULER EQUATIONS OF MOTION, FLOW DISTRIBUTION, HYPERSONIC FLOW, INVISCID FLOW, THREE DIMENSIONAL FLOW

N90-28806*# National Aeronautics and Space Administration. Langley Research Center, Hampton, VA. 
GAS-JET AND TANGENT-SLOT FILM COOLING TESTS OF A 12.5 DEG CONE AT MACH NUMBER OF 6.7 ROBERT J. NOWAK May 1988 85 p (NASA-TP-2786; L-16145; NAS 1.60:2786) Avail: NTIS HC A05/MF A01 CSCL 20D 
FILM COOLING, GAS JETS, HEAT TRANSFER, MATHEMATICAL MODELS, PRESSURE MEASUREMENT, SHOCK LAYERS, SLOTS, TEMPERATURE MEASUREMENT

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. Langley Research Center, Hampton, VA. 
CONFERENCES, LASER APPLICATIONS, LASERS, METEOROLOGICAL PARAMETERS, MIDDLE ATMOSPHERE, OPTICAL RADAR, RADAR EQUIPMENT

N87-13731*# National Aeronautics and Space Administration. Lewis Research Center, Cleveland, OH. 
EVALUATION OF DIFFUSE-ILLUMINATION HOLOGRAPHIC CINEMATOGRAPHY IN A FLUTTER CASCADE A. J. DECKER Jul. 1986 33 p (NASA-TP-2593; E-2387; NAS 1.60:2593) Avail: NTIS HC A03/MF A01 CSCL 14E 
CINEMATOGRAPHY, FLOW VISUALIZATION, HOLOGRAPHIC INTERFEROMETRY, HOLOGRAPHY, LASER OUTPUTS, THREE DIMENSIONAL FLOW

N87-20514*# National Aeronautics and Space Administration. Langley Research Center, Hampton, VA. 
A SIMPLIFIED METHOD FOR DETERMINING HEAT OF COMBUSTION OF NATURAL GAS JAG J. SINGH, HOSHANG CHEGINI (Old Dominion Univ., Norfolk, Va.), and GERALD H. MALL (Computer Sciences Corp., Hampton, Va.) Apr. 1987 15 p (NASA-TP-2682; L-16261; NAS 1.60:2682) Avail: NTIS HC A03/MF A01 CSCL 14B 
GAS DETECTORS, HEAT OF COMBUSTION, NATURAL GAS, OXYGEN SUPPLY EQUIPMENT

N88-28286*# National Aeronautics and Space Administration. Lewis Research Center, Cleveland, OH. 
OPTICAL MEASUREMENT OF PROPELLER BLADE DEFLECTIONS ANATOLE P. KURKOV Sep. 1988 31 p (NASA-TP-2841; E-4131; NAS 1.60:2841) Avail: NTIS HC A03/MF A01 CSCL 14B 
DEFLECTION, DISPLACEMENT MEASUREMENT, OPTICAL MEASUREMENT, PROPELLER BLADES

N88-30099*# National Aeronautics and Space Administration. Lewis Research Center, Cleveland, OH. 
HEAT FLUX, SURFACE TEMPERATURE, TEMPERATURE MEASURING INSTRUMENTS, TRANSIENT HEATING

N89-13762*# National Aeronautics and Space Administration. Langley Research Center, Hampton, VA. 
SPATIAL VISION PROCESSES: FROM THE OPTICAL IMAGE TO THE SYMBOLIC STRUCTURES OF CONTOUR INFORMATION DANIEL J. JOBSON Nov. 1988 31 p Original contains color illustrations (NASA-TP-2838; L-16479; NAS 1.60:2838) Avail: NTIS HC A03/MF A01 CSCL 14B 
COMPUTER VISION, CONTOURS, EDGES, IMAGE PROCESSING, SPATIAL FILTERING, SYMBOLS, TEXTURES

N89-15380*# National Aeronautics and Space Administration. Lewis Research Center, Cleveland, OH. 
TECHNIQUE FOR TEMPERATURE COMPENSATION OF EDDY-CURRENT PROXIMITY PROBES ROBERT M. MASTERS Jan. 1989 10 p (NASA-TP-2880; E-4316; NAS 1.60:2880) Avail: NTIS HC A02/MF A01 CSCL 14B 
EDDY CURRENTS, EVALUATION, PERFORMANCE TESTS, PROBES, PROXIMITY, TEMPERATURE COMPENSATION, TEMPERATURE MEASUREMENT, TURBOMACHINERY

N89-16139*# National Aeronautics and Space Administration. Lewis Research Center, Cleveland, OH. 
CRYSTAL GROWTH, RAMAN SPECTRA, RAMAN SPECTROSCOPY, SOLUTIONS

N89-26209*# National Aeronautics and Space Administration. Wallops Flight Center, Wallops Island, VA. 
The Multimode Airborne Radar Altimeter (MARA), a flexible airborne radar remote sensing facility developed by NASA's Goddard Space Flight Center, is discussed. This volume describes the scientific justification for the development of the instrument and the translation of these scientific requirements into instrument
design goals. Values for key instrument parameters are derived to accommodate these goals, and simulations and analytical models are used to estimate the developed system's performance.

Author

N90-10412* # National Aeronautics and Space Administration. Langley Research Center, Hampton, VA.
INTRODUCTION TO TOTAL- AND PARTIAL-PRESSURE MEASUREMENTS IN VACUUM SYSTEMS
R. A. OUTLAW and F. A. KERN Washington Nov. 1989 77 p
(NASA-RP-1218; L:16494; NAS 1.61:1219) Avail: NTIS HC A05/MF A01 CSCL 14B
An introduction to the fundamentals of total and partial pressure measurement in the vacuum regime (760 x 10 to the -16th power Torr) is presented. The instrument most often used in scientific fields requiring vacuum measurement are discussed with special emphasis on ionization type gauges and quadrupole mass spectrometers. Some attention is also given to potential errors in measurement as well as calibration techniques.

Author

N90-16204* # National Aeronautics and Space Administration. Langley Research Center, Hampton, VA.
VISUAL INFORMATION PROCESSING FOR TELEVISION AND TELEROBOTICS
CODING, COMPUTER VISION, CONFERENCES, IMAGE RECONSTRUCTION, IMAGING TECHNIQUES, ROBOTICS, ROBOTS, TELEOPERATORS, TELEROBOTICS, TELEVISION SYSTEMS

Author

N90-17085* # National Aeronautics and Space Administration. Lewis Research Center, Cleveland, OH.
NASA LASER LIGHT SCATTERING ADVANCED TECHNOLOGY DEVELOPMENT WORKSHOP, 1988
FIBER OPTICS, LASER BEAMS, LIGHT SCATTERING, PHOTODIODES, REDUCED GRAVITY, SPECTROSCOPY

Author

N90-21351* # National Aeronautics and Space Administration. Lewis Research Center, Cleveland, OH.
FOUNDATIONS OF MEASUREMENT AND INSTRUMENTATION
ISIDORE WARSHAWSKY Apr. 1990 232 p
(NASA-RP-1222; E:3786; NAS 1.61:1222) Avail: NTIS HC A11/MF A02 CSCL 14B
The user of instrumentation has provided an understanding of the factors that influence instrument performance, selection, and application, and of the methods of interpreting and presenting the results of measurements. Such understanding is prerequisite to the successful attainment of the best compromise among reliability, accuracy, speed, cost, and importance of the measurement operation in achieving the ultimate goal of a project. Some subjects covered are dimensions; units; sources of measurement error; methods of describing and estimating accuracy; deduction and presentation of results through empirical equations, including the method of least squares; experimental and analytical methods of determining the static and dynamic behavior of instrumentation systems, including the use of analogs.

Author

N87-20522* # National Aeronautics and Space Administration. Langley Research Center, Hampton, VA.
CLOSED-CYCLE, FREQUENCY-STABLE CO2 LASER TECHNOLOGY
CARBON DIOXIDE LASERS, CLOSED CYCLES, FREQUENCY STABILITY, RESEARCH MANAGEMENT

Author

N87-27994* # National Aeronautics and Space Administration. Langley Research Center, Hampton, VA.
FREQUENCY DOMAIN LASER VELOCIMETER SIGNAL PROCESSOR: A NEW SIGNAL PROCESSING SCHEME
JAMES F. MEYERS and JAMES I. CLEMMONS, JR. Sep. 1987 38 p
(NASA-TP-2735; L:16209; NAS 1.60:2735) Avail: NTIS HC A03/MF A01 CSCL 20E
DOMAINS, FREQUENCIES, LASER DOPPLER VELOCIMETERS, SIGNAL PROCESSING

Author

N89-17855* # National Aeronautics and Space Administration. Langley Research Center, Hampton, VA.
ANALYSIS OF ND3+:GLASS, SOLAR-PUMPED, HIGH-POWER LASER SYSTEMS
(NASA-TP-2905; L:16085; NAS 1.60:2905) Avail: NTIS HC A03/MF A01 CSCL 20E
GLASS LASERS, HIGH POWER LASERS, NEODYMIUM LASERS, SOLAR COLLECTORS

Author

N90-24585* # National Aeronautics and Space Administration. Langley Research Center, Hampton, VA.
DIODE LASER SATELLITE SYSTEMS FOR BEAMED POWER TRANSMISSION
(NASA-TP-2992; L:16669; NAS 1.60:2992) Avail: NTIS HC A03/MF A01 CSCL 20E
ESTIMATING, LASER POWER BEAMING, OPERATING TEMPERATURE, SATELLITE TRANSMISSION, SEMICONDUCTOR LASERS. STRUCTURAL DESIGN CRITERIA

Author

N90-24586* # National Aeronautics and Space Administration. Langley Research Center, Hampton, VA.
LOW-TEMPERATURE CO-OXIDATION CATALYSTS FOR LONG-LIFE CO2 LASERS
CARBON DIOXIDE LASERS, CATALYSTS, CATALYTIC ACTIVITY, CONFERENCES, LOW TEMPERATURE, OXIDATION
MECHANICAL ENGINEERING

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

N87-10391*# National Aeronautics and Space Administration. Lewis Research Center, Cleveland, OH. TESTING OF UH-60A HELICOPTER TRANSMISSION IN NASA LEWIS 2240-KW (3000-HP) FACILITY A. M. MITCHELL, F. B. OSWALD, and H. H. COE Aug. 1986 30 p (NASA-TP-2626; E-2941; NAS 1.60:2626) Avail: NTIS HC A03/MF A01 CSCL 13/9 HELICOPTERS, TRANSMISSIONS (MACHINE ELEMENTS), VIBRATION MEASUREMENT

N87-18095*# National Aeronautics and Space Administration. Lewis Research Center, Cleveland, OH. 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-2998; NAS 1.60:2610; AD-A170096; AVSCOM-TR-86-C-21) Avail: NTIS HC A03/MF A01 CSCL 13/9 APPLICATIONS PROGRAMS (COMPUTERS), DYNAMIC LOADS, FATIGUE (MATERIALS), GEARS, LIFE (DURABILITY), PITTING


N87-20555*'# National Aeronautics and Space Administration. Lewis Research Center, Cleveland, OH. TRANSMISSION CHARACTERISTICS OF OH-58A HELICOPTER MAIN ROTOR TRANSMISSION DAVID G. LEWICKI and JOHN U. COY Apr. 1987 18 p (NASA-TP-2705; E-3968; NAS 1.60:2705; AVSCOM-TR-86-C-42; AD-A180364) Avail: NTIS HC A03/MF A01 CSCL 01/3 HELICOPTERS, ROTOR AERODYNAMICS, TRANSMISSIONS (MACHINE ELEMENTS), VIBRATION MEASUREMENT


N87-22235*'# National Aeronautics and Space Administration. Lewis Research Center, Cleveland, OH. GEAR TOOTH STRESS MEASUREMENTS ON THE UH-60A HELICOPTER TRANSMISSION FRED B. OSWALD Mar. 1987 17 p (NASA-TP-2698; E-3357; NAS 1.60:2698) Avail: NTIS HC A03/MF A01 CSCL 13/1 GEAR TEETH, STRESS MEASUREMENT, TRANSMISSIONS (MACHINE ELEMENTS), UH-60A HELICOPTER
COMPUTERIZED SIMULATION, HELICOPTER PROPELLER
DRIVE, OPERATING TEMPERATURE, PERFORMANCE TESTS,
ROLLER BEARINGS, THERMAL ANALYSIS, TRANSMISSIONS
(MACHINE ELEMENTS), UH-60A HELICOPTER

N90-18740*# National Aeronautics and Space Administration.
Lewis Research Center, Cleveland, OH.

FASTENER DESIGN MANUAL
RICHARD T. BARRETT Mar. 1990 99 p
Basic mathematical problems on the theory of gearing are
covered in this book, such as the necessary and sufficient
conditions of envelope existence, relations between principal
curvatures and directions for surfaces of mating gears. Also
included are singularities of surfaces accompanied by undercutting
the process of generation, the phenomena of envelope of lines of
contact, and the principles for generation of conjugate surfaces.
Special attention is given to the algorithms for computer aided
simulation of meshing and tooth contact. This edition was
complemented with the results of research recently performed by
the author and his doctoral students. The book contains sample
problems and also problems for the reader to solve. K.C.D.

N90-18745*# National Aeronautics and Space Administration.
Lewis Research Center, Cleveland, OH.

LIQUID LUBRICATION IN SPACE
WHEELS, SHELL THEORY, SPACE SHUTTLE ORBITERS

N90-19593*# Illinois Univ., Chicago. Dept. of Mechanical
Engineering.

THERORY OF GEARING
FAYDOR L. LITVIN 1989 479 p
Prepared in cooperation with Army Aviation System's Command, Cleveland, OH
(NAG3-783; NAG3-655; DA PROJ. 1L1-62209-AH-76)
Basic mathematical problems on the theory of gearing are
covered in this book, such as the necessary and sufficient
conditions of envelope existence, relations between principal
curvatures and directions for surfaces of mating gears. Also
included are singularities of surfaces accompanied by undercutting
the process of generation, the phenomena of envelope of lines of
contact, and the principles for generation of conjugate surfaces.
Special attention is given to the algorithms for computer aided
simulation of meshing and tooth contact. This edition was
complemented with the results of research recently performed by
the author and his doctoral students. The book contains sample
problems and also problems for the reader to solve. K.C.D.

N90-19595*# National Aeronautics and Space Administration.
Langley Research Center, Hampton, VA.

MODELING AND ANALYSIS OF THE SPACE SHUTTLE
NOSE-GEAR TIRE WITH SEMIANALYTIC FINITE ELEMENTS
KYUN O. KIM, AHMED K. NOOR (Joint Inst. for Advancement of
Flight Sciences, Hampton, VA.), and JOHN A. TANNER
Washington Apr. 1990 36 p
The requirement for long-term, reliable operation of aerospace
mechanisms has, with a few exceptions, pushed the state of the
art in tribology. Space mission life requirements in the early 1960s
were generally 6 months to a year. The proposed U.S. space
station schedule to be launched in the 1990s must be continuously
usable for 10 to 20 years. Liquid lubrication systems are generally
used for mission life requirements longer than a year. Although
most spacecraft or satellites have reached their required lifetimes
without a lubrication-related failure, the application of liquid
lubricants in the space environment presents unique challenges.
The state of the art of liquid lubrication in space as well as the
problems and their solutions are reviewed.

37 MECHANICAL ENGINEERING

38 QUALITY ASSURANCE AND RELIABILITY

Includes product sampling procedures and techniques; and quality
control.

N90-27204*# National Aeronautics and Space Administration.
Langley Research Center, Hampton, VA.

ELECTRONICS RELIABILITY AND MEASUREMENT
TECHNOLOGY
JOSEPH S. HEYMAN, ed. Aug. 1987 143 p
Conference held in Hampton, Va., 3-5 Jun. 1986; sponsored by NASA Langley
Research Center, USAF, National Security Industrial Association,
and the Aerospace Industry Association
(NASA-CP-2472; L-16315; NAS 1.55:2472) Avail: NTIS HC
A07/MF A01 CSCL 14D

39 STRUCTURAL MECHANICS

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

N87-28025*# National Aeronautics and Space Administration.
Langley Research Center, Hampton, VA.

A TECHNIQUE FOR EVALUATING THE APPLICATION OF THE
PIN-LEVEL STUCK-AT FAULT MODEL TO VLSI CIRCUITS
DANIEL L. PALUMBO and GEORGE B. FINELLI Sep. 1987
45 p
(NASA-TP-2738; L-16269; NAS 1.60:2738) Avail: NTIS HC
A03/MF A01 CSCL 14D

N81-71592* National Aeronautics and Space Administration.
Lewis Research Center, Cleveland, OH.
THE NASTRAN DEMONSTRATION PROBLEM MANUAL,
LEVEL 17.5
Dec. 1978 185 p refs (NASA-SP-224(05))

N81-71594* National Aeronautics and Space Administration.
Washington, DC.
THE NASTRAN PROGRAMMERS MANUAL, LEVEL 17.5
97.11180# National Aeronautics and Space Administration. Lewis Research Center, Cleveland, OH.
TURBINE ENGINE HOT SECTION TECHNOLOGY, 1984
(NASA-CP-2339; E-2267; NAS 1.55:2339) Avail: NTIS HC
A17/MA03 CSCL 20K
AIRCRAFT ENGINES, AIRFOILS, CONFERENCES, LIFE
(DURABILITY), LININGS, MATHEMATICAL MODELS,
PREDICTION ANALYSIS TECHNIQUES, ROTOR BLADES
(TURBOMACHINE), TURBINE ENGINES

N87-12921# National Aeronautics and Space Administration.
Marshall Space Flight Center, Huntsville, AL.
EFFECTS OF VARIABLES UPON PYROTECHNICALLY
INDUCED SHOCK RESPONSE SPECTRA
J. L. SMITH May 1986 61 p
(NASA-TP-2603; NAS 1.60:2603) Avail: NTIS HC
A05/MA01 CSCL 20K
PYROTECHNICS, SHOCK LOADS, SHOCK SPECTRA,
VARIABILITY

N87-13789# National Aeronautics and Space Administration.
Langley Research Center, Hampton, VA.
EFFECTS OF WINGLET ON TRANSONIC FLUTTER
CHARACTERISTICS OF A CANTILEVERED
TWIN-ENGINE-TRANSPORT WING MODEL
C. L. RUH LIN, K. G. BHATIA (Boeing Commercial Airplane Co.,
Seattle, Wash.), and K. S. NAGARAJA Dec. 1986 77 p
(NASA-TP-2627; L-16095; NAS 1.60:2627) Avail: NTIS HC
A05/MA01 CSCL 20K
AERODYNAMIC CONFIGURATIONS, FLUTTER, PREDICTION
ANALYSIS TECHNIQUES, TRANSONIC FLOW, WIND TUNNEL
TESTS, WINGLETS, WINGS

N87-18321# National Aeronautics and Space Administration.
Lewis Research Center, Cleveland, OH.
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/MA02 CSCL 20K
ACTUATORS, CONFERENCES, FLEXIBLE SPACECRAFT,
HYDRAULIC EQUIPMENT, JOINTS (JUNCTIONS),
MANIPULATORS, SPACE STATIONS, SPACECRAFT
INSTRUMENTS, SPUTTERING, TRIBOLOGY

N87-18855# National Aeronautics and Space Administration.
Langley Research Center, Hampton, VA.
SENSITIVITY ANALYSIS IN ENGINEERING
HOWARD M. ADELMAN, comp. and RAPHAEL T. HAFTKA, comp.
(Virginia Polytechnic Inst. and State Univ., Blacksburg) Feb.
1986
(NASA-CP-2457; L-16278; NAS 1.55:2457) Avail: NTIS HC
A16/MA03 CSCL 20K
DYNAMIC STRUCTURAL ANALYSIS, EIGENVALUES, MODAL
RESPONSE, OPTIMIZATION, SENSITIVITY

N87-20566# National Aeronautics and Space Administration.
Lewis Research Center, Cleveland, OH.
SHOT PEENING FOR Ti-6Al-4V ALLOY COMPRESSOR
BLADES
GERALD A. CAREK Apr. 1987 9 p
(NASA-TP-2711; E-3430; NAS 1.60:2711) Avail: NTIS HC
A02/MA01 CSCL 20K
ALUMINUM, COMPRESSOR BLADES, SHOT PEENING,
TITANIUM ALLOYS, VANADIUM

N87-20567# National Aeronautics and Space Administration.
Langley Research Center, Hampton, VA.
MODELING OF JOINTS FOR THE DYNAMIC ANALYSIS OF
TRUSS STRUCTURES
W. KEITH BELVIN May 1987 43 p
(NASA-TP-2661; L-16163; NAS 1.60:2661) Avail: NTIS HC
A05/MA01 CSCL 20K
DYNAMIC STRUCTURAL ANALYSIS, JOINTS (JUNCTIONS),
LARGE SPACE STRUCTURES, MODELS, TRUSSES

N87-20568# National Aeronautics and Space Administration.
Marshall Space Flight Center, Huntsville, AL.
SPACE STATION STRUCTURES AND DYNAMICS TEST
PROGRAM
CARLETON J. MOORE, JOHN S. TOWNSEND, and EDWARD W.
IVEY Mar. 1987 47 p
(NASA-TP-2710; NAS 1.60:2710) Avail: NTIS HC
A03/MA01 CSCL 20K
DYNAMIC STRUCTURAL ANALYSIS, DYNAMIC TESTS,
LARGE SPACE STRUCTURES, SPACE STATION STRUCTURES,
SPACE STATIONS, SYSTEMS ANALYSIS

N87-27231# Computer Software Management and Information
Center, Athens, GA.
FIFTEENTH NASTRAN (R) USERS' COLLOQUIUM
Aug. 1987 312 p Colloquium held in Kansas City, Mo., 4-6
May 1987
(NASW-3247)

N87-29858# National Aeronautics and Space Administration.
Lyndon B. Johnson Space Center, Houston, TX.
THE 21ST AEROSPACE MECHANISMS SYMPOSIUM
May 1987 356 p Symposium held in Houston, Tex., 29 Apr.
- 1 May 1987; sponsored by NASA, California Inst. of Tech., and
LMSC
(NASA-CP-2470; S-560; NAS 1.55:2470) Avail: NTIS HC
A16/MA02 CSCL 20K
ACTUATORS, DEPLOYMENT, LARGE SPACE STRUCTURES,
MANIPULATORS, ROBOTICS, SPACE ERECTABLE
STRUCTURES

N88-11140# National Aeronautics and Space Administration.
Lewis Research Center, Cleveland, OH.
TURBINE ENGINE HOT SECTION TECHNOLOGY, 1985
Oct. 1985 443 p Conference held in Cleveland, Ohio, 22-23
Oct. 1985
(NASA-CP-2405; E-2727; NAS 1.55:2405) Avail: NTIS HC
A19/MA03 CSCL 20K
COMBUSTION CHAMBERS, CONFERENCES, GAS TURBINE
ENGINES, LININGS, MATHEMATICAL MODELS, METAL
FATIGUE, STRUCTURAL ANALYSIS, TURBINE BLADES, VANES

N88-13609# National Aeronautics and Space Administration.
Marshall Space Flight Center, Huntsville, AL.
THE 58TH SHOCK AND VIBRATION SYMPOSIUM, VOLUME 1
WALTER D. PILKEY, comp. and BARBARA F. PILKEY, comp.
(Virginia Univ., Charlottesville.) Oct. 1987 476 p Symposium
held in Huntsville, Ala., 13-15 Oct. 1987; sponsored in part by
DOD
(NASA-CP-2481; NAS 1.55:2481; AD-A226753) Avail: NTIS HC
A14/MA02 CSCL 20K
COMPUTER AIDED DESIGN, COMPUTER TECHNIQUES,
CONFERENCES, FINITE ELEMENT METHOD, NASTRAN,
STRUCTURAL ANALYSIS, STRUCTURAL VIBRATION

43
JOHN D. WHITCOMB Jul. 1988 26 p
(NOVA-TP-2823; L-16453; NAS 1.60:2823) Avail: NTIS HC
A03/MF A01 CSCL 20K
BUCKLING, DELAMINATING, FINITE ELEMENT METHOD,
LAMINATES, STRAIN ENERGY RELEASE RATE

N88-28343* National Aeronautics and Space Administration.
Marshall Space Flight Center, Huntsville, AL.
SRM (SOLID ROCKET MOTOR) PROPPELLANT AND POLYMER
MATERIALS STRUCTURAL MODELING
CARLETON J. MOORE Aug. 1988 42 p
(NOVA-TP-2824; NAS 1.60:2824) Avail: NTIS HC A03/MF A01
CSCL 20K
POLYMERIC FILMS, PROPPELLANTS, SOLID PROPPELLANT
ROCKET ENGINES, STRUCTURAL ANALYSIS

N89-12876* National Aeronautics and Space Administration.
Lewis Research Center, Cleveland, OH.
TURBINE ENGINE HOT SECTION TECHNOLOGY 1986
Oct. 1986 488 p Workshop held in Cleveland, Ohio, 21-22
Oct. 1986
(NOVA-CP-2444; E-3205; NAS 1.55:2444) Avail: NTIS HC
A21/MF A03 CSCL 20K
CONFERENCES, FATIGUE (MATERIALS), FRACTURE
MECHANICS, GAS TURBINE ENGINES, HEAT TRANSFER,
MEASURING INSTRUMENTS, PROPPELLANT COMBUSTION,
STRUCTURAL ANALYSIS, THERMAL CONTROL COATINGS

N89-12876* National Aeronautics and Space Administration.
Lewis Research Center, Cleveland, OH.
EFFECTS OF VARIABLES UPON PYROTECHNICALLY
INDUCED SHOCK RESPONSE SPECTRA, PART 2
JAMES LEE SMITH Nov. 1988 106 p
(NOVA-TP-2872; NAS 1.60:2872) Avail: NTIS HC A06/MF A01
CSCL 20K
COMPONENT RELIABILITY, JOINTS (JUNCTIONS),
PYROTECHNICS, SHADED CHARGES, SPACECRAFT
STRUCTURES

N89-16170* National Aeronautics and Space Administration.
Langley Research Center, Hampton, VA.
PARTITIONING STRATEGY FOR EFFICIENT NONLINEAR
FINITE ELEMENT DYNAMIC ANALYSIS ON
MULTIPROCESSOR COMPUTERS
AHMED K. NOOR and JEANNE M. PETERS (Joint Inst. for
Advancement of Flight Sciences, Hampton, VA) Washington,
DC. Jan. 1989 38 p Original contains color illustrations
(NAG1-730; AF-AFOSR-0136-88)
INTEGRATIVE STRUCTURAL ANALYSIS, NONLINEAR
STRUCTURAL ANALYSIS, PARTITIONING (COMPUTERS)

N89-16131* National Aeronautics and Space Administration.
Lewis Research Center, Cleveland, OH.
THERMOVISCOPLASTIC MODEL WITH APPLICATION TO
COPPER
ALAN D. FREED Dec. 1988 18 p
(NOVA-TP-2845; E-4280; NAS 1.60:2845) Avail: NTIS HC
A03/MF A01 CSCL 20K
COPPER, MODELS, THERMOVISCOELASTICITY, VISCO-
PLASTICITY

N90-16192* National Aeronautics and Space Administration.
Marshall Space Flight Center, Huntsville, AL.
CYCLIC LOADS TESTS OF CARBON INVOLUTE SOLID
ROCKET MOTOR OUTER BOOT RING SEGMENTS
RAFIQ AHMED Dec. 1988 28 p
(NOVA-TP-2898; M-605; NAS 1.60:2884) Avail: NTIS HC
A03/MF A01 CSCL 20K
CYCLIC LOADS, FIBER COMPOSITES, LOAD TESTS,
MODULUS OF ELASTICITY, PLASTIC PROPERTIES, RESIN

MATRIX COMPOSITES, SPACE SHUTTLE BOOSTERS,
STRESS-STRAIN RELATIONSHIPS

N89-16196* National Aeronautics and Space Administration.
Hugh L. Dryden Flight Research Facility, Edwards, CA.
CONTROL SURFACE SPANWISE PLACEMENT IN ACTIVE
FLUTTER SUPPRESSION SYSTEMS
E. NISSIM and JOHN J. BURKEN Nov. 1988 19 p Prepared
cooperation with Technion - Israel Inst. of Tech., Haifa
(NOVA-TP-2873; H-1492; NAS 1.60:2873) Avail: NTIS HC
A03/MF A01 CSCL 20K
ACTIVE CONTROL, CONTROL SURFACES, FLUTTER
ANALYSIS

N89-17298* National Aeronautics and Space Administration.
Lewis Research Center, Cleveland, OH.
TURBINE ENGINE HOT SECTION TECHNOLOGY, 1987
1987
(NOVA-CP-2493; E-3745; NAS 1.55:2493) Avail: NTIS HC
A20/MF A03 CSCL 20K
AIRCRAFT ENGINES, COMBUSTION, CONFERENCES, FINITE
ELEMENT METHOD, FRACTURE MECHANICS, GAS TURBINE
ENGINES, HEAT TRANSFER, STRUCTURAL ANALYSIS,
THERMAL CONTROL COATINGS, THERMAL FATIGUE, TURBINE
BLADES

N89-17299* National Aeronautics and Space Administration.
Langley Research Center, Hampton, VA.
MEASURED AND PREDICTED ROOT-MEAN-SQUARE ERRORS
IN SQUARE AND TRIANGULAR ANTENNA MESH FACTORS
(NOVA-TP-2896; L-16525; NAS 1.60:2896) Avail: NTIS HC
A03/MF A01 CSCL 20K
ANTENNA DESIGN, ANTENNA RADIATION PATTERNS,
FABRICS, REFLECTORS, ROOT-MEAN-SQUARE ERRORS,
STRUCTURAL ANALYSIS

N90-161979* National Aeronautics and Space Administration.
Washington, DC.
MIXED FINITE ELEMENT MODELS FOR FREE VIBRATIONS
OF THIN-WALLED BEAMS
AHMED K. NOOR, JEANNE M. PETERS, and BYUNG-JIN MIN
Feb. 1989 28 p Prepared in cooperation with Joint Inst. for
Advancement of Flight Sciences, Hampton, VA
(NOVA-TP-2868; L-16476; NAS 1.60:2868) Avail: NTIS HC
A03/MF A01 CSCL 20K
BEAMS (SUPPORTS), FINITE ELEMENT METHOD, FREE
VIBRATION, THIN WALLS

N90-161980* National Aeronautics and Space Administration.
Langley Research Center, Hampton, VA.
MIXED FORMULATION FOR FRICTIONLESS CONTACT
PROBLEMS
AHMED K. NOOR and KYUN O. KIM 1989 26 p Prepared
in cooperation with George Washington Univ., Hampton, VA and Joint
Inst. for Advancement of Flight Sciences, Hampton, VA
(NOVA-TP-2897; L-16513; NAS 1.60:2897) Avail: NTIS HC
A03/MF A01 CSCL 20K
CONTACT LOADS, CURVED BEAMS, DEFORMATION, FINITE
ELEMENT METHOD, FRICTION FACTOR, STRESS ANALYSIS

N91-22940* Computer Software Management and Information
Center, Athens, GA.
SEVENTEENTH NASTRAN (R) USERS' COLLOQUIUM
Mar. 1989 400 p Colloquium held in San Antonio, TX, 24-28
Apr. 1989
(NOVA-CP-3029; NAS 1.55:3029; AD-A226755) Avail: NTIS HC
A06/MF A01 CSCL 20K
CONFERENCES, FINITE ELEMENT METHOD, NASTRAN,
STRAIN ENERGY METHODS, STRUCTURAL ANALYSIS

45
N89-23892**# National Aeronautics and Space Administration. Marshall Space Flight Center, Huntsville, AL.

THE 23RD AEROSPACE MECHANICS SYMPOSIUM

AEROSPACE SYSTEMS, CONFERENCES, DEPLOYMENT, LUBRICANTS, MANIPULATORS, SPACE STATIONS, SPACECRAFT DOCKING, TELEOPERATORS

N89-24626**# National Aeronautics and Space Administration. Langley Research Center, Hampton, VA.

RESEARCH IN STRUCTURES, STRUCTURAL DYNAMICS AND MATERIALS, 1989

ACOUSTIC EMISSION, BUCKLING, COMPOSITE STRUCTURES, CONFERENCES, CONTROL SYSTEMS DESIGN, DISPLACEMENT, DYNAMIC STRUCTURAL ANALYSIS, MATHEMATICAL MODELS

N89-24638**# National Aeronautics and Space Administration. Langley Research Center, Hampton, VA.

COMPUTATIONAL METHODS FOR STRUCTURAL MECHANICS AND DYNAMICS, PART 1

COMPUTATION, COMPUTERIZED SIMULATION, CONFERENCES, SHELLS (STRUCTURAL FORMS), STRESS ANALYSIS, STRUCTURAL ANALYSIS, TIRES

N89-24654**# National Aeronautics and Space Administration. Langley Research Center, Hampton, VA.

COMPUTATIONAL METHODS FOR STRUCTURAL MECHANICS AND DYNAMICS

AEROSPACE DESIGN, COMPUTERIZED SIMULATION, CONFERENCES, DYNAMIC STRUCTURAL ANALYSIS, MANY BODY PROBLEM, STRESS ANALYSIS

N89-26255**# National Aeronautics and Space Administration. Langley Research Center, Hampton, VA.

DERIVATION OF A TAPPERED P-VERSION BEAM FINITE ELEMENT

(NASA-TP-2931; L-16577; NAS 1.60:2931; AVSOM-TR-B-002; AD-A21344) Avail: NTIS HC A03/MF A01 CSCL 20/11

BEAMS, FINITE ELEMENT METHOD, MATHEMATICAL MODELS, TAPERING

N89-27214**# National Aeronautics and Space Administration. Marshall Space Flight Center, Huntsville, AL.

WELD STRESSES BEYOND ELASTIC LIMIT: MATERIALS DISCONTINUITY


ELASTIC PROPERTIES, STRAIN HARDENING, STRESS CONCENTRATION, STRESSES, WELDING

N89-28034**# National Aeronautics and Space Administration. Ames Research Center, Moffett Field, CA.

EVALUATION OF A STRAIN-GAGE LOAD CALIBRATION ON A LOW-ASPECT-RATIO WING STRUCTURE AT ELEVATED TEMPERATURE

AIRCRAFT CONFIGURATIONS, AIRCRAFT STRUCTURES, CALIBRATING, HIGH TEMPERATURE ENVIRONMENTS, LOAD TESTS, LOW ASPECT RATIO WINGS, STRAIN GAGES, WING LOADING

N89-29773**# National Aeronautics and Space Administration. Langley Research Center, Hampton, VA.

NASA WORKSHOP ON COMPUTATIONAL STRUCTURAL MECHANICS 1987, PART 1

ARCHITECTURE (COMPUTERS), CONFERENCES, FINITE ELEMENT METHOD, MULTIPROCESSING (COMPUTERS), PARALLEL PROCESSING (COMPUTERS), SOFTWARE ENGINEERING, STRUCTURAL ANALYSIS

N89-29789**# National Aeronautics and Space Administration. Langley Research Center, Hampton, VA.

NASA WORKSHOP ON COMPUTATIONAL STRUCTURAL MECHANICS 1987, PART 2

ARCHITECTURE (COMPUTERS), COMPUTER AIDED DESIGN, COMPUTER SYSTEMS PROGRAM, COMPUTER SIMULATION, CONFERENCES, FINITE ELEMENT METHOD, STRUCTURAL ANALYSIS, STRUCTURAL ENGINEERING

N89-29799**# National Aeronautics and Space Administration. Langley Research Center, Hampton, VA.

NASA WORKSHOP ON COMPUTATIONAL STRUCTURAL MECHANICS 1987, PART 3

COMPUTER TECHNIQUES, CONFERENCES, FINITE ELEMENT METHOD, LARGE SPACE STRUCTURES, SOFTWARE ENGINEERING, STRUCTURAL ANALYSIS

N89-29811**# National Aeronautics and Space Administration. Langley Research Center, Hampton, VA.

APPLICATION OF NEWTON'S METHOD TO THE POSTBUCKLING OF RINGS UNDER PRESSURE LOADINGS
Buckling, Cylindrical Shells, Deformation, Loads (Forces), Newton Methods, Ring Structures, Structural Failure


Active Control, Aerodynamic Stability, AEROSPACE CONTROL, BALANCE, CONTROL SURFACES, FEEDBACK CONTROL, FLUTTER, INERTIA, MASS DISTRIBUTION

N90-18081*# National Aeronautics and Space Administration. Lewis Research Center, Cleveland, OH. INTEGRATED FORCE METHOD VERSUS DISPLACEMENT METHOD FOR NONLINEAR BUCKLING


Displacement, Equilibrium Equations, Finite Element Method, Loads (Forces), Stiffness, Structural Analysis, Structural Stability

N90-22079*# National Aeronautics and Space Administration. John F. Kennedy Space Center, Cocoa Beach, FL. THE 24TH AEROSPACE MECHANICS SYMPOSIUM


Actuators, Aerospace Engineering, Conferences, Ground Support Equipment, Large Space Structures, Tribology

N90-24637*# Computer Software Management and Information Center, Athens, GA. EIGHTEENTH NASTRAN (R) USERS' COLLOQUIUM


Conferences, Finite Element Method, NASTRAN, Structural Analysis, Structural Vibration

N90-25366*# National Aeronautics and Space Administration. Marshall Space Flight Center, Huntsville, AL. LOADS ANALYSIS AND TESTING OF FLIGHT CONFIGURATION SOLID ROCKET MOTOR OUTER BOOT RING SEGMENTS


Beams (Supports), Bending, Computer Programs, Failure Analysis, Mathematical Models, Solid Propellant Rocket Engines, Stiffness

N90-27121*# National Aeronautics and Space Administration. Langley Research Center, Hampton, VA. MODAL INTERACTION IN POSTBUCKLED PLATES, THEORY


Buckling, Failure Modes, Plates (Structural Members), Structural Analysis, Structural Failure
42 GEOSCIENCES (GENERAL)

REATIONS, SATELLITE SOUNDING, TOTAL OZONE MAPPING SPECTROMETER, TROPOSPHERE

N88-17096*# National Aeronautics and Space Administration. Goddard Space Flight Center, Greenbelt, MD.
NIMBUS 7 SOLAR BACKSCATTER ULTRAVIOLET (SBUV) SPECTRAL SCAN SOLAR IRRADIANCE AND EARTH RADIANCE PRODUCT USER'S GUIDE, BARRY M. SCHLESINGER, RICHARD P. CEBULA, DONALD F. HEATH, AND ALBERT J. FLEIG Feb. 1988 65 p

The archived tape products from the spectral scan mode measurements of solar irradiance (SUNC tapes) and Earth irradiance (EARTH tapes) by the Solar Backscatter UV (SBUV) instrument aboard Nimbus 7 are described. Incoming radiation from 160 to 400 nm is measured at intervals of 0.2 nm. The scan-to-scan repeatability of the solar irradiance measurements ranges from approximately 0.5 to 1 percent around 280 nm, to 2 percent around 210 nm and 0.3 percent near 175 nm. The repeatability of the Earth radiance values ranges from 2 to 3 percent at longer wavelengths and low zenith angles to 10 percent at shorter wavelengths and high zenith angles. The tape formats are described in detail, including file structure and contents of each type of record. Catalogs of the tapes and the time period covered are provided, along with lists of the days lacking solar irradiance measurements and the days dedicated to Earth radiance measurements. The method for production of the tapes is outlined and quality control measures are described. How radiances and irradiances are derived from the raw counts, the corrections for changes in instrument sensitivity, and related uncertainties are discussed.

Author

N89-22152*# National Aeronautics and Space Administration. Goddard Space Flight Center, Greenbelt, MD.

Data sets resulting from the first nine years of operations of the Nimbus-7 Satellite are briefly described. After a brief description of the Nimbus-7 Mission, each of the eight experiments on-board the satellite (Coastal Zone Color Scanner (CZCS), Earth Radiation Budget (ERB), Limb Infrared Monitor of the Stratosphere (MIMS), Stratospheric Aerosol Measurement II (SAM II), Stratospheric and Mesospheric Sounder (SAMS), Solar Backscatter Ultraviolet/Total Ozone Mapping Spectrometer (SBUV/TOMS), Scanning Multichannel Microwave Radiometer (SMMR) and the Temperature Humidity Infrared Radiometer (THIR)) are introduced and their respective data products are described in terms of media, general format, and suggested applications. Extensive references are provided. Instructions for obtaining further information, and for ordering data products are given.

Author

N89-26274*# National Aeronautics and Space Administration. Goddard Space Flight Center, Greenbelt, MD.

Research topics within the NASA Planetary Geosciences Program are presented. Activity in the fields of planetary geology, geophysics, materials, and geochemistry is covered. The investigator's current research efforts, the importance of that work in understanding a particular planetary geoscience problem, the context of that research, and the broader planetary geoscience effort is described. As an example, theoretical modelling of the stability of water ice within the Martian regolith, the applicability of that work to understanding Martian volatiles in general, and the geologic history of Mars is discussed.

Author

N89-26275*# National Aeronautics and Space Administration. Goddard Space Flight Center, Greenbelt, MD.

Electronic data includes the generation of brightness temperature maps for the whole earth at 91 channels in the wavelength range from 1.1 to 21.2 cm. The data are available on computer tape or disk, on magnetic cassette, and via computer network with a time series of daily brightness temperature gridded maps available. Data are given for all ten channels of the Nimbus-7 Scanning Multichannel Microwave Radiometer orbital data. This unique data set can be utilized in a wide range of applications including heat flux, ocean circulation, ice edge productivity, and climate studies. Data generated for the Antarctic region are mapped using the 293 by 293 grid only. The general technique for mapping, and a quality assessment of the data set are presented. Monthly and yearly averages are also generated from the daily data and sample geophysical ice images and products derived from the data are given. Contour plots of monthly ice concentrations derived from the data for October 1978 through August 1987 are presented to demonstrate spatial and temporal detail which this data set can offer, and to show potential research applications.

Author

N90-22824*# National Aeronautics and Space Administration. Goddard Space Flight Center, Greenbelt, MD.

A workshop to address rapid changes in global sea level. Antarctic and Greenland Ice Sheets, and the stability of water ice within the Martian regolith are topics included.

Author

43 EARTH RESOURCES AND REMOTE SENSING

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

N87-22281*# National Aeronautics and Space Administration. Langley Research Center, Hampton, VA.
SURFACE BIDIRECTIONAL REFLECTANCE PROPERTIES OF TWO SOUTHWESTERN ARIZONA DESERTS FOR WAVELENGTHS BETWEEN 0.4 AND 2.2 MICROMETERS CHARLES H. WHITLOCK, G. CARLTON PURGOLD, and STUART R. LECROY (PRC Kentron, Inc., Hampton, Va.) May 1987 49 p

Includes remote sensing of earth resources by aircraft and spacecraft; photogrammetry; and aerial photography.
ALBEDO, BIDIRECTIONAL REFLECTANCE, DESERTS, DIRECTIVITY, SOLAR POSITION, ZENITH

N87-27315* National Aeronautics and Space Administration, Washington, DC.

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

Aug. 1987 164 p (NASA-SP-7041(54); NAS 1.21:7041(54)) Avail: NTIS HC A08 CSCL 05B

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^{-1}


Plots of logarithm (base 10) of absorption line strength versus wavenumber from 0 to 17900/cm(sup)-1 are shown for the 28 atmospheric gases (H2O, CO2, O3, N2O, CO, CH4, O2, NO, SO2, NO2, NH3, HNO3, OH, HF, HCl, HBr, HI, CIO, OCS, H2CO, HOCl, N2, HCN, CH3Cl, HO2, C2H4, C2H2, PH3), which appear in the 1986 Air Force Geophysics Laboratory high-resolution transmission molecular absorption data base (HITRAN) compilation, and for O(P-3), O-18 isotopic oxygen, and HO2 from the 1984 JPL compilation in the 0- to 200/cm(sup)-1 region, and infrared solar CO lines at 4500 K. Also shown are plots of logarithm (base 10) of approximate infrared absorption cross sections of 11 heavy molecules versus wavenumber. The cross-section data cover 700 to 1800/cm(sup)-1 and are included as a separate data file in the 1986 HITRAN database.

Author

N88-20714** National Aeronautics and Space Administration.

GODDARD SPACE FLIGHT CENTER, GREENBELT, MD.

THE 1987 AIRBORNE ANTARCTIC OZONE EXPERIMENT: THE NIMBUS-7 TOMS DATA ATLAS


COHERENT ELECTROMAGNETIC RADIATION, ELECTROMAGNETIC NOISE, LANDSAT 4, LANDSAT 5, MULTISPECTRAL BAND SCANNERS, NOISE REDUCTION

43 EARTH RESOURCES AND REMOTE SENSING

purpose. The TOMS data preparation and method of transfer over the telecommunications links are reviewed. This atlas includes a complete set of the near-real-time TOMS orbital overpass data over regions around the Palmer Peninsula of Antarctica for the period of August 8 through September 29, 1987. Also provided are daily polar orthographic projections of TOMS total ozone measurements over the Southern Hemisphere from August through November 1987. In addition, a chronology of the salient points of the experiment, along with some latitudinal cross sections and time series at locations of interest of the TOMS total ozone observations are presented. The TOMS total ozone measurements are evaluated along the flight tracks of each of the ER-2 and DC-8 missions during the experiment. The ozone hole is shown here to develop in a monotonic progression throughout late August and September. The minimum total ozone amount was found on 5 October, when its all-time lowest value of 109 DU is recorded. The hole remains well defined, but fills gradually from mid-October through mid-November. The hole’s dissolution is observed here to begin in mid-November, when it elongates and begins to rotate. By the end of November, the south pole is no longer located within the ozone hole.

Author
43 EARTH RESOURCES AND REMOTE SENSING

N89-29825* National Aeronautics and Space Administration, Washington, DC.
EARTH RESOURCES: A CONTINUING BIBLIOGRAPHY WITH INDEXES (ISSUE 62)
Nov. 1988 146 p
(NASA-SP-7041(62); NAS 1.21:7041(62)) Avail: NTIS HC A07;
NTIS standing order as PB89-903800, $15.50 domestic, $31.00 foreign
CSCL 08B

This bibliography lists 544 reports, articles, and other documents introduced into the NASA scientific and technical information system between April 1 and June 30, 1989. 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

N90-12091* National Aeronautics and Space Administration, Washington, DC.
EARTH RESOURCES: A CONTINUING BIBLIOGRAPHY WITH INDEXES (ISSUE 63)
Oct. 1989 128 p
(NASA-SP-7041(63); NAS 1.21:7041(63)) Avail: NTIS HC A07;
NTIS standing order as PB89-903800, $15.50 domestic, $31.00 foreign
CSCL 08B

This bibliography lists 449 reports, articles, and other documents introduced into the NASA scientific and technical information system between July 1 and September 31, 1989. 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, oceanography and marine resources, hydrology and water management, data processing and distribution systems, and instrumentation and sensors.

Author

N90-23780* National Aeronautics and Space Administration. Goddard Space Flight Center, Greenbelt, MD.
SENSOR PERFORMANCE ANALYSIS
(NASA-SP-9214; REPT-88B00057; NAS 1.61:1241) Avail: NTIS HC A05/MF A01 CSCL 14B

The theory is described and the equations required to design are developed and the performance of electro-optical sensor systems that operate from the visible through the thermal infrared spectral regions are analyzed. Methods to compute essential optical and detector parameters, signal-to-noise ratio, MTF, and figures of merit such as NE delta rho and NE delta T are developed. A set of atmospheric tables are provided to determine scene radiance in the visible spectral region. The Planck function is used to determine radiance in the infrared. The equations developed were incorporated in a spreadsheet so that a wide variety of sensor studies can be rapidly and efficiently conducted.

Author

N90-27140* National Aeronautics and Space Administration. Langley Research Center, Hampton, VA.
EARTH SCIENCES REQUIREMENTS FOR THE INFORMATION SCIENCES EXPERIMENT SYSTEM
Workshop held in Williamsburg, VA, 1-4 May 1989
(NASA-CP-3072; L-16773; NAS 1.55:3072) Avail: NTIS HC A10/MF A02 CSCL 05B

CONFERENCES, DATA PROCESSING EQUIPMENT, EARTH OBSERVING SYSTEM (EOS), EQUIPMENT SPECIFICATIONS, REAL TIME OPERATION, SUPPORT SYSTEMS

44 ENERGY PRODUCTION AND CONVERSION

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

N87-26413* National Aeronautics and Space Administration. Lewis Research Center, Cleveland, OH.
SPACE PHOTOVOLTAIC RESEARCH AND TECHNOLOGY
1986. HIGH EFFICIENCY, SPACE ENVIRONMENT, AND ARRAY TECHNOLOGY
Jun. 1987 375 p Conference held in Cleveland, Ohio, 7-9 Oct. 1986
(NASA-CP-2475; E-3450; NAS 1.55:2475) Avail: NTIS HC A16/MF A03 CSCL 10B

CONFERENCES, ENERGY CONVERSION EFFICIENCY, PHOTOVOLTAIC CONVERSION, SOLAR CELLS, SPACECRAFT POWER SUPPLIES

N87-29914* National Aeronautics and Space Administration. Lewis Research Center, Cleveland, OH.
SPACE ELECTROCHEMICAL RESEARCH AND TECHNOLOGY (SERT)
Sep. 1987 364 p Conference held in Cleveland, Ohio, 14-16 Apr. 1987
(NASA-CP-2484; E-3506; NAS 1.55:2484) Avail: NTIS HC A16/MF A03 CSCL 10C

ELECTRIC BATTERIES, ELECTROCATALYSTS, ELECTROCHEMISTRY, MATHEMATICAL MODELS, REGENERATIVE FUEL CELLS

N89-22982* National Aeronautics and Space Administration. Lewis Research Center, Cleveland, OH.
SPACE PHOTOVOLTAIC RESEARCH AND TECHNOLOGY CONFERENCE: ABSTRACTS Abstracts Only
Washington 1989 49 p Conference held in Cleveland, OH, 11-13 Apr. 1989
(NASA-CP-10029; E-4708; NAS 1.55:10029) Avail: NTIS HC A03/MF A01 CSCL 10A

PHOTOVOLTAIC CONVERSION, SOLAR CELLS, SPACECRAFT POWER SUPPLIES

N89-24704* National Aeronautics and Space Administration. Lewis Research Center, Cleveland, OH.
SPACE PHOTOVOLTAIC RESEARCH AND TECHNOLOGY, 1988. HIGH EFFICIENCY, SPACE ENVIRONMENT, AND ARRAY TECHNOLOGY
(NASA-CP-3030; E-4587; NAS 1.55:3030) Avail: NTIS HC A16/MF A03 CSCL 10A

CONFERENCES, PHOTOVOLTAIC EFFECT, SOLAR ARRAYS, SOLAR CELLS, SPACECRAFT POWER SUPPLIES

N90-20454* National Aeronautics and Space Administration. Lewis Research Center, Cleveland, OH.
SPACE ELECTROCHEMICAL RESEARCH AND TECHNOLOGY (SERT), 1989
(NASA-CP-3030; E-4587; NAS 1.55:3030) Avail: NTIS HC A16/MF A03 CSCL 10A

SPACE ELECTROCHEMICAL RESEARCH AND TECHNOLOGY (SERT), 1989
(NASA-CP-3056; E-4708; NAS 1.55:3056) Avail: NTIS HC A16/MF A03 CSCL 10A

SPACE ELECTROCHEMICAL RESEARCH AND TECHNOLOGY (SERT), 1989
(NASA-CP-3056; E-4708; NAS 1.55:3056) Avail: NTIS HC A16/MF A03 CSCL 10A

CONFERENCES, ELECTRIC BATTERIES, ELECTRIC ENERGY STORAGE, ELECTROCATALYSTS, ELECTROCHEMISTRY, ELECTRODE MATERIALS, HYDROGEN OXYGEN FUEL CELLS, NICKEL HYDROGEN BATTERIES, SPACECRAFT POWER SUPPLIES

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ENVIRONMENT POLLUTION

Includes atmospheric, noise, thermal, and water pollution.

N87-14503* # National Aeronautics and Space Administration. Goddard Space Flight Center, Greenbelt, MD.

POLAR OZONE WORKSHOP. ABSTRACTS


ANTARCTIC REGIONS, ATMOSPHERIC CHEMISTRY, ATMOSPHERIC COMPOSITION, CONFERENCES, EARTH OBSERVATIONS (FROM SPACE), OZONE, OZONE DEPLETION, OZONOMETRY, POLAR METEOROLOGY, STRATOSPHERE

GEOPHYSICS

Includes aeronomy; upper and lower atmosphere studies; ionospheric and magnetospheric physics; and geomagnetism.

N87-11356* # 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 altitude, 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. N), peak backscatter ratios at a wavelength of 0.6943 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

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

FUTURE DIRECTIONS FOR H SUB X O SUB Y DETECTION


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

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

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

M. PATRICK MCCORMICK Feb. 1987 274 p (NASA-RP-1173; L-16177; NAS 1.61:1173) Avail: NTIS HC A12/MF A02 CSCL 04A

The Stratospheric Aerosol and Gas Experiment (SAGE) satellite system, launched February 18, 1979, obtained profiles of aerosol extinction at 0.45 micron and 0.45 micron concentrations, and therefore the amount of volcanic activity. The distribution of the ratio of aerosol to molecular extinction at 0.45 micron to aerosol extinction 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 maximum 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 intent is 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-1176; L-16034; NAS 1.61:1176) 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 altitude, and contours of backscattering 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 -4/sr 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

N88-29233/# National Aeronautics and Space Administration, Washington, DC.
PRESENT STATE OF KNOWLEDGE OF THE UPPER ATMOSPHERE 1988: AN ASSESSMENT REPORT
(NASA-RP-1208; NAS 1.61:1208) Avail: NTIS HC A10/MF A02 CSCL 04A
This document was issued in response to the Clean Air Act Amendments of 1977, Public Law 95-95, mandating that NASA and other key agencies submit biennial reports to Congress and EPA. This is to report on the state of our knowledge of the upper atmosphere, particularly the stratosphere. This is the sixth ozone assessment report submitted to Congress and the concerned regulatory agencies. Part 1 contains an outline of the NASA Upper Atmosphere Research Program and summaries of the research efforts supported during the last two years. An assessment is presented of the state of knowledge as of March 15, 1986 when the Ozone Trends Panel, organized by NASA and co-sponsored by the World Meteorological Organization, NOAA, FAA and the United Nations Environment Program released an executive summary of its findings from a critical in-depth study involving over 100 scientists from 12 countries. Chapter summaries of the International Ozone Trends Panel Report form the major part of this report. Two other sections are Model Predictions of Future Ozone Change and Chemical Kinetics and Photochemical Data for Use in Stratospheric Modeling. Each of these sections and the report in its entirety were peer reviewed.

Author

N89-18084*# National Aeronautics and Space Administration, Washington, DC.
INTO THE THERMOSPHERE: THE ATMOSPHERE EXPLORERS
ERIC BURGESS and DOUGGLASS TORR 1987 172 p
Original document contains color illustrations
(NASA-SP-490; NAS 1.21:490; LC-87-14156) Avail: SOD HC $14.00 as 033-000-01013-3; NTIS MF A01 CSCL 04A
The need to study the lower thermosphere with the new instrument, data handling, and spacecraft technology available in the 1960s led to the formulation and establishment of the Atmospheric Explorer program. This book provides an overview of this program with particular emphasis on the AE3, AE4, and AE5 satellites, which represent early examples of problem-directed missions. Both the satellites and their instrumentation on the one hand and the experimental and scientific considerations in studying the thermosphere on the other are discussed. J.P.B.

N89-19037/# National Aeronautics and Space Administration, Goddard Space Flight Center, Greenbelt, MD.
CRUSTAL DYNAMICS PROJECT: CATALOGUE OF SITE INFORMATION
CAREY E. NOLL, ed. Mar. 1988 539 p
(NASA-RP-1198; REPT-88B9999; NAS 1.61:1198) Avail: NTIS HC A13/MF A02 CSCL 04A
This document represents a catalog of site information for the Crustal Dynamics Project. It contains information on and descriptions of those sites used by the Project as observing stations for making the precise geodetic measurements necessary for studies of the Earth’s crustal movements and deformation.

Author

N89-25094*# National Aeronautics and Space Administration, Langley Research Center, Hampton, VA.
SAM 2 DATA USER’S GUIDE
(NASA-RP-1200; L-16377; NAS 1.61:1200) Avail: NTIS HC A03/MF A01 CSCL 04A
This document is intended to serve as a guide to the use of the data products from the Stratospheric Aerosol Measurement (SAM) 2 experiment for scientific investigations of polar stratospheric aerosols. Included is a detailed description of the Beta and Aerosol Number Density Archive Tape (BANAT), which is the SAM 2 data product containing the aerosol extinction data available for these investigations. Also included are brief descriptions of the instrument operation, data collection, processing and validation, and some of the scientific analyses conducted to date.

Author

N89-10420*# National Aeronautics and Space Administration, Langley Research Center, Hampton, VA.
COMPILATION OF METHODS IN ORBITAL MECHANICS AND SOLAR GEOMETRY

52
This paper contains a collection of computational algorithms for determining geocentric ephemerides of Earth satellites, useful for both mission planning and data reduction applications. Special emphasis is placed on the computation of sidereal time, and on the determination of the geocentric coordinate of the center of the Sun, all to the accuracy found in the Astronomical Almanac. The report is completely self-contained in that no requirement is placed on any external source of information, and hence, these methods are ideal for computer application.

Author

N89-25540*# National Aeronautics and Space Administration. Langley Research Center, Hampton, VA.

COMPARISON OF SATELLITE-DERIVED DYNAMICAL QUANTITIES FOR THE STRATOSPHERE OF THE SOUTHERN HEMISPHERE

ATMOSPHERIC CIRCULATION, GEOPOTENTIAL HEIGHT, SATELLITE OBSERVATION, STRATOSPHERE, ZONAL FLOW (METEOROLOGY)


NIMBUS-7 STRATOSPHERIC AND MESOSPHERIC SOUNDER (SAMS) EXPERIMENT DATA USER'S GUIDE
(NASA-RP-1221; NAS 1.61:1221; REPT-89B00074) Avail: NTIS HC A07/MF A01 CSCL 08G

The Stratospheric and Mesospheric Sounder (SAMS) aboard Nimbus-7 observes infrared radiation from the atmospheric limb. Global upper atmosphere temperature profiles and vertical concentrations of H2O, NO, N2O, CH4 and CO2 are derived from these measurements. The status of all channels was carefully monitored. Temperature and composition were retrieved from the measurements by linearizing the direct equation about an a priori profile and using an optimum statistical estimator to find the most likely solution. The derived temperature and composition profiles are archived on two tape products whose file structure and record formats are described in detail. The gridded retrieved temperature tape (GRID-T) contains daily day and night average temperatures at 62 pressure levels in a 2.5 degree latitude by 10 degree longitude grid extending from 67.5 degrees N to 50 degrees S. The zonal mean methane and nitrous oxide composition tape (ZMT-G) contains zonal mean day and night average CH4 and N2O mixing ratios at 31 pressure levels for 2.5 degrees latitude zones extending from 67.5 degrees N to 50 degrees S. 

Author

N89-28896*# Jet Propulsion Lab., California Inst. of Tech., Pasadena.

CROFTON B. FARMER and ROBERT H. NORTON 1989 535 p. (NAS7-918)
(NASA-RP-1224-VOL-1; NAS 1.61:1224-VOL-1; JPL-400-370-VOL-1) Avail: NTIS HC A23/MF A03 CSCL 04A

During the period April 29 through May 2, 1985, the Atmospheric Trace Molecule Spectroscopy experiment was operated as part of the Spacelab-3 payload of the shuttle Challenger. The principal purpose of this experiment was to study the distributions of the atmosphere's minor and trace molecular constituents. The instrument, a modified Michelson interferometer covering the frequency range from 600 to 5000/cm-1 at a spectral resolution of 0.01/cm-1, recorded infrared absorption spectra of the sun and of the Earth's atmosphere at times close to entry into and exit from occultation by the Earth's limb. Spectra were obtained that are free from absorptions due to constituents of the atmosphere (i.e., they are pure solar spectra), as well as spectra of the atmosphere itself, covering line-of-sight tangent altitudes that span the range from the lower thermosphere to the bottom of the troposphere. This atlas provides a compilation of these spectra arranged in a hardcopy format suitable for quick-look reference purposes. Volume 2 covers the stratosphere and mesosphere (i.e., tangent altitudes from 20 to 80 km) for frequencies from 650 to 3350/cm-1.

Author

N90-11405*# National Aeronautics and Space Administration. Goddard Space Flight Center, Greenbelt, MD.

TWO-DIMENSIONAL INTERCOMPARISON OF STRATOSPHERIC MODELS

ATMOSPHERIC MODELS, CONFERENCES, DATA BASES, PHOTOCHEMICAL REACTIONS, RADIATIVE TRANSFER, STRATOSPHERE, TWO DIMENSIONAL MODELS


CROFTON B. FARMER and ROBERT H. NORTON 1989 535 p. (NAS7-918)
(NASA-RP-1224-VOL-1; NAS 1.61:1224-VOL-1; JPL-400-370-VOL-1) Avail: NTIS HC A23/MF A03 CSCL 04A

During the period April 29 through May 2, 1985, the Atmospheric Trace Molecule Spectroscopy experiment was operated as part of the Spacelab-3 payload of the shuttle Challenger. The instrument, a modified Michelson Interferometer covering the frequency range from 600 to 5000/cm, at a spectral resolution of 0.01/cm, recorded infrared spectra of the Sun and of the Earth's atmosphere at times close to entry into and exit from occultation by the Earth's limb as seen from the shuttle orbit of 360 km. Spectra were obtained that are free from absorptions due to constituents of the atmosphere (i.e., solar pure spectra), as well as spectra of the atmosphere itself, covering line-of-sight tangent altitudes that span the range from the lower thermosphere to the bottom of the troposphere. This atlas, believed to be the first record of observations of the continuous high resolution infrared spectrum of the Sun and the Earth's atmosphere from space, provides a compilation of these spectra arranged in a hardcopy format suitable for quick-look reference purposes; the data are also available in digital form.

Author

N90-17227*# National Aeronautics and Space Administration. Goddard Space Flight Center, Greenbelt, MD.

NIMBUS 7 SOLAR BACKSCATTER ULTRAVIOLET (SBUV) OZONE PRODUCTS USER'S GUIDE
Three ozone tape products from the Solar Backscatter Ultraviolet (SBUV) experiment aboard Nimbus 7 were archived at the National Space Science Data Center. The experiment measures the fraction of incoming radiation backscattered by the Earth's atmosphere at 12 wavelengths. In-flight measurements were used to monitor changes in the instrument sensitivity. Total column ozone is derived by comparing the measurements with calculations of what would be measured for different total ozone amounts. The altitude distribution is retrieved using an optimum statistical technique for the inversion. The estimated initial error in the absolute scale for total ozone is 2 percent, with a 3 percent drift over 8 years. The profile error depends on latitude and height, smallest at 5 to 10 mbar; the drift increases with increasing altitude.

Three products are described: The High Density SBUV (HDSBUV) tape contains the final derived products - the total ozone and the vertical ozone profile - as well as much detailed diagnostic information generated during the retrieval process. The Compressed Ozone (CPOZ) tape contains only that subset of HDSBUV information, including total ozone and ozone profiles, considered most useful for scientific studies. The Zonal Means Tape (ZMT) contains daily, weekly, monthly and quarterly averages of the derived quantities over 10 degrees latitude zones.

A gridded surface-elevation data set and a geo-referenced data base for the Seasat radar altimeter data over Greenland are described in detail, including the editing and retracking algorithm to correct for height errors caused by lags in the automatic range tracking circuit. The methods for radial adjustment of the orbits and estimation of the slope-induced errors are given.

A gridded surface-elevation data set and a geo-referenced data base for the Seasat radar altimeter data over Antarctica are described. It is intended to be a user's guide to accompany the data provided to data centers and other users. The grid points are on a polar stereographic projection with a nominal spacing of 20 km. The gridded elevations are derived from the elevation data in the geo-referenced data base by a weighted fitting of a surface in the neighborhood of each grid point. The gridded elevations are useful for the creation of large-scale contour maps, and the geo-referenced data base is useful for regridding, creating smaller-scale contour maps, and examining individual elevation measurements in specific geographic areas. Tape formats are described, and a FORTRAN program for reading the data tape is listed and provided on the tape.

A gridded surface-elevation data set and a geo-referenced data base for the Seasat radar altimeter data over Greenland are described. A summary of the processing procedure and examples of return waveform data are given. The elevation data are used to generate a regular grid which is then computer contoured to provide an elevation contour map. Ancillary maps show the statistical quality of the elevation data and various characteristics of the surface. The elevation map is used to define ice flow directions and delineate the major drainage basins. Regular maps of the Jakobshavn Glacier drainage basin and the ice divide in the vicinity of Crete Station are presented. Altimeter derived elevations are compared with elevations measured by satellite geocivers and optical surveying.
contributed to this report and the science assessments which have formed our present state of knowledge of the upper atmosphere and ozone depletion.

Author

47 METEROELOGY AND CLIMATOLOGY

Includes weather forecasting and modification.


ERROR ANALYSIS, RADIOSONDES, THERMISTORS


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


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.

Author


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


An atlas of monthly mean outgoing longwave radiation global contour maps and associated spherical harmonic coefficients is presented. The atlas contains 36 months of continuous data from July 1975 to June 1978. The data were derived from the first Earth radiation budget experiment, which was flown on the Nimbus-6 Sun-synchronous satellite in 1975. Only the wide-angle, near-view longwave measurements are cataloged in this atlas. The contour maps along with the associated sets of spherical harmonic coefficients form a valuable data set for studying different aspects of our changing climate over monthly, annual, and interannual scales in the time domain, and over regional, zonal, and global scales in the spatial domain.

Author


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.

Author


An atlas of monthly mean outgoing longwave radiation global contour maps and associated spherical harmonic coefficients is presented. The atlas contains 84 months of continuous data from November 1978 to October 1985, the data were derived from the second Earth radiation budget experiment, which was flown on the Nimbus 7 Sun-synchronous satellite in 1978. This data set is a companion set and extension to a similar report of the Nimbus
The models consist of both bidirectional and directional parameters. The bidirectional parameters are anisotropic function, standard deviation of mean radiance, and shortwave-longwave radiance correlation coefficient. The directional parameters are mean albedo as a function of Sun zenith angle and mean albedo normalized to overhead Sun. Derivation of these models from the Nimbus 7 ERB (Earth Radiation Budget) and Geostationary Operational Environmental Satellite (GOES) data sets is described. Tabulated values and computer-generated plots are included for the bidirectional and directional modes.


**N88-20772** National Aeronautics and Space Administration. Langley Research Center, Hampton, VA. **SUMMARY OF ALONG-TRACK DATA FROM THE EARTH RADIATION BUDGET SATELLITE FOR SEVERAL MAJOR DESERT REGIONS** DAVID R. BROOKS and MARTA A. FENN May 1988 147 p (NASA-RI-1197; L-16401; NAS 1.61:1197) Avail: NTIS HC A07/MF A01 CSCL 04B For several days in January and August 1985, the Earth Radiation Budget Satellite, a component of the Earth Radiation Budget Experiment (ERBE), was operated in an along-track scanning mode. A survey of radiance measurements taken in this mode is given for five ocean regions: the north and south Atlantic, the Arabian Sea, the western Pacific north of the Equator, and the intertropical convergence zone. Each overflight contains information about the clear scene and three cloud categories: partly cloudy, mostly cloudy, and overcast. The data presented include the variation of longwave and shortwave radiance in each scene classification as a function of viewing zenith angle during each overflight of one of the five target regions. Several features of interest in the development of anisotropic models are evident, including the azimuthal dependence of shortwave radiance that is an essential feature of shortwave bidirectional models. The data also demonstrate that the scene classification algorithm employed by the ERBE results in scene classifications that are a function of viewing geometry. Author


**N88-27677** National Aeronautics and Space Administration. Langley Research Center, Hampton, VA. **ANGULAR RADIATION MODELS FOR EARTH-ATMOSPHERE SYSTEM. VOLUME 1: SHORTWAVE RADIATION** J. T. SUTTLES, R. N. GREEN, P. MINNIS, G. L. SMITH, F. W. STAYLOR, B. A. WIELICKI, I. J. WALKER, D. F. YOUNG, V. R. TAYLOR, and L. L. STOWE (National Oceanic and Atmospheric Administration, Washington, D.C.) Jul. 1988 148 p (NASA-RI-1184; L-16414; NAS 1.61:1184) Avail: NTIS HC A07/MF A01 CSCL 04B Presented are shortwave angular radiation models which are required for analysis of satellite measurements of Earth radiation, such as those from the Earth Radiation Budget Experiment (ERBE). The models consist of both bidirectional and directional parameters. The data also demonstrate that the ERBE results in scene classifications that are a function of viewing geometry. Author

**N89-14648** National Aeronautics and Space Administration. Goddard Space Flight Center, Greenbelt, MD. **USER'S GUIDE FOR THE NIMBUS 7 SCANNING MULTICHANNEL MICROWAVE RADIOMETER (SMMR). CELL-ALL TAPE** C. C. CU, D. HAN, S. T. KIM (ST Systems Corp., Lanham, Md.), and P. GLOERSEN Oct. 1988 152 p (NASS-29386) NASA-RP-1210; REPT-88-181; NAS 1.61:1210) Avail: NTIS HC A08/MF A01 CSCL 04B The SMMR instrument onboard the Nimbus-7 satellite has been in operation since October 1978. It provided global coverage of passive microwave observations at 6.6, 10.7, 18, 21, and 37 GHz. The observed brightness temperature can be used to retrieve geophysical parameters, principally sea surface temperature, atmospheric water vapor and liquid water content over oceans, sea ice concentration, and snow cover over land. The SMME CELL-ALL Tape contains earth-located calibrated brightness temperature data which have been appropriately binned into cells of various grid sizes, allowing intercomparisons of observations made at different frequencies (with corresponding different footprint sizes). This user's guide describes the operation of the instrument, the flow of the data processing the calibration procedure, and the characteristics of the calibrated brightness temperatures and how they are binned. Detailed tape specifications and lists of available data are also provided. Author

**N89-17374** National Aeronautics and Space Administration. Langley Research Center, Hampton, VA. **LIMB-DARKENING FUNCTIONS AS DERIVED FROM ALONG-TRACK OPERATIONS OF THE ERBE SCANNING RADIOMETER FOR JANUARY 1985** G. LOUIS SMITH, NATIVIDAD MANALO, JOHN T. SUTTLES, and IRA WALKER (Planning Research Corp., Hampton, VA.)
An atlas of monthly mean global contour maps of albedo and absorbed solar radiation. The atlas is based on 35 years of continuous measurements from July 1975 through May 1987. The data were retrieved from measurements made by the shortwave wide field-of-view radiometer of the first Earth Radiation Budget (ERB) instrument, which flew on the Nimbus 6 spacecraft in 1975. Profiles of zonal mean albedos and absorbed solar radiation are tabulated. These geographical distributions are provided as a resource for studying the radiation budget of the earth. This atlas of albedo and absorbed solar radiation complements the atlases of outgoing longwave radiation by Bess and Smith in NASA-RP-1185 and RP-1186, also based on the Nimbus 7 ERB (Earth Radiation Budget) data set. The data are described. Computed values and computer-generated plots are included for the limb-darkening and mean-flux models. Author

N90-14741*# National Aeronautics and Space Administration. Langley Research Center, Hampton, VA. ATLAS OF ALBEDO AND ABSORBED SOLAR RADIATION DERIVED FROM NIMBUS 7 EARTH RADIATION BUDGET DATA SET, JULY 1975 TO MAY 1978 G. LOUIS SMITH, T. DALE BESS, and DAVID RUTAN (PRC Kentron, Inc., Hampton, VA.) 1989 88 p (NASA-RP-1230; L-16601; NAS 1.61:1230) Avail: NTIS HC A05/MF A01 CSCL 04D An atlas of monthly mean global contour maps of albedo and absorbed solar radiation is presented. The atlas is based on 35 months of continuous measurements from July 1975 through May 1978. The data were retrieved from measurements made by the shortwave wide field-of-view radiometer of the first Earth Radiation Budget (ERB) instrument, which flew on the Nimbus 6 spacecraft in 1975. Profiles of zonal mean albedos and absorbed solar radiation are tabulated. These geographical distributions are provided as a resource for studying the radiation budget of the earth. This atlas of albedo and absorbed solar radiation complements the atlases of outgoing longwave radiation by Bess and Smith in NASA-RP-1185 and RP-1186, also based on the Nimbus 6 and 7 ERB data. Author

N90-17233*# National Aeronautics and Space Administration. Langley Research Center, Hampton, VA. ATLAS OF ALBEDO AND ABSORBED SOLAR RADIATION DERIVED FROM NIMBUS 7 EARTH RADIATION BUDGET DATA SET, NOVEMBER 1978 TO OCTOBER 1985 G. LOUIS SMITH, DAVID RUTAN (PRC Kentron, Inc., Hampton, VA.), and T. DALE BESS Washington Jan. 1990 213 p (NASA-RP-1231; L-16591; NAS 1.61:1231) Avail: NTIS HC A10/MF A02 CSCL 04B An atlas of monthly mean global contour maps of albedo and absorbed solar radiation is presented. This atlas contains 7 years of continuous data from November 1978 through October 1985. The data were retrieved from measurements made by the second Earth Radiation Budget (ERB) wide field-of-view instrument, which
47 METEOROLOGY AND CLIMATOLOGY

flew on the Nimbus 7 spacecraft in 1978. The deconvolution method used to produce these data is briefly discussed here so that the user may understand their generation and limitations. These geographical distributions of albedo and absorbed solar radiation are provided as a resource for researchers studying the radiation budget of the Earth. This atlas of albedo and absorbed solar radiation complements the atlases of outgoing longwave radiation by Bess and Smith, also based on the Nimbus 6 and 7 ERB data.

Author

N90-19718*# National Aeronautics and Space Administration. Langley Research Center, Hampton, VA.
SPANWISE MEASUREMENTS OF VERTICAL COMPONENTS OF ATMOSPHERIC TURBULENCE ROBERT K. SLEEPER Washington Apr. 1990 67 p (NASA-TP-2963; L-16550; NAS 1.60:2963) Avail: NTIS HC A04/MF A01 CSCL 04B
- AUTOCORRELATION, CROSS CORRELATION, FLOW DISTRIBUTION, GUSTS, VERTICAL AIR CURRENTS, WIND VELOCITY

N90-23837*# National Aeronautics and Space Administration. Goddard Space Flight Center, Greenbelt, MD.

Because of the great environmental significance of ozone and to support continuing research at the Antarctic and other Southern Hemisphere stations, the development of the 1989 ozone hole was monitored using data from the Nimbus-7 Total Ozone Mapping Spectrometer (TOMS) instrument, produced in near-real-time. This Atlas provides a complete set of daily polar orthographic projections of the TOMS total ozone measurements over the Southern Hemisphere for the period August 1 through November 30, 1989. The 1989 ozone hole developed in a manner similar to that of 1987, reaching a comparable depth in early October. This was in sharp contrast to the much weaker hole of 1986. The 1969 ozone hole remained at polar latitudes as it filled in November, in contrast to other recent years when the hole 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.

B.G.

N90-28224*# National Aeronautics and Space Administration. Langley Research Center, Hampton, VA.
- CIRRUS CLOUDS, CLIMATOLOGY, CLOUDS (METEOROLOGY), CONFERENCES, MARINE METEOROLOGY, OPTICAL PROPERTIES, REMOTE SENSING, STRATOCUMULUS CLOUDS, THERMODYNAMIC PROPERTIES

48 OCEANOGRAPHY

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

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

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.

N90-19287*# National Aeronautics and Space Administration. Lyndon B. Johnson Space Center, Houston, TX.
- BIOPROCESSING, BIOREACTORS, BIOTECHNOLOGY, CELLS (BIOLOGY), CONFERENCES, CULTURE TECHNIQUES, REDUCED GRAVITY, SPACE PROCESSING, TISSUES (BIOLOGY)
52 AEROSPACE MEDICINE

Includes physiological factors; biological effects of radiation; and effects of weightlessness on man and animals.

N87-18976* National Aeronautics and Space Administration, Washington, DC.
AEROSPACE MEDICINE AND BIOLOGY: A CUMULATIVE INDEX TO THE 1986 ISSUES (SUPPLEMENT 293) Jan. 1987 251 p (NASA-SP-7011(293); NAS 1.21:7011(293)) Avail: NTIS HC A12 CSCL 06E

This publication is a cumulative index to the abstracts contained in the Supplements 281 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

N87-30041* National Aeronautics and Space Administration, Washington, DC.

This bibliography lists 131 reports, articles, and other documents introduced into the NASA scientific and technical information system in September, 1987. Author

N88-14623* National Aeronautics and Space Administration. Lyndon B. Johnson Space Center, Houston, TX.

AEROSOLS, AEROSPACE ENVIRONMENTS, AIR PURIFICATION, AIR QUALITY, SPACECRAFT DESIGN
HYPOKINESIA, LOWER BODY NEGATIVE PRESSURE, (NASA-TP-3037; A-85177; NAS 1.60:3037) Avail: NTIS HC

BIBLIOGRAPHY WITH INDEXES (SUPPLEMENT 315)
Oct. 1988 71 p
(NASA-SP-7011(315); NAS 1.21:7011(315)) Avail: NTIS HC A04; NTIS standing order as PB88-912300. $9.00 domestic, $18.00 foreign CSCL 06E

This bibliography lists 127 reports, articles and other documents introduced into the NASA scientific and technical information system in September, 1988. Author

AEROSPACE MEDICINE AND BIOLOGY: A CUMULATIVE INDEX TO A CONTINUING BIBLIOGRAPHY (SUPPLEMENT 327)
Feb. 1989 53 p
(NASA-SP-7011(327); NAS 1.21:7011(327)) Avail: NTIS HC A04; NTIS standing order as PB89-912300. $10.50 domestic, $21.00 foreign CSCL 06E

This bibliography lists 127 reports, articles and other documents introduced into the NASA Scientific and Technical Information System during August, 1989. Subject coverage includes: aerospace medicine and psychology, life support systems and controlled environments, safety equipment, exobiology and extraterrestrial life, and flight crew behavior and performance. Author

AEROSPACE MEDICINE AND BIOLOGY: A CUMULATIVE BIBLIOGRAPHY WITH INDEXES (SUPPLEMENT 330)
Jan. 1988 210 p
(NASA-SP-7011(330); NAS 1.21:7011(330)) Avail: NTIS HC A10 CSCL 06E

This publication is a cumulative index to the abstracts contained in the Supplements 294 through 305 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

AEROSPACE MEDICINE AND BIOLOGY: A CUMULATIVE BIBLIOGRAPHY WITH INDEXES (SUPPLEMENT 340)
Feb. 1989 64 p
(NASA-SP-7011(340); NAS 1.21:7011(340)) Avail: NTIS HC A03; NTIS standing order as PB90-912300. $11.50 domestic, $23.00 foreign CSCL 06E

This bibliography lists 157 reports, articles and other documents introduced into the NASA Scientific and Technical Information System during August 1990. Subject coverage includes: aerospace medicine and psychology, life support systems and controlled environments, safety equipment, exobiology and extraterrestrial life, and flight crew behavior and performance. Author

AEROSPACE MEDICINE AND BIOLOGY: A CUMULATIVE BIBLIOGRAPHY WITH INDEXES (SUPPLEMENT 341)
Feb. 1989 64 p
(NASA-SP-7011(341); NAS 1.21:7011(341)) Avail: NTIS HC A06; NTIS standing order as PB90-912300. $11.50 domestic, $23.00 foreign CSCL 06E

This bibliography lists 157 reports, articles and other documents introduced into the NASA Scientific and Technical Information System during August 1990. Subject coverage includes: aerospace medicine and psychology, life support systems and controlled environments, safety equipment, exobiology and extraterrestrial life, and flight crew behavior and performance. Author

AEROSPACE MEDICINE AND BIOLOGY: A CUMULATIVE BIBLIOGRAPHY WITH INDEXES (SUPPLEMENT 342)
Feb. 1989 64 p
(NASA-SP-7011(342); NAS 1.21:7011(342)) Avail: NTIS HC A07; NTIS standing order as PB90-912300. $11.50 domestic, $23.00 foreign CSCL 06E

This bibliography lists 157 reports, articles and other documents introduced into the NASA Scientific and Technical Information System during August 1990. Subject coverage includes: aerospace medicine and psychology, life support systems and controlled environments, safety equipment, exobiology and extraterrestrial life, and flight crew behavior and performance. Author
MATHEMATICAL AND COMPUTER SCIENCES (GENERAL)

CONFERENCES, PLANTS (BOTANY), SPACECRAFT ENVIRONMENTS

N89-18039* # National Aeronautics and Space Administration. Ames Research Center, Moffett Field, CA.
INTERACTIVE ORBITAL PROXIMITY OPERATIONS PLANNING SYSTEM
ARTHUR J. GRUNWALD and STEPHEN R. ELLIS Nov. 1988 48 p
NASA-TP-2839; A-88091; NAS 1.60:2839
Avail: NTIS HC A03/MF A01 CSCL 05H
COMPUTER GRAPHICS, ORBITAL MANEUVERS, PROXIMITY, SPACE STATIONS, SPACECRAFT TRAJECTORIES

N90-22918* # National Aeronautics and Space Administration. Ames Research Center, Moffett Field, CA.
SPATIAL DISPLAYS AND SPATIAL INSTRUMENTS
NASA-CP-10032; A-88090; NAS 1.55:10032
Avail: NTIS HC A99/MF A04 CSCL 12B
COMPUTER GRAPHICS, CONFERENCES, DISPLAY DEVICES, IMAGE ANALYSIS, SPATIAL RESOLUTION, VISUAL PERCEPTION

N90-22965* # National Aeronautics and Space Administration. Langley Research Center, Hampton, VA.
DETERMINATION OF DEPTH-VIEWING VOLUMES FOR STEREO THREE-DIMENSIONAL GRAPHIC DISPLAYS
DA PROJ. 1L1-61102-AH-45
NASA-TP-2998; L-16655; NAS 1.60:2998; AVSCOM-TM-90-8-016
Avail: NTIS HC A03/MF A01 CSCL 05H
COMPUTER GRAPHICS, DEPTH, SPACE PERCEPTION, STEREOSCOPIC VISION, VISUAL SIGNALS

SPACE BIOLOGY

Includes exobiology; planetary biology; and extraterrestrial life.

N90-19399* # National Aeronautics and Space Administration. Ames Research Center, Moffett Field, CA.
CELLS IN SPACE
NASA-CP-10034; A-89131; NAS 1.55:10034
Avail: NTIS HC A14/MF A01 CSCL 06C
CELLS (BIOLOGY), CONFERENCES, EXPERIMENT DESIGN, GRAVITATIONAL EFFECTS, GRAVITATIONAL PHYSIOLOGY, MANNED SPACE FLIGHT, SPACEBORNE EXPERIMENTS

MATHEMATICAL AND COMPUTER SCIENCES (GENERAL)

N88-14629* # National Aeronautics and Space Administration. Ames Research Center, Moffett Field, CA.
A GENERAL SOLUTION TO THE SILHOUETTE PROBLEM
DAVID R. HEDGLEY, JR. Feb. 1987 9 p
NASA-TP-2695; H-1348; NAS 1.60:2695
Avail: NTIS HC A02/MF A01 CSCL 12A
COMPUTER GRAPHICS, DISPLAY DEVICES, IMAGE ENHANCEMENT, IMAGE PROCESSING

N90-13939* # National Aeronautics and Space Administration. Ames Research Center, Moffett Field, CA.
CELLS IN SPACE
NASA-CP-10034; A-89131; NAS 1.55:10034
Avail: NTIS HC A14/MF A01 CSCL 06C
CELLS (BIOLOGY), CONFERENCES, EXPERIMENT DESIGN, GRAVITATIONAL EFFECTS, GRAVITATIONAL PHYSIOLOGY, MANNED SPACE FLIGHT, SPACEBORNE EXPERIMENTS

55

MATHEMATICAL AND COMPUTER SCIENCES (GENERAL)

N88-14629* # National Aeronautics and Space Administration. Ames Research Center, Moffett Field, CA.
A GENERAL SOLUTION TO THE SILHOUETTE PROBLEM
DAVID R. HEDGLEY, JR. Feb. 1987 9 p
NASA-TP-2695; H-1348; NAS 1.60:2695
Avail: NTIS HC A02/MF A01 CSCL 12A
COMPUTER GRAPHICS, DISPLAY DEVICES, IMAGE ENHANCEMENT, IMAGE PROCESSING

N88-17206* # National Aeronautics and Space Administration. Lyndon B. Johnson Space Center, Houston, TX.
FIRST ANNUAL WORKSHOP ON SPACE OPERATIONS AUTOMATION AND ROBOTICS (SOAR 87)
NASA-CP-2491; S-567; NAS 1.55:2491
Avail: NTIS HC A23/MF A04 CSCL 12B
ARCHITECTURE (COMPUTERS), AUTOMATIC CONTROL, COMPUTER AIDED DESIGN, CONFERENCES, DISTRIBUTED PROCESSING, EXPERT SYSTEMS, LOGISTICS, MAN MACHINE SYSTEMS, NEURAL NETS, PARALLEL PROCESSING (COMPUTERS), ROBOTICS

N88-21646* # National Aeronautics and Space Administration. Langley Research Center, Hampton, VA.
CARE 3 USER’S WORKSHOP
NASA-CP-10011; NAS 1.55:10011
Avail: NTIS HC A08/MF A01 CSCL 12A
COMPUTER PROGRAMS, CONFERENCES, FAULT TOLERANCE, RELIABILITY ANALYSIS

N89-19817* # National Aeronautics and Space Administration. Lyndon B. Johnson Space Center, Houston, TX.
SECOND ANNUAL WORKSHOP ON SPACE OPERATIONS AUTOMATION AND ROBOTICS (SOAR 1988)
NASA-CP-3019; S-585; NAS 1.55:3019
Avail: NTIS HC A22/MF A04 CSCL 12A
COMPUTER ASSISTED INSTRUCTION, COMPUTER TECHNIQUES, EXPERT SYSTEMS, HUMAN FACTORS ENGINEERING, INFORMATION SYSTEMS, KNOWLEDGE BASES (ARTIFICIAL INTELLIGENCE), ROBOTICS, SYSTEMS INTEGRATION, TELEOPERATORS

N90-21524* # National Aeronautics and Space Administration. Langley Research Center, Hampton, VA.
A TIME-ACCURATE ADAPTIVE GRID METHOD AND THE NUMERICAL SIMULATION OF A SHOCK-VORTEX INTERACTION
NASA-TP-2998; L-16727; NAS 1.60:2998
Avail: NTIS HC A03/MF A01 CSCL 12A
COMPUTATIONAL GRIDS, COMPUTERIZED SIMULATION, GRID GENERATION (MATHEMATICS), SHOCK WAVE INTERACTION, VORTICES
59 MATHEMATICAL AND COMPUTER SCIENCES (GENERAL)

**N90-25503** National Aeronautics and Space Administration.
Lyndon B. Johnson Space Center, Houston, TX.
**THIRD ANNUAL WORKSHOP ON SPACE OPERATIONS AUTOMATION AND ROBOTICS (SOAR 1989)**

AEROSPACE ENVIRONMENTS, AUTOMATIC CONTROL, CONFERENCES, END EFFECTORS, EXPERT SYSTEMS, HUMAN FACTORS ENGINEERING, KNOWLEDGE BASES (ARTIFICIAL INTELLIGENCE), MANIPULATORS, ROBOTICS, ROBOTS, SPACE STATIONS, SPACECRAFT CONTAMINATION, TELEOPERATORS

**60**

**COMPUTER OPERATIONS AND HARDWARE**

Includes hardware for computer graphics, firmware, and data processing.

**N78-74659** National Aeronautics and Space Administration.
Marshall Space Flight Center, Huntsville, AL.
**THE MSFC/UH DATA MANAGEMENT SYMPOSIUM**

ALABAMA, CONFERENCES, DATA MANAGEMENT, NASA PROGRAMS, UNIVERSITIES

**N88-20833** National Aeronautics and Space Administration.
Langley Research Center, Hampton, VA.
**DIGITAL ENHANCEMENT OF FLOW FIELD IMAGES**

DIGITAL TECHNIQUES, FLOW VISUALIZATION, IMAGE ENHANCEMENT, IMAGE PROCESSING, PHOTOGRAPHIC PROCESSING

**N90-20651** National Aeronautics and Space Administration.
Lyndon B. Johnson Space Center, Houston, TX.
**GRAPHICS TECHNOLOGY IN SPACE APPLICATIONS (GTSA 1989)**

COMPUTER ANIMATION, COMPUTER GRAPHICS, CONFERENCES, DISPLAY DEVICES, MAN MACHINE SYSTEMS, SPACE SHUTTLES, SPACE STATIONS, SYSTEMS SIMULATION, TELEOPERATORS, TRAINING SIMULATORS

**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**


ACCESS CONTROL, COMPUTER NETWORKS, FORMAT, IMAGE PROCESSING, SOFTWARE ENGINEERING, SOFTWARE TOOLS, SPACE STATIONS

**N87-19931** National Aeronautics and Space Administration, Washington, DC.
**COMPUTER SCIENCES AND DATA SYSTEMS, VOLUME 1**

ARCHITECTURE (COMPUTERS), CONCURRENT PROCESSING, CONFERENCES, DATA MANAGEMENT, DISTRIBUTED PROCESSING, EXPERT SYSTEMS, SOFTWARE ENGINEERING

**N87-19932** National Aeronautics and Space Administration, Washington, DC.
**COMPUTER SCIENCES AND DATA SYSTEMS, VOLUME 2**

CONFERENCES, DATA STORAGE, DISTRIBUTED PROCESSING, FIBER OPTICS, MASSIVELY PARALLEL PROCESSORS, OPTICAL DATA PROCESSING, PARALLEL PROCESSING (COMPUTERS), VHIC (CIRCUITS)

**N87-23156** National Aeronautics and Space Administration.
Goddard Space Flight Center, Greenbelt, MD.
**SIXTH ANNUAL USERS’ CONFERENCE**

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**

ALGORITHMS, COMPUTER GRAPHICS, COMPUTER SYSTEMS PERFORMANCE, COMPUTERIZED SIMULATION, MASSIVELY PARALLEL PROCESSORS, PARALLEL PROCESSING (COMPUTERS)

**N88-16360** National Aeronautics and Space Administration.
Marshall Space Flight Center, Huntsville, AL.
**THIRD CONFERENCE ON ARTIFICIAL INTELLIGENCE FOR SPACE APPLICATIONS, PART 1**

COMPUTER PROGRAMS, CONFERENCES, DATA BASE
61 COMPUTER PROGRAMMING AND SOFTWARE

(NASA-CP-3013; M-599; NAS 1.55:3013) Avail: NTIS HC A21/MF A03 CSCL 09B
AEROSPACE SCIENCES, ARTIFICIAL INTELLIGENCE, EXPERT SYSTEMS, ROBOTICS

(NASA-CP-3025; REPT-89B0038; NAS 1.55:3025) Avail: NTIS HC A03/MF A03 CSCL 09B
COMPUTER PROGRAMS, CONFERENCES, EXPERT SYSTEMS, SOFTWARE TOOLS, SPACE STATIONS

62 LOW-ENERGY GAMMA RAY ATTENUATION

(NASA-CP-2974; L-16719; NAS 1.55:2974) Avail: NTIS HC A03/MF A01 CSCL 09B
AIRCRAFT FUELS, AIRPORTS, ENERGY ABSORPTION, FUEL SYSTEMS, GAMMA RAY ABSORPTION, GAMMA RAYS

(NASA-CP-3057; L-16667; NAS 1.55:3057) Avail: NTIS HC A08/MF A01 CSCL 09B
APPLICATIONS PROGRAMS (COMPUTERS), COMPUTER TECHNIQUES, FAULT TOLERANCE, PREDICTIONS, RELIABILITY

(NASA-CP-3007; NAS 1.55:3007) Avail: NTIS HC A03/MF A01 CSCL 09B
APPLICATIONS OF THE HYBRID AUTOMATED RELIABILITY PREDICTOR: REVISED EDITION

(NASA-CP-3057; L-16719; NAS 1.55:2974) Avail: NTIS HC A03/MF A01 CSCL 09B
APPLICATIONS PROGRAMS (COMPUTERS), COMPUTER TECHNIQUES, FAULT TOLERANCE, PREDICTIONS, RELIABILITY

(NASA-CP-3025; REPT-89B0038; NAS 1.55:3025) Avail: NTIS HC A03/MF A03 CSCL 09B
COMPUTER PROGRAMS, CONFERENCES, SOFTWARE TOOLS, SYSTEMS ENGINEERING

(NASA-CP-2974; L-16719; NAS 1.55:2974) Avail: NTIS HC A03/MF A01 CSCL 09B
APPLICATIONS PROGRAMS (COMPUTERS), COMPUTER TECHNIQUES, FAULT TOLERANCE, PREDICTIONS, RELIABILITY

(NASA-CP-3025; REPT-89B0038; NAS 1.55:3025) Avail: NTIS HC A03/MF A03 CSCL 09B
COMPUTER PROGRAMS, CONFERENCES, SOFTWARE TOOLS, SYSTEMS ENGINEERING

(NASA-CP-3013; M-599; NAS 1.55:3013) Avail: NTIS HC A21/MF A03 CSCL 09B
AEROSPACE SCIENCES, ARTIFICIAL INTELLIGENCE, EXPERT SYSTEMS, ROBOTICS

(NASA-CP-3025; REPT-89B0038; NAS 1.55:3025) Avail: NTIS HC A03/MF A03 CSCL 09B
COMPUTER PROGRAMS, CONFERENCES, EXPERT SYSTEMS, SOFTWARE TOOLS, SPACE STATIONS
62 COMPUTER SYSTEMS

Includes computer networks and special application computer systems.

N87-23202*# National Aeronautics and Space Administration. Lewis Research Center, Cleveland, OH.
APPLICATIONS AND REQUIREMENTS FOR REAL-TIME SIMULATORS IN GROUND-TEST FACILITIES DALE J. ARPSAI and RICHARD A. BLECH Dec. 1986 26 p (NASA-TP-2672; E-3169; NAS 1.60:2672) Avail: NTIS HC A03/MF A01 CSCL 09B
GROUND TESTS, REAL TIME OPERATION, SIMULATORS, TEST FACILITIES

N89-17422*# National Aeronautics and Space Administration. Lewis Research Center, Cleveland, OH.
GAUSSIAN ELIMINATION, MATRICES (MATHEMATICS), MICROCOMPUTERS, MULTIPROCESSING (COMPUTERS), PARALLEL PROGRAMMING

N89-24815*# National Aeronautics and Space Administration. Langley Research Center, Hampton, VA.
COMPUTER PROGRAMS, COMPUTER TECHNIQUES, FAULT TOLERANCE, FAULT TREES, PROBABILITY THEORY, RELIABILITY ANALYSIS

63 CYBERNETICS

Includes feedback and control theory, artificial intelligence, robotics and expert systems.

N88-30330*# National Aeronautics and Space Administration. Goddard Space Flight Center, Greenbelt, MD.
AEROSPACE ENGINEERING, ARTIFICIAL INTELLIGENCE, COMPUTERIZED SIMULATION, CONFERENCES, EXPERT SYSTEMS, IMAGE PROCESSING, MISSION PLANNING

64 NUMERICAL ANALYSIS

Includes iteration, difference equations, and numerical approximation.

N87-14054*# National Aeronautics and Space Administration. Langley Research Center, Hampton, VA.
COMPUTER PROGRAMMING, CRITICAL PATH METHOD, DIFFERENTIAL EQUATIONS, NONLINEAR EQUATIONS, PARAMETER IDENTIFICATION

N87-14918*# National Aeronautics and Space Administration. Lewis Research Center, Cleveland, OH.
SOLUTION OF ELLIPTIC PARTIAL DIFFERENTIAL EQUATIONS BY FAST POISSON SOLVERS USING A LOCAL RELAXATION FACTOR: 2: TWO-STEP METHOD S. C. CHANG May 1986 17 p (NASA-TP-2530; E-2528-1; NAS 1.60:2530) Avail: NTIS HC A03/MF A01 CSCL 12A
ELLIPIC DIFFERENTIAL EQUATIONS, ELLIPIC FUNCTIONS, PARTIAL DIFFERENTIAL EQUATIONS, PROBLEM SOLVING
STATISTICS AND PROBABILITY

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

N87-23244*# National Aeronautics and Space Administration. Langley Research Center, Hampton, VA.
DEVELOPMENT OF CONFIDENCE LIMITS BY PIVOTAL FUNCTIONS FOR ESTIMATING SOFTWARE RELIABILITY KELLY J. DOTSON Jun. 1987 12 p

66 SYSTEMS ANALYSIS

Includes mathematical modeling; network analysis; and operations research.

USER’S MANUAL FOR LINEAR, A FORTRAN PROGRAM TO DERIVE LINEAR AIRCRAFT MODELS EUGENE L. DUKE, BRIAN P. PATTERSON, and ROBERT F. ANTONIEWICZ Dec. 1987 109 p

N89-16437*# National Aeronautics and Space Administration. Hugh L. Dryden Flight Research Facility, Edwards, CA.
USER’S MANUAL FOR LINEAR, A FORTRAN PROGRAM TO DERIVE LINEAR AIRCRAFT MODELS ROBERT F. ANTONIEWICZ, EUGENE L. DUKE, and BRIAN P. PATTERSON Sep. 1988 126 p

N89-16437*# National Aeronautics and Space Administration. Hugh L. Dryden Flight Research Center, Edwards, CA.
USER’S MANUAL FOR LINEAR, A FORTRAN PROGRAM TO DERIVE LINEAR AIRCRAFT MODELS ROBERT F. ANTONIEWICZ, EUGENE L. DUKE, and BRIAN P. PATTERSON Sep. 1988 109 p

N88-22653*# National Aeronautics and Space Administration. Langley Research Center, Hampton, VA.
SURE RELIABILITY ANALYSIS; PROGRAM AND MATHEMATICS RICKY W. BUTLER and ALLAN L. WHITE Mar. 1987 77 p

N88-17380*# National Aeronautics and Space Administration. Langley Research Center, Hampton, VA.
SURE RELIABILITY ANALYSIS: PROGRAM AND MATHEMATICS RICKY W. BUTLER and ALLAN L. WHITE Mar. 1987 77 p

N88-17380*# National Aeronautics and Space Administration. Langley Research Center, Hampton, VA.
SURE RELIABILITY ANALYSIS: PROGRAM AND MATHEMATICS RICKY W. BUTLER and ALLAN L. WHITE Mar. 1987 77 p

N87-27474*# National Aeronautics and Space Administration. Langley Research Center, Hampton, VA.
ENGINE FAILURE, MATHEMATICAL MODELS, SPACE SHUTTLE MAIN ENGINE, SPACECRAFT RELIABILITY, STOCHASTIC PROCESSES, TEMPERATURE SENSORS
67 THEORETICAL MATHEMATICS

Includes topology and number theory.

N89-14052*# National Aeronautics and Space Administration. Goddard Space Flight Center, Greenbelt, MD.
AN ECONOMICAL SEMI-ANALYTICAL ORBIT THEORY FOR MICRO-COMPUTER APPLICATIONS
(NASA-TP-2811; REPT-86B0451; NAS 1.60:2811) Avail: NTIS HC A03/MF A01 CSCL 12A
AERODYNAMIC DRAG, COMPUTER TECHNIQUES, ORBIT CALCULATION, ORBIT PERTURBATION, ZONAL HARMONICS

70 PHYSICS (GENERAL)

N89-14053*# National Aeronautics and Space Administration. Langley Research Center, Hampton, VA.
A GENERAL FORMALISM FOR PHASE SPACE CALCULATIONS
JOHN W. NORBURY, PHILIP A. DEUTCHMAN, LAWRENCE W. TOWNSEND, and FRANCIS A. CUCINOTTA (Old Dominion Univ., Norfolk, Va.) Nov. 1988 23 p
(NSF PHY-84-11009) (NASA-TP-2843; L-16463; NAS 1.60:2843) Avail: NTIS HC A03/MF A01 CSCL 20C
GALACTIC COSMIC RAYS, NORMALITY, PHASE-SPACE INTEGRAL

71 ACOUSTICS

Includes sound generation, transmission, and attenuation.

N87-14102*# National Aeronautics and Space Administration. Langley Research Center, Hampton, VA.
EFFECTS OF BACKGROUND NOISE ON TOTAL NOISE ANNOYANCE

K. F. WILLSHIRE Jan. 1987 59 p
(NASA-TP-2630; L-16153; NAS 1.60:2630) Avail: NTIS HC A04/MF A01 CSCL 46A
BACKGROUND NOISE, EFFECTIVE PERCEIVED NOISE LEVELS, NOISE INTENSITY, NOISE POLLUTION, NOISE TOLERANCE

N87-17479*# National Aeronautics and Space Administration. Langley Research Center, Hampton, VA.
POWER CEPSTRUM TECHNIQUE WITH APPLICATION TO MODEL HELICOPTER ACOUSTIC DATA
(NASA-TP-2586; L-16070; NAS 1.60:2586) Avail: NTIS HC A04/MF A01 CSCL 20A
ACOUSTIC MEASUREMENT, CEPSTRAL ANALYSIS, HELICOPTERS, MODELS, SIGNAL REFLECTION

N87-18399*# National Aeronautics and Space Administration. Langley Research Center, Hampton, VA.
EXPERIMENTAL VALIDATION OF A TWO-DIMENSIONAL SHEAR-FLOW MODEL FOR DETERMINING ACOUSTIC IMPEDANCE
TONY L. PARROTT, WILLIE R. WATSON, and MICHAEL G. JONES (PRC Kentron, Inc., Hampton, Va.) May 1987 50 p
(NASA-TP-2678; L-16203; NAS 1.60:2678) Avail: NTIS HC A03/MF A01 CSCL 20A
ACOUSTIC IMPEDANCE, MODELS, SHEAR FLOW, TWO DIMENSIONAL FLOW, TWO DIMENSIONAL MODELS

N87-24161*# National Aeronautics and Space Administration. Langley Research Center, Hampton, VA.
MEASUREMENT OF VELOCITY AND VORTICITY FIELDS IN THE WAKE OF AN AIRFOIL IN PERIODIC PITCHING MOTION
EARL R. BOOTH, JR. Dec. 1987 31 p
(NASA-TP-2780; L-16339; NAS 1.60:2780) Avail: NTIS HC A04/MF A01 CSCL 20A
AIRFOILS, PITCH (INCLINATION), VORTICES, VORTICITY, WAKES

N88-11450*# National Aeronautics and Space Administration. Langley Research Center, Hampton, VA.
MEASUREMENT OF VELOCITY AND VORTICITY FIELDS IN THE WAKE OF AN AIRFOIL IN PERIODIC PITCHING MOTION
EARL R. BOOTH, JR. Dec. 1987 31 p
(NASA-TP-2780; L-16339; NAS 1.60:2780) Avail: NTIS HC A04/MF A01 CSCL 20A
AIRFOILS, PITCH (INCLINATION), VORTICES, VORTICITY, WAKES
The self-noise mechanisms are due to specific boundary-layer phenomena, that is, the boundary-layer turbulence passing the trailing edge, separated-boundary-layer and stalled flow over an airfoil, vortex shedding due to laminar boundary layer instabilities, vortex shedding from blunt trailing edges, and the turbulent vortex flow existing near the tip of lifting blades. The predictions are compared successfully with published data from three self-noise studies of different airfoil shapes. An application of the prediction method is reported for a large scale-model helicopter rotor, and the predictions compared well with experimental broadband noise measurements. A computer code of the method is given. Author
N87-14847*# National Aeronautics and Space Administration. 
Langley Research Center, Hampton, VA. 

DOUBLE 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 
A03/MF A01 CSCL 20H 

COLLISION PARAMETERS, GALAXIES, HEAVY IONS, PARTICLE COLLISIONS, SCATTERING CROSS SECTIONS 

N87-24977*# National Aeronautics and Space Administration. 
Langley Research Center, Hampton, VA. 

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) 

N88-13015*# National Aeronautics and Space Administration. 
Langley Research Center, Hampton, VA. 

NUCLEAR TECHNIQUES IN STUDIES OF CONDENSED MATTER 
JAG J. SINGH 
Aug. 1987 22 p 
(NASA-RP-1195; L-16361; NAS 1.61:1195) Avail: NTIS HC 
A03/MF A01 CSCL 20H 

Nuclear techniques have played an important role in the studies of materials over the past several decades. For example, X-ray diffraction, neutron diffraction, neutron activation, and particle- or photon-induced X-ray emission techniques have been used extensively for the elucidation of structural and compositional details of materials. Several new techniques have been developed recently. Four such techniques are briefly reviewed which have great potential in the study and development of new materials. Of these four, Mossbauer spectroscopy, muon spin rotation, and positron annihilation spectroscopy techniques exploit their great sensitivity to the local atomic environments in the test materials. Interest in synchrotron radiation, on the other hand, stems from its special properties, such as high intensity, high degree of polarization, and high monochromaticity. It is hoped that this brief review will stimulate interest in the exploitation of these newer techniques for the development of improved materials. Author 

N88-30402*# National Aeronautics and Space Administration. 
Langley Research Center, Hampton, VA. 

EIKONAL SOLUTIONS TO OPTICAL MODEL COUPLED-CHANNEL EQUATIONS 
FRANCIS A. CUCINOTTA, GOVIND S. KHANDELWAL, KHIN M. MAUNG (Old Dominion Univ., Norfolk, Va.), LAWRENCE W. TOWNSEND, and JOHN W. WILSON 
Nov. 1988 30 p 
(NASA-TP-2830; L-16462; NAS 1.60:2830) Avail: NTIS HC 
A03/MF A01 CSCL 20H 

EIKONAL EQUATION, ELASTIC SCATTERING, HEAVY IONS, INELASTIC SCATTERING, IONIC COLLISIONS, NUCLEAR SCATTERING, SCATTERING AMPLITUDE 

N90-14890*# National Aeronautics and Space Administration. 
Langley Research Center, Hampton, VA. 

CALCULATION OF TWO-NEUTRON MULTIPLICITY IN PHOTONUCLEAR REACTIONS 
JOHN W. NORBURY (Rider Coll., Lawrenceville, NJ.) and LAWRENCE W. TOWNSEND 
Jan. 1990 11 p 
(NASA-TP-2968; L-16610; NAS 1.60:2968) Avail: NTIS HC 
A03/MF A01 CSCL 20H 

EJECTION, EXCITATION, PARTICLE COLLISIONS, PARTICLE EMISSION, PHOTONUCLEAR REACTIONS 

74 

OPTICS 

Includes light phenomena; and optical devices. 

N87-13264*# National Aeronautics and Space Administration. 
Langley Research Center, Hampton, VA. 

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 
A03/MF A01 CSCL 20F 

BODIES OF REVOLUTION, ELECTROMAGNETIC RADIATION, MICROWAVES, REFLECTANCE, SURFACE PROPERTIES, WAVE SCATTERING 

N90-25673# National Aeronautics and Space Administration. 
Marshall Space Flight Center, Huntsville, AL. 

MODE-MEDIUM INSTABILITY AND ITS CORRECTION WITH A GAUSSIAN REFLECTIVITY MIRROR 
K. L. WEBSTER and C. C. SUNG (Alabama Univ., Huntsville.) 
Washington Jun. 1990 26 p 
(NASA-TP-3023; NAS 1.60:3023) Avail: NTIS HC 
A03/MF A01 CSCL 20F 

CARBON DIOXIDE LASERS, HIGH POWER LASERS, LASER BEAMS, LASER STABILITY, LASING, MIRRORS, REFLECTANCE 

75 

PLASMA PHYSICS 

Includes magnetohydrodynamics and plasma fusion. 

N87-10764# National Aeronautics and Space Administration. 
Langley Research Center, Hampton, VA. 

LASER-POWERED MHD GENERATORS FOR SPACE APPLICATION 
N. W. JALUFKA 
Oct. 1986 15 p 
(NASA-TP-2621; NAS 1.60:2621) Avail: NTIS HC 
A03/MF A01 CSCL 20I 

ENERGY CONVERSION EFFICIENCY, LASER PLASMA INTERACTIONS, MAGNETOHYDRODYNAMIC GENERATORS 

N87-14998*# National Aeronautics and Space Administration. 
Lewis Research Center, Cleveland, OH. 

ASYMPTOTIC ANALYSIS OF CORONA DISCHARGE FROM THIN ELECTRODES 
P. A. DURBIN 
Sep. 1986 7 p 
(NASA-TP-2645; E-3151; NAS 1.60:2645) Avail: NTIS HC 
A02/MF A01 CSCL 20I 

ASYMPTOTIC METHODS, ELECTRIC CORONA, ELECTRIC DISCHARGES, ELECTRODES 

N88-18443*# National Aeronautics and Space Administration. 
Langley Research Center, Hampton, VA. 

LASER PRODUCTION AND HEATING OF PLASMA FOR MHD APPLICATION 
N. W. JALUFKA 
Mar. 1988 11 p
This bibliography lists 653 reports, articles and other documents introduced into the NASA Scientific and Technical Information System in 1987. Items are selected and grouped according to their usefulness to the manager as manager. Citations are grouped into ten subject categories: human factors and personnel issues; management theory and techniques; industrial management and manufacturing; robotics and expert systems; computers and information management; research and development; economics, costs and markets; logistics and operations management; reliability and quality control; and legality, legislation, and policy. 

Author


HELUM ISOTOPES, LUNAR SOIL, MINING, NUCLEAR FUSION, REGOLITH

SOLID-STATE PHYSICS

Includes superconductivity.

N90-12348*# National Aeronautics and Space Administration. Lewis Research Center, Cleveland, OH. FORTRAN PROGRAM FOR X RAY PHOTOELECTRON SPECTROSCOPY DATA REFORMATTING PHILLIP B. ABEL Nov. 1989 10 p (NASA-TP-2957; E-4867; NAS 1.60:2957) Avail: NTIS HC A02/MF A01 CSCL 20L 

BINARY DATA, COMPUTER PROGRAMS, ELECTRON SPECTROSCOPY, FORMAT, FORTRAN, X RAY SPECTROSCOPY

81 ADMINISTRATION AND MANAGEMENT

Includes management planning and research.

N87-20833* National Aeronautics and Space Administration, Washington, DC. MANAGEMENT: A BIBLIOGRAPHY FOR NASA MANAGERS (SUPPLEMENT 21) Apr. 1987 70 p (NASA-SP-7500(21); NAS 1.21:7500(21)) Avail: NTIS HC A04 CSCL 05A 

This bibliography lists 664 reports, articles and other documents introduced into the NASA scientific and technical information system 1984 to 1988. Items are selected and grouped according to their usefulness to the manager as manager. Citations are grouped into ten subject categories: human factors and personnel issues; management theory and techniques; industrial management and manufacturing; robotics and expert systems; computers and information management; research and development; economics, costs and markets; logistics and operations management; reliability and quality control; and legality, legislation, and policy. 

Author

N88-21867* National Aeronautics and Space Administration, Washington, DC. MANAGEMENT: A BIBLIOGRAPHY FOR NASA MANAGERS Apr. 1988 158 p (NASA-SP-7500(22); NAS 1.21:7500(22)) Avail: NTIS HC A08 CSCL 05A 

This bibliography lists 653 reports, articles and other documents introduced into the NASA scientific and technical information system in 1987. Items are selected and grouped according to their usefulness to the manager as manager. Citations are grouped into ten subject categories: human factors and personnel issues; management theory and techniques; industrial management and manufacturing; robotics and expert systems; computers and information management; research and development; economics, costs and markets; logistics and operations management; reliability and quality control; and legality, legislation, and policy. 

Author

N90-24174* National Aeronautics and Space Administration, Washington, DC. MANAGEMENT: A BIBLIOGRAPHY FOR NASA MANAGERS Mar. 1990 190 p (NASA-SP-7500(24); NAS 1.21:7500(24)) Avail: NTIS HC A09 CSCL 05A 

This bibliography lists 755 reports, articles and other documents introduced into the NASA Scientific and Technical Information System in 1988. Items are selected and grouped according to their usefulness to the manager as manager. Citations are grouped into ten subject categories: human factors and personnel issues; management theory and techniques; industrial management and manufacturing; robotics and expert systems; computers and information management; research and development; economics, costs and markets; logistics and operations management; reliability and quality control; and legality, legislation, and policy. 

Author


This bibliography contains 253 annotated references to reports and journal articles entered into the NASA scientific and technical information database 1984 to 1988. 

Author

N90-12377*# National Aeronautics and Space Administration, Washington, DC. ISSUES IN NASA PROGRAM AND PROJECT MANAGEMENT FRANCIS T. HOBAN, ed. 1989 57 p (NASA-SP-5101(02); NAS 1.21:5101(02)) Avail: NTIS HC A04/MF A01; SOD HC $15.00 as 033-000-010-64-8 CSCL 05A 

This new collection of papers on aerospace management issues contains a history of NASA program and project management, some lessons learned in the areas of management and budget from the Space Shuttle Program, an analysis of tools needed to keep large multilayer programs organized and on track, and an update of resources for NASA managers. A wide variety of opinions and techniques are presented. 

Author

81 ADMINISTRATION AND MANAGEMENT

Includes management planning and research.


This collection of papers and resources on aerospace management issues is inspired by a desire to benefit from the lessons learned from past projects and programs. Inherent in the NASA culture is a respect for divergent viewpoints and innovative ways of doing things. This publication presents a wide variety of views and opinions. Good management is enhanced when program and project managers examine the methods of veteran managers, considering the lessons they have learned and reflected on their own guiding principles. 

Author


This collection of papers and resources on aerospace management issues is inspired by a desire to benefit from the lessons learned from past projects and programs. Inherent in the NASA culture is a respect for divergent viewpoints and innovative ways of doing things. This publication presents a wide variety of views and opinions. Good management is enhanced when program and project managers examine the methods of veteran managers, considering the lessons they have learned and reflected on their own guiding principles. 

Author
System in 1989. Items are selected and grouped according to
their usefulness to the manager as manager. Citations are grouped
into ten subject categories: human factors and personnel issues;
management theory and techniques; industrial management and
manufacturing; robotics and expert systems; computers and
information management; research and development; economics,
costs and markets; logistics and operations management; reliability
and quality control; and legality, legislation, and policy.

Author

82 DOCUMENTATION AND INFORMATION SCIENCE

Includes information management; information storage and retrieval
technology; technical writing; graphic arts; and micrography.

Author

N87-25023* National Aeronautics and Space Administration,
Washington, DC.

NASA PATENT ABSTRACTS BIBLIOGRAPHY: A CONTINUING
BIBLIOGRAPHY. SECTION 1: ABSTRACTS (SUPPLEMENT 31)
Jul. 1987 45 p
(NASA-SP-7039(31)-SECT-1; NAS 1.21:7039(31)-SECT-1) Avail:
NTIS HC A03; NTIS standing order as PB86-91100, $11.50
domestic, $23.00 foreign CSCL 05B

Abstracts are provided for 85 patents and patent applications
entered into the NASA scientific and technical information system
during the period January 1987 through June 1987. Each entry
consists of a citation, an abstract, and in most cases, a key
illustration selected from the patent or patent application.

Author

N87-26689* National Aeronautics and Space Administration,
Washington, DC.

NASA PATENT ABSTRACTS BIBLIOGRAPHY: A CONTINUING
BIBLIOGRAPHY. SECTION 2: INDEXES (SUPPLEMENT 31)
Jul. 1987 493 p
(NASA-SP-7039(31)-SECT-2; NAS 1.21:7039(31)-SECT-2) Avail:
NTIS HC A21 CSCL 05B

A subject index is provided for over 4600 patents and patent
applications for the period May 1969 through June 1987. Additional
indexes list personal authors, corporate authors, contract numbers,
NASA case numbers, U.S. patent class numbers, and NASA
accession numbers.

Author

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

NASA THESAURUS SUPPLEMENT: A FOUR PART
CUMULATIVE SUPPLEMENT TO THE 1985 EDITION OF THE
NASA THESAURUS (SUPPLEMENT 3)
Jul. 1987 325 p
(NASA-SP-7053-SUPPL-3; NAS 1.21:7053-SUPPL-3) Avail: NTIS
HC A14 CSCL 05B

The four part cumulative NASA Thesaurus Supplement to the
1985 edition of the NASA Thesaurus includes Part 1, Hierarchical
Listing, Part 2, Access Vocabulary, Part 3, NASA Thesaurus
Definitions, and Part 4, Changes. The semianual supplement gives
complete hierarchies for new terms.

Author

N87-30218*# National Aeronautics and Space Administration,
Washington, DC.

NASA SCIENTIFIC AND TECHNICAL PUBLICATIONS: A
CATALOG OF SPECIAL PUBLICATIONS, REFERENCE
PUBLICATIONS, CONFERENCE PUBLICATIONS, AND
TECHNICAL PAPERS, 1977-1986
Sep. 1987 390 p
(NASA-SP-7063(01); NAS 1.21:7063(01)) Avail: NTIS HC free as
PR-655B; NASA Scientific and Technical Information Facility, P.O.
Box 8757, BWI Airport, Md. 21240 HC free CSCL 05B

This catalog lists 2311 citations of all NASA Special Publications,
NASA Reference Publications, NASA Conference Publications, and
NASA Technical Papers that were entered into the NASA scientific
and technical database during the decade 1977 through 1986.
The entries are grouped by subject category. Indexes of subject
terms, personal authors, and NASA report numbers are provided.

Author

N88-15732* National Aeronautics and Space Administration,
Washington, DC.

NASA PATENT ABSTRACTS BIBLIOGRAPHY: A CONTINUING
BIBLIOGRAPHY. SECTION 1: ABSTRACTS (SUPPLEMENT 32)
Jan. 1988 61 p
(NASA-SP-7039(32)-SECT-1; NAS 1.21:7039(32)-SECT-1) Avail:
NTIS HC A04; NTIS standing order as PB 88-91100, $12.50
domestic, $25.00 foreign CSCL 05B

Abstracts are provided for 136 patents and patent applications
entered into the NASA scientific and technical information system
during the period July through December 1987. Each entry consists
of a citation, an abstract, and in most cases, a key illustration
selected from the patent or patent application.

Author

N88-18511* National Aeronautics and Space Administration,
Washington, DC.

NASA PATENT ABSTRACTS BIBLIOGRAPHY: A CONTINUING
BIBLIOGRAPHY. SECTION 2: INDEXES (SUPPLEMENT 32)
Jan. 1988 499 p
(NASA-SP-7039(32)-SECT-2; NAS 1.21:7039(32)-SECT-2) Avail:
NTIS HC A21; NTIS standing order as PB88-91100, $26.50
domestic, $53.00 foreign CSCL 05B

A subject index is provided for over 4700 patents and patent
applications for the period May 1969 through December 1987.
Additional indexes list personal authors, corporate authors, contract
numbers, NASA case numbers, U.S. patent class numbers, U.S.
patent numbers, and NASA accession numbers.

Author

N88-22830*# National Aeronautics and Space Administration,
Washington, DC.

NASA SCIENTIFIC AND TECHNICAL PUBLICATIONS: A
CATALOG OF SPECIAL PUBLICATIONS, REFERENCE
PUBLICATIONS, CONFERENCE PUBLICATIONS, AND
TECHNICAL PAPERS, 1987
Mar. 1988 69 p
(NASA-SP-7063(02); NAS 1.21:7063(02)) Avail: NTIS HC free as
PR-826; NASA Scientific and Technical Information Facility, P.O.
Box 8757, BWI Airport, Md. 21240 HC free CSCL 05B

This catalog lists 239 citations of all NASA Special Publications,
NASA Reference Publications, NASA Conference Publications, and
NASA Technical Papers that were entered in the NASA scientific
and technical information database during accession year 1987.
The entries are grouped by subject category. Indexes of subject
terms, personal authors, and NASA report numbers are provided.

Author

N89-13301*# National Aeronautics and Space Administration,
Washington, DC.

NASA THESAURUS. VOLUME 3: DEFINITIONS
Jul. 1988 148 p
(NASA-SP-7064-VAL-3; NAS 1.21:7064-VAL-3) Avail: NTIS HC
A07 CSCL 05B

Publication of NASA Thesaurus definitions began with
Supplement 1 to the 1985 NASA Thesaurus. The definitions given
here represent the complete file of over 3,200 definitions,
complemented by nearly 1,000 use references. Definitions of more
common or general scientific terms are given a NASA slant if one
exists. Certain terms are not defined as a matter of policy: common
names, chemical elements, specific models of computers, and
nontechnical terms. The NASA Thesaurus predates by a number
of years the systematic effort to define terms, therefore not all
Thesaurus terms have been defined. Nevertheless, definitions of
older terms are continually being added. The following data are
provided for each entry: term in uppercase/lowercase form,
definition, source, and year the term (not the definition) was added
to the NASA Thesaurus. The NASA History Office is the authority
for capitalization in satellite and spacecraft names. Definitions with
no source given were constructed by lexicographers at the NASA

Author

70
Scientific and Technical Information (STI) Facility who rely on the following sources for their information: experts in the field, literature searches from the NASA STI database, and specialized references.

Author

N89-15779# National Aeronautics and Space Administration, Washington, DC.

THE NASA SCIENTIFIC AND TECHNICAL INFORMATION SYSTEM: ITS SCOPE AND COVERAGE
Dec. 1988 216 p
(NASA-SP-7065; NAS 1.21:7065) Avail: NTIS HC A10/MF A02 CSCL 05B
A general description of the subject areas covered in the NASA scientific and technical information system is presented. In addition, it establishes subject-based selection criteria for guiding decisions related to the addition of new documents to the NASA collection.

Author

N89-25775* National Aeronautics and Space Administration, Washington, DC.

NASA PATENT ABSTRACTS BIBLIOGRAPHY: A CONTINUING BIBLIOGRAPHY. SECTION 1: ABSTRACTS (SUPPLEMENT 35)
Jun. 1989 38 p
(NASA-SP-7039(35)-SECT-1; NAS 1.21:7039(35)-SECT-1) Avail: NTIS HC A03; NTIS standing order as PB89-911100, $13.75 domestic, $27.50 foreign CSCL 05B
Abstracts are provided for 58 patents and patent applications entered into the NASA scientific and technical information systems during the period January 1989 through June 1989. Each entry consists of a citation, an abstract, and in most cases, a key illustration selected from the patent or patent application.

Author

N89-29264* National Aeronautics and Space Administration, Washington, DC.

NASA PATENT ABSTRACTS BIBLIOGRAPHY: A CONTINUING BIBLIOGRAPHY. SECTION 2: INDEXES (SUPPLEMENT 35)
Jan. 1989 512 p
(NASA-SP-7039(35)-SECT-2; NAS 1.21:7039(35)-SECT-2) Avail: NTIS HC A22; NTIS standing order as PB89-911100, $29.00 domestic, $56.00 foreign CSCL 05B
A subject index is provided for over 4600 patents and patent applications for the period May 1969 through June 1989. Additional indexes list personal authors, corporate authors, contract numbers, NASA case numbers, U.S. patent class numbers, U.S. patent numbers, and NASA accession numbers.

Author

N90-10782# National Aeronautics and Space Administration, Washington, DC.

NASA SCIENTIFIC AND TECHNICAL PUBLICATIONS: A CATALOG OF SPECIAL PUBLICATIONS, CONFERENCE PUBLICATIONS, AND TECHNICAL PAPERS, 1988
Feb. 1989 57 p
(NASA-SP-7063(03); NAS 1.21:7063(03)) Avail: NTIS HC free as PR-849; NASA Scientific and Technical Information Facility, BWI Airport, MD free CSCL 05B
This catalog lists 179 citations of all NASA Special Publications, NASA Reference Publications, NASA Conference Publications, and NASA Technical Papers that were entered into the NASA scientific and technical information database during accession year 1988. The entries are grouped by subject category. Indexes of subject terms, personal authors, and NASA report numbers are provided.

Author

N90-22438# National Aeronautics and Space Administration, Washington, DC.

Mar. 1989 33 p
(NASA-SP-7064-SUPPL-3; NAS 1.21:7064-SUPPL-3) Avail: NTIS HC A03/MF A01 CSCL 05B
The four-part cumulative supplement to the 1988 edition of the NASA Thesaurus includes the Hierarchical Listing (Part 1), Access Vocabulary (Part 2), Definitions (Part 3), and Changes (Part 4). The semiannual supplement gives complete hierarchies and accepted upper/lowercase forms for new terms.

Author

N90-25698* National Aeronautics and Space Administration, Washington, DC.

NASA PATENT ABSTRACTS BIBLIOGRAPHY: A CONTINUING BIBLIOGRAPHY. SECTION 1: ABSTRACTS (SUPPLEMENT 37)
Jan. 1989 43 p
(NASA-SP-7039(37)-SECT-1; NAS 1.21:7039(37)-SECT-1) Avail: NTIS HC A04; NTIS standing order as PB89-911100, $15.00 domestic, $30.00 foreign CSCL 05B
Abstracts are provided for 76 patents and patent applications entered into the NASA scientific and technical information systems during the period January 1990 through June 1990. Each entry consists of a citation, an abstract, and in most cases, a key illustration selected from the patent or patent application.

Author

N90-26700* National Aeronautics and Space Administration, Washington, DC.

NASA PATENT ABSTRACTS BIBLIOGRAPHY: A CONTINUING BIBLIOGRAPHY. SECTION 2: INDEXES (SUPPLEMENT 37)
Jan. 1989 507 p
(NASA-SP-7039(37)-SECT-2; NAS 1.21:7039(37)-SECT-2) Avail: NTIS HC A22; NTIS standing order as PB89-911100, $32.00 domestic, $64.00 foreign CSCL 05B
A subject index is provided for over 4600 patents and patent applications for the period May 1989 through June 1990. Additional indexes list personal authors, corporate authors, contract numbers, NASA case numbers, U.S. patent class numbers, U.S. patent numbers, and NASA accession numbers.

Author

N90-26710# National Aeronautics and Space Administration. Langley Research Center, Hampton, VA.

GRAMMAR, PUNCTUATION, AND CAPITALIZATION: A HANDBOOK FOR TECHNICAL WRITERS AND EDITORS
MARY K. MCCASKILL Washington 1990 112 p
(NASA-SP-7084; L-16617: NAS 1.21:7084) Avail: NTIS HC A06/MF A01 CSCL 05B
Writing problems are addressed which are often encountered in technical documents and preferences are indicated (Langley's) when authorities do not agree. It is directed toward professional writers, editors, and proofreaders. Those whose profession lies in other areas (for example, research or management), but who have occasion to write or review others' writing will also find this information useful. A functional attitude toward grammar and punctuation is presented. Chapter 1 on grammar presents grammatical problems related to each part of speech. Chapter 2 on sentence structure concerns syntax, that is, effective arrangement of words, with emphasis on methods of revision to improve writing effectiveness. Chapter 3 addresses punctuation marks, presenting their function, situations when they are required or incorrect, and situations when they are appropriate but optional. Chapter 4 presents capitalization, which is mostly a matter of editorial style and preference rather than a matter of generally accepted rules. An index and glossary are included.

Author

N90-27548# National Aeronautics and Space Administration, Washington, DC.

INFORMATION RESOURCES MANAGEMENT, 1984-1989: A BIBLIOGRAPHY WITH INDEXES
May 1990 202 p
(NASA-SP-7079; NAS 1.21:7079) Avail: NTIS HC A10 CSCL 05B
This bibliography contains 768 annotated references to reports and journal articles entered into the NASA scientific and technical information database 1984 to 1989.
LAW, POLITICAL SCIENCE AND SPACE POLICY

84

Includes NASA appropriation hearings; aviation law; space law and policy; international law; international cooperation; and patent policy.

N88-19375*# National Aeronautics and Space Administration, Washington, DC.

SPACELAB: AN INTERNATIONAL SUCCESS STORY
DOUGLAS R. LORD (Science Applications International Corp., Washington, D.C.) 1987 565 p Original contains color illustrations; Avail: NTIS HC A24/MF A03 CSCL 05D

Spacecab is a European-developed and U.S.-operated space laboratory carried in the cargo bay of the Space Shuttle Orbiter. This story of the Spacelab Development Program traces the program from the origin of the Spacelab concept, describing negotiations and agreements for European participation and the role of Europe and the United States in system development, operational capability development, and utilization planning. It also considers the joint management structure, coordination, and experience in solving management and technical interface problems. The book is not an exhaustive historical treatise, but an informative and readable story of the evolution and technical accomplishments of this unique program in manned space flight and of some of the unusual political and human interest aspects of the program from the viewpoint of one of the key participants.

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, DC.

SIGNIFICANT NASA INVENTIONS. AVAILABLE FOR LICENSING IN FOREIGN COUNTRIES
1977 103 p (NASA-SP-7038(04); NAS 1.21:7038(04)) Avail: NTIS HC A05/MF A01 CSCL 05B

88

SPACE SCIENCES (GENERAL)

N87-23313*# National Aeronautics and Space Administration. Marshall Space Flight Center, Huntsville, AL.

DOUBLE LAYERS IN ASTROPHYSICS

CONFERENCES, ELECTRIC FIELDS, ENERGY TRANSFER, MATHEMATICAL MODELS, PLASMA LAYERS, PLASMA PHYSICS, SPACE PLASMAS

N87-24247*# National Aeronautics and Space Administration. Goddard Space Flight Center, Greenbelt, MD.

ESSAYS IN SPACE SCIENCE

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

N87-28471*# National Aeronautics and Space Administration. Langley Research Center, Hampton, VA.

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-16218; NAS 1.60:2670) Avail: NTIS HC A03/MF A01 CSCL 03B

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

N88-25390*# National Aeronautics and Space Administration. Langley Research Center, Hampton, VA.

A STUDY OF SPACE STATION CONTAMINATION EFFECTS

CONFERENCES, CONTAMINANTS, EARTH ORBITAL ENVIRONMENTS, SPACE STATIONS, SPACECRAFT CONTAMINATION

N89-14188*# National Aeronautics and Space Administration. Lyndon B. Johnson Space Center, Houston, TX.

REPORT OF THE IN SITU RESOURCES UTILIZATION WORKSHOP

LUNAR EXPLORATION, SPACE COMMERCIALIZATION, SPACE HABITATS, TECHNOLOGY ASSESSMENT

N89-14169*# National Aeronautics and Space Administration. Lyndon B. Johnson Space Center, Houston, TX.

REMOTE SENSING IN POLARIZED LIGHT

CAMERAS, EARTH OBSERVATIONS (FROM SPACE), IMAGING TECHNIQUES, POLARIZATION (WAVES), RADIATIVE TRANSFER, SPACE SHUTTLE PAYLOADS

N89-14998*# National Aeronautics and Space Administration. Lyndon B. Johnson Space Center, Houston, TX.

EXPERIMENTS IN PLANETARY AND RELATED SCIENCES AND THE SPACE STATION
ASTROPHYSICS, CONFERENCES, INTERSTELLAR CHEMISTRY, PARTICLE INTERACTIONS, ROBOTICS, SPACE STATION PAYLOADS, SPACEBORNE EXPERIMENTS

N89-15790*# National Aeronautics and Space Administration. Marshall Space Flight Center, Huntsville, AL.

SPACE STATION INDUCED MONITORING
AEROSPACE ENVIRONMENTS, ENVIRONMENTAL MONITORING, SPACE STATIONS, SPACECRAFT CHARGING

N90-18329*# National Aeronautics and Space Administration. Marshall Space Flight Center, Huntsville, AL.

SOLAR-TERRESTRIAL SCIENCE STRATEGY WORKSHOP
CONFERENCES, MISSION PLANNING, NASA PROGRAMS, SOLAR TERRESTRIAL INTERACTIONS, SPACEBORNE EXPERIMENTS, STRATEGY, TECHNOLOGY ASSESSMENT

N90-27562*# National Aeronautics and Space Administration. Ames Research Center, Moffett Field, CA.

CARBON IN THE GALAXY: STUDIES FROM EARTH AND SPACE
CARBON, COMETS, CONFERENCES, INTERPLANETARY DUST, INTERSTELLAR CHEMISTRY, METEORITIC DIAMINDS, MILKY WAY GALAXY

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-CP-1176; NAS 1.61:1176; REPT-86B0471) Avail: NTIS HC A11/MF A02 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 ephemerides. Author

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

INFRARED SOURCE CROSS-INDEX, FIRST EDITION
MARION SCHMITZ (Computer Sciences Corp., Beltsville, Md.), JAYLEE M. MEAD, and DANIEL Y. GEZARI Apr. 1987 323 p (NASA-CP-1182; REPT-87B0058; NAS 1.61:1182) Avail: NTIS HC A14/MF A02 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 1118), 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

N87-24266*# National Aeronautics and Space Administration, Washington, DC.

STAR FORMATION IN GALAXIES
CONFERENCES, GALACTIC STRUCTURE, GALAXIES, INFRARED ASTRONOMY, MOLECULAR CLOUDS, RADIO ASTRONOMY, STAR FORMATION, STELLAR LUMINOSITY

N87-25906*# National Aeronautics and Space Administration. Goddard Space Flight Center, Greenbelt, MD.

FIFTY YEAR CANON OF SOLAR ECLIPSES: 1986 - 2035
FRED ESPENAK Jul. 1987 272 p (NASA-CP-1178-REV; REPT-87B0252; NAS 1.61:1178-REV) Avail: NTIS HC A12/MF A02 CSCL 03A
A complete catalog is presented, listing the general characteristics of every solar eclipse from 1901 through 2100. To complement this catalog, a detailed set of cylindrical projection world maps shows the umbral paths of every solar eclipse over the 200 year interval. Focusing in on the next 50 years, accurate geodetic path coordinates and local circumstances for the 71 central eclipses from 1987 through 2035 are tabulated. Finally, the geodetic paths of the umbral and penumbral shadows of all 109 solar eclipses in this period are plotted on orthographic projection maps of the Earth. Appendices are included which discuss eclipse geometry, eclipse frequency and occurrence, modern eclipse prediction and time determination. Finally, code for a simple Fortran program is given to predict the occurrence and characteristics of solar eclipses. Author

N88-15738*# National Aeronautics and Space Administration. Goddard Space Flight Center, Greenbelt, MD.

CATALOG OF INFRARED OBSERVATIONS. PART 1: DATA
Second Edition
The Catalog of Infrared Observations (CIO) is a compilation of infrared astronomical observational data obtained from an extensive literature search of astronomical journals and major astronomical catalogs and surveys. The literature searches are complete for 1985 through 1986 in this Second Edition. The Catalog is published in two parts, with the observational data (roughly 200,000 observations of 20,000 individual sources) listed in Part I, and supporting appendices in Part II. The expanded Second Edition contains a new feature: complete IRAS 4-band data for all CIO sources. Author

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-CP-1176; NAS 1.61:1176; REPT-86B0471) Avail: NTIS HC A11/MF A02 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 ephemerides. Author

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

INFRARED SOURCE CROSS-INDEX, FIRST EDITION
MARION SCHMITZ (Computer Sciences Corp., Beltsville, Md.), JAYLEE M. MEAD, and DANIEL Y. GEZARI Apr. 1987 323 p (NASA-CP-1182; REPT-87B0058; NAS 1.61:1182) Avail: NTIS HC A14/MF A02 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 1118), 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
The Catalog of Infrared Observations (CIO) is a compilation of infrared astronomical observational data obtained from an extensive literature search of astronomical journals and major astronomical catalogs and surveys. The literature searches are complete for years 1965 to 1986. Supporting appendices are published in this part. The appendices include an atlas of infrared source positions, two bibliographies of infrared literature upon which the search was based, and, keyed to the main Catalog listings (organized alphabetically by first author, and by date), an atlas of infrared spectral ranges, and IRAS data for the CIO sources. The complete CIO database is available to qualified users in printed microfiche and magnetic tape formats.

O STARS AND WOLF-RAYET STARS

Basic information is given about O and Wolf-Rayet stars; the intrinsic parameters of luminosity, effective temperature, mass, and composition of the stars, and a discussion of their viability; stellar wind properties; and the related issues concerning the efforts of stellar radiation and wind on the immediate interstellar environment are presented.

A critical first step in determining distances to galaxies is to measure some property of primary objects such as stars of specific types, H II regions, and supernovae remnants that are resolved out of the general galactic star content. With the completion of the Mount Wilson/Palomar/Las Campanas survey of bright galaxies in 1985, excellent large-scale photographs of the complete Shapley-Ames sample were on hand. Most of the galaxies useful for distance scale calibration are in this collection. This atlas contains photographs of 322 galaxies including the majority of all Shapley-Ames bright galaxies, plus cluster members in the Virgo Cluster core that might be usefully resolved by the Hubble Space Telescope (HST). Because of crowding and high background-disk surface brightness, the choice of field position is crucial for programs involving resolution of particular galaxies into stars. The purpose of this atlas is to facilitate this choice. Enough information is given herein (coordinates of the galaxy centers and the scale of the photography) to allow optimum placement of the HST wide-field planetary camera format of approximately 150 arc-seconds on a side.
A LUNAR FAR-SIDE VERY LOW FREQUENCY ARRAY


A bibliographic guide is presented to publications of spatial interferometry techniques applied to optical astronomy. Listings appear in alphabetical order, by first author, as well as in specific subject categories listed in chronological order, including imaging theory and speckle interferometry, experimental techniques, and observational results of astronomical studies of stars, the Sun, and the solar system. Author

FIFTY YEAR CANON OF LUNAR ECLIPSES: 1986-2035

FRED ESPENAK N90-18342*# National Aeronautics and Space Administration, Goddard Space Flight Center, Greenbelt, MD. 221 p Prepared in cooperation with CNRS, Paris, France Its Monograph Series on Nonthermal Phenomena in Stellar Atmospheres, Volume 5 (NASA-SP-492; NAS 1.13:492; LC-87-11340) Avail: SOD HC $26.00 as 033-000-01007-9; NTIS MF A01 CSCL 03B

The papers in this volume cover the following topics: (1) basic properties and photometric variability of M and related stars; (2) spectroscopy and nonthermal processes; (3) circumstellar radio molecular lines; (4) circumstellar shells, the formation of grains, and radiation transfer; (5) mass loss; (6) circumstellar chemistry; (7) thermal atmospheric models; (8) quasi-thermal models; (9) observations on the atmospheres of M dwarfs; and (10) theoretical work on M dwarfs. For individual titles, see N88-11592 through N88-11602.

THE M-TYPE STARS


With the impending return of Halley's Comet in 1986, a major effort began to collect the material obtained at its last appearance in 1910. This material displays the evolving coma and tail phenomena, and is useful for comparison with the present quantitative studies of spectroscopic and structural phenomena. Images in the atlas are arranged in chronological order by day. Days that have multiple images with varying scale are arranged in two sequences. Photographs showing tail phenomena are first, followed by photographs obtained with longer focus instruments showing the head or near-nuclear region. Drawings of Comet Halley, made from visual observations in 1835 and 1910, also are included. B.G.

SPATIAL INTERFEROMETRY IN OPTICAL ASTRONOMY

DANIEL Y. GEZARI, FRANCOIS RODDIER, and CLAUDE RODDIER (Hawaii Univ., Honolulu.) Washington Sep. 1990

The papers in this volume cover the following topics: (1) basic properties and photometric variability of M and related stars; (2) spectroscopy and nonthermal processes; (3) circumstellar radio molecular lines; (4) circumstellar shells, the formation of grains, and radiation transfer; (5) mass loss; (6) circumstellar chemistry; (7) thermal atmospheric models; (8) quasi-thermal models; (9) observations on the atmospheres of M dwarfs; and (10) theoretical work on M dwarfs. For individual titles, see N88-11592 through N88-11602.
90 ASTROPHYSICS

REFLECTOR, LARGE SPACE STRUCTURES, REFLECTORS, TECHNOLOGY ASSESSMENT


The International Ultraviolet Explorer (IUE) archives contain a wealth of information on high quality ultraviolet spectra of approximately 180 planetary nebulae, their central stars, and related objects. Selected are representative low-dispersion IUE spectra in the range 1200 to 3200 Å for 177 objects arranged by Right Ascension (RA) for this atlas. For most entries, the combined short wavelength (SWP) (1200 to 1900 Å) and long wavelength (LWP) (or LWP, 1900 to 3200 Å) regions are shown on 30 cm by 10 cm Calcomp plots on a uniform scale to facilitate intercomparison of the spectra. Each calibrated spectrum is also shown on an expanded vertical scale to bring out some of the weaker features.

Author


The Catalog of Open Clusters and Associated Interstellar Matter summarizes observations of 128 open clusters and their associated ionized, atomic, and molecular interstellar matter. Cluster sizes, distances, radial velocities, ages, and masses, and the radial velocities and masses of associated interstellar medium components, are given. The database contains information from approximately 400 references published in the scientific literature before 1988.

Author


The Infrared Astronomical Satellite (IRAS) was launched on January 26, 1983. During its 300-day mission, IRAS surveyed over 96 pcts of the celestial sphere at four infrared wavelengths, centered approximately at 12, 25, 60, and 100 microns. Volume 1 describes the instrument, the mission, and data reduction.

Author


The Infrared Astronomical Satellite (IRAS) was launched January 26, 1983. During its 300-day mission, IRAS surveyed over 96 pcts of the celestial sphere at four infrared wavelengths, centered approximately at 12, 25, 60, and 100 microns. This is Volume 5, The Point Source Catalog Declination Range -30 deg greater than delta greater than -50 deg.

Author


The Infrared Astronomical Satellite (IRAS) was launched 26 January 1983. During its 300-day mission, it surveyed over 96 pcts of the celestial sphere at four infrared wavelengths, centered approximately at 12, 25, 60, and 100 microns. This is Volume 4, The Point Source Catalog Declination Range 0 deg greater than delta greater than -30 deg.

Author


The Infrared Astronomical Satellite (IRAS) was launched January 26, 1983. During its 300-day mission, IRAS surveyed 96 pcts of the celestial sphere at four infrared wavelengths, centered approximately at 12, 25, 60, and 100 microns. This is Volume 2. The Point Source Catalog Declination Range 90 deg greater than delta greater than 30 deg.

Author


The Infrared Astronomical Satellite (IRAS) was launched January 26, 1983. During its 300-day mission, IRAS surveyed 96 pcts of the celestial sphere at four infrared wavelengths, centered approximately at 12, 25, 60, and 100 microns. This is Volume 6. The Point Source Catalog Declination Range -50 deg greater than delta greater than -90 deg.

Author

Washington
(NASA-RP-1190-VOL-7; NAS 1.61:1190-VOL-7) Avail: NTIS HC A15/MF A02; also available SOD CSCL 03B

The Infrared Astronomical Satellite (IRAS) was launched January 26, 1983. During its 300-day mission, it surveyed over 96 pet of the celestial sphere at four infrared wavelengths, centered approximately at 12, 25, 60, and 100 microns. Volume 1 describes the instrument, the mission, and the data reduction process. Volumes 2 through 6 present the observations of the approximately 245,000 individual point sources detected by IRAS; each volume gives sources within a specified range of declination. Volume 7 gives the observations of the approximately 16,000 sources spatially resolved by IRAS and smaller than 6'. This is Volume 7, The Small Scale Structure Catalog. Author

N89-14201*# Jet Propulsion Lab., California Inst. of Tech., Pasadena.
INFRARED ASTRONOMICAL SATELLITE (IRAS) CATALOGS AND ATLASES. VOLUME 3: THE POINT SOURCE CATALOG DECLINATION RANGE 30 DEG GREATER THAN DELTA GREATER THAN 0 DEG
(NASA-RP-1190-VOL-3; NAS 1.61:1190-VOL-3) Avail: NTIS HC A21/MF A03; also available SOD CSCL 03B

The Infrared Astronomical Satellite (IRAS) was launched January 26, 1983. During its 300-day mission, IRAS surveyed over 96 pet of the celestial sphere at four infrared wavelengths, centered approximately at 12, 25, 60, and 100 microns. This is Volume 3, The Point Source Catalog Declination Range 30 deg greater than delta greater than 0 deg. Author

N89-27612*# National Aeronautics and Space Administration. Goddard Space Flight Center, Greenbelt, MD.
COMMENTARY ON INTERSTELLAR MATTER ASSOCIATED WITH 18 OPEN CLUSTERS
DAVID LEISAWITZ Washington Sep. 1989 20 p Sponsored by National Research Council
(R033-87; NSF AST-81-6403; NSF AST-83-12332)
(NASA-RP-1229; REPT-88600238; NAS 1.61:1229) Avail: NTIS HC A03/MF A01 CSCL 03B

Information supplementary to that contained in Section 4 of an article entitled, A CO Survey of Regions Around 34 Open Clusters, (Leisawitz, Bash, and Thaddeus) published in the Astrophysical Journal Supplement Series, Volume 70, Number 4, August 1989 is summarized. The information presented here, which describes the interstellar environments of young clusters and some cluster physical characteristics, comes from observations published in the astronomical literature and the author's carbon monoxide (CO) emission line survey, and may help clarify our understanding of the interaction of massive stars with the interstellar medium. Author

N87-18344*# National Aeronautics and Space Administration, Washington, DC.
FGK STARS AND T TAURI STARS: MONOGRAPH SERIES ON NONTHERMAL PHENOMENA IN STELLAR ATMOSPHERES
LAWRENCE E. CRAM, ed. and LEONARD V. KUHI, ed. (California Univ., Berkeley.) 1989 353 p Prepared in cooperation with Centre National de la Recherche Scientifique, Paris, France
(NASA-SP-502; NAS 1.21:502; LC-88-000317) Avail: NTIS HC A18/MF A02; also available SOD HC $16.00 as 033-000-0170-7 CSCL 03B

The purpose of this book, FGK Stars and T Tauri Stars, like all other volumes of this series, is to exhibit and describe the best space data and ground based data currently available, and also to describe and critically evaluate the status of current theoretical models and physical mechanisms that have been proposed to interpret these data. The method for obtaining this book was to collect manuscripts from competent volunteer authors, and then to collate and edit these contributions to form a well structured book, which will be distributed to an international community of research astronomers by NASA and by the French CNRS. Author

N90-19940*# National Aeronautics and Space Administration, Washington, DC.
RELATIVISTIC GRAVITATIONAL EXPERIMENTS IN SPACE
(NASA-CP-3046; NAS 1.55:3046) Avail: NTIS HC A11/MF A02 CSCL 03B
BLACK HOLES (ASTRONOMY), GRAVITATIONAL WAVES, RELATIVITY, SPACEBORNE EXPERIMENTS

N90-23294*# National Aeronautics and Space Administration. Goddard Space Flight Center, Greenbelt, MD.
THE ENERGETIC GAMMA-RAY EXPERIMENT TELESCOPE (EGRET) SCIENCE SYMPOSIUM
(NASA-CP-3071; NAS 1.55:3071) Avail: NTIS HC A15/MF A02; 1 functional color page CSCL 03B
CONFERENCES, GALLAXIES, COSMIC RAYS, GALACTIC RADIATION, GALACTIC STRUCTURE, GAMMA RAY ASTRONOMY, GAMMA RAY OBSERVATORY, GAMMA RAY TELESCOPES

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LUNAR AND PLANETARY EXPLORATION
Includes planetology; and manned and unmanned flights.

THE JOVIAN ATMOSPHERES
MICHAEL ALLISON, ed. and LARRY D. TRAVIS, ed. Oct. 1986 129 p Conference held in New York, N.Y., 6-8 May 1985 Submitted for publication
(NASA-CP-2441; NAS 1.55:2441) Copyright Avail: NTIS HC A07/MF A01 CSCL 84B
ATMOSPHERIC CHEMISTRY, CLOUDS (METEOROLOGY), GAS DYNAMICS, GAS GIANT PLANETS, HYDROGEN, JUPITER ATMOSPHERE, NEPTUNE ATMOSPHERE, SATURN ATMOSPHERE, SPACE EXPLORATION, SYNTHETIC METEOROLOGY, THERMODYNAMICS, URANUS ATMOSPHERE

N87-19322*# National Aeronautics and Space Administration, Washington, DC.
STATUS AND FUTURE OF LUNAR GEOSCIENCE
1986 63 p
(NASA-SP-484; NAS 1.21:484) Avail: SOD HC $4.25 as 033-000-0099-7; NTIS MF A01 CSCL 03B

The Moon is of special interest among the many and diverse bodies of the solar system because it serves as a scientific baseline for understanding the terrestrial planets, its origin is closely tied to the early history of the Earth, and its proximity permits a variety of space applications such as mining and establishment of bases and colonies. Data acquisition and analysis have enabled advances to be made and the remaining questions in many fields of lunar geoscience to be identified. The status and unresolved problems of lunar science are discussed. Immediate needs, new unmanned missions, and a return to the Moon (a lunar base) are examined. B.G.
TIME-VARIABLE PHENOMENA IN THE JOVIAN SYSTEM

THOMAS B. MCCORD, ed. (Hawaii Univ., Honolulu.) Jun. 1987 43 p
(NASA-SP-493; NAS 1.21:493; LC-88-2516) Avail: NTIS HC A03/MF A01 CSCL 03B

Reflectance spectroscopy is a remote sensing technique used to study the surfaces and atmospheres of solar system bodies. It provides first-order information on the presence and amounts of certain ions, molecules, and minerals on a surface or in an atmosphere. Reflectance spectroscopy has become one of the most important investigations conducted on most current and planned NASA Solar System Exploration Program space missions. This book reviews the field of reflectance spectroscopy, including information on the scientific technique, contributions, present conditions, and future directions and needs.

Author

THE CASSINI MISSION: INFRARED AND MICROWAVE SPECTROSCOPIC MEASUREMENTS

V. G. KUNDE Jan. 1989 127 p
(NASA-CP-3050; NAS 1.55:3005) Avail: NTIS HC A03/MF A01 CSCL 03B

PLANETARY GEOLOGY, PLANETOLOGY, SPACE EXPLORATION

N98-16709*# National Aeronautics and Space Administration. Goddard Space Flight Center, Greenbelt, MD.

THE CASSINI MISSION: INFRARED AND MICROWAVE SPECTROSCOPIC MEASUREMENTS

The Cassini Orbiter and Titan Probe model payloads include a number of infrared and microwave instruments. This document describes: (1) the fundamental scientific objectives for Saturn and Titan which can be addressed by infrared and microwave instrumentation, (2) the instrument requirements and the accompanying instruments, and (3) the synergism resulting from the comprehensive coverage of the total infrared and microwave spectrum by the complement of individual instruments. The baseline consists of four instruments on the orbiter and two on the Titan probe. The orbiter infrared instruments are: (1) a microwave spectrometer and radiometer; (2) a far to mid-infrared spectrometer; (3) a pressure modulation gas correlation spectrometer; and (4) a near-infrared grating spectrometer. The two Titan probe infrared instruments are: (1) a near-infrared instrument, and (2) a tunable diode laser infrared absorption spectrometer and nephelometer.

Author

N98-25030*# National Aeronautics and Space Administration. Lyndon B. Johnson Space Center, Houston, TX.

N98-26744*# National Aeronautics and Space Administration. Goddard Space Flight Center, Greenbelt, MD.

FIRST INTERNATIONAL CONFERENCE ON LABORATORY RESEARCH FOR PLANETARY ATMOSPHERES

N98-27607*# Arizona State Univ., Tempe. Dept. of Geology.

MARS LANDING SITE CATALOG

(NAGW-1306) (NASA-SP-1238; NAS 1.61:1238) Avail: NTIS HC A10/MF A02 CSCL 03B

The catalog was compiled from material provided by the planetary community for areas on Mars that are of potential interest for future exploration. The catalog has been edited for consistency informal as practical; however, the proposed scientific objectives and characteristics have not been reviewed. This is a working catalog that is being revised, updated, and expanded continually.

Author
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**SOLAR PHYSICS**

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

**CONFERENCES, MAGNETOHYDRODYNAMIC STABILITY, SOLAR CORONA, SOLAR FLARES, SOLAR MAGNETIC FIELD, SOLAR MAXIMUM MISSION, SOLAR PHYSICS, SOLAR PROMINENCES, SUN, SUNSPOTS**

**CONFERENCES, MAGNETIC FIELD CONFIGURATIONS, MAGNETOHYDRODYNAMIC STABILITY, MAGNETOSTATICS, PLASMAS (PHYSICS), RADIO ASTRONOMY, SOLAR ATMOSPHERE, SOLAR CORONA, SOLAR MAGNETIC FIELD, SOLAR PHYSICS, SOLAR PROMINENCES, SUN**

**SOLAR FLARES, SOLAR PROMINENCES, STATISTICAL ANALYSIS**

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

**HIGH RESOLUTION, MAGNETIC FLUX, SOLAR MAGNETIC FIELD, SOLAR OBSERVATORIES, SOLAR PHYSICS**

**N89-30151**† National Aeronautics and Space Administration. Goddard Space Flight Center, Greenbelt, MD. **NIMBUS-7 ERB SOLAR ANALYSIS TAPE (ESAT) USER'S GUIDE** EUGENE MAJOR, JOHN R. HICKEY, H. LEE KYLE, BRADLEY M. ALTON, and BRENDA J. VALLETTE (Research and Data Systems, Inc., Lanham, MD.) Nov. 1988 92 p (NASA-RP-1211; REPT-88-204; NAS 1.81:1211) Avail: NTIS HC A05/MF A01 CSCL 03B  
Seven years and five months of Nimbus-7 Earth Radiation Budget (ERB) solar data are available on a single ERB Solar Analysis Tape (ESAT). The period covered is November 16, 1978 through March 31, 1986. The Nimbus-7 satellite performs approximately 14 orbits per day and the ERB solar telescope observes the sun once per orbit as the satellite crosses the southern terminator. The solar data were carefully calibrated and screened. Orbital and daily mean values are given for the total solar irradiance plus other spectral intervals (10 solar channels in all). In addition, selected solar activity indicators are included on the ESAT. The ESAT User's Guide is an update of the previous ESAT User's Guide (NASA TM 86143) and includes more detailed information on the solar data calibration, screening procedures, updated solar data plots, and applications to solar variability. Details of the tape format, including source code to access ESAT, are included.

**AIR WATER INTERACTIONS, EL NINO, GEOMAGNETISM, SOLAR TERRESTRIAL INTERACTIONS, VOLCANOES**

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**SPACE RADIATION**

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

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.

**N89-14210**† National Aeronautics and Space Administration. Langley Research Center, Hampton, VA. **SOLAR-FLARE SHIELDING WITH REGOLITH AT A LUNAR-BASE SITE** JOHN E. NEALY, JOHN W. WILSON, and LAWRENCE W. TOWNSEND Dec. 1988 21 p (NASA-TP-2869; L-16488; NAS 1.60:2869) Avail: NTIS HC A03/MF A01 CSCL 03B  
**LUNAR BASES, LUNAR SURFACE, RADIATION DOSAGE, RADIATION SHIELDING, SOLAR FLARES**

**N89-16714**† National Aeronautics and Space Administration. Langley Research Center, Hampton, VA. **BENCHMARK SOLUTIONS FOR THE GALACTIC ION TRANSPORT EQUATIONS: ENERGY AND SPATIALLY DEPENDENT PROBLEMS** BARRY D. GANAPOL (Arizona Univ., Tucson.), LAWRENCE W.
93 SPACE RADIATION

TOWNSEND, and JOHN W. WILSON Washington, DC Mar. 1989 31 p (NASA-TP-2878; L-16519; NAS 1.60:2878) Avail: NTIS HC A03/MF A01 CSCL 03B
EQUATIONS OF MOTION, GALACTIC RADIATION, HEAVY IONS, ION BEAMS, IONIC MOBILITY, RADIATION HAZARDS, TRANSPORT THEORY

BARYONS, COMPUTER PROGRAMS, DATA BASES, ENERGY TRANSFER, TRANSPORT PROPERTIES

N89-25103# National Aeronautics and Space Administration. KAON-NUCLEUS SCATTERING Byungsik Hong, Khin Maung Maung, John W. Wilson, and Warren W. Buck (Hampton Inst., VA.) 1989 30 p (NASA-TP-2920; L-16583; NAS 1.60:2920) Avail: NTIS HC A03/MF A01 CSCL 03A
ABSORPTION CROSS SECTIONS, EIKONAL EQUATION, KAONS, MESON-NUCLEON INTERACTIONS, NUCLEAR SCATTERING, NUCLEONS, PARTICLE COLLISIONS, PARTICLE INTERACTIONS, PROTON SCATTERING, SCATTERING CROSS SECTIONS, SCHROEDINGER EQUATION

GALACTIC COSMIC RAYS, MANNED MARS MISSIONS, MARS ATMOSPHERE, MARS SURFACE, RADIATION DOSAGE, SOLAR FLARES

ASTRONAUTS, EXPOSURE, FLUENCE, MATHEMATICAL MODELS, ORGSNS, RADIATION DOSAGE, RADIATION SHIELDING, SOLAR COSMIC RAYS

COMPUTER PROGRAMS, EXTRATERRESTRIAL RADIATION, MONTE CARLO METHOD, RADIATION DOSAGE, RADIATION SHIELDING, RADIATION TRANSPORT

(A NASA-SP-4305; NAS 1.21:4305) Avail: SOD HC $30.00 as 033-000-00599-2; 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.

(A NASA-SP-4023; NAS 1.21:4023) Avail: SOD HC $13.00 as 033-000-01010-9; NTIS MF A01 CSCL 05D
This is the 18th in a series of annual chronologies of significant events in the fields of astronautics and aeronautics. Events covered are international as well as national and political as well as scientific and technical. This series is a reference work for historians, NASA personnel, government agencies, congressional staffs, and the media.

Author

(A NASA-SP-4012-VOL-1; NAS 1.21:4012-VOL-1; LC-74-600126) Avail: SOD HC $57.00 in set of 3 as 033-000-01017-6 CSCL 05D
This is Volume 1, NASA Resources 1958-1968, of a three-volume series providing a 20-year compilation of summary statistical and other data descriptive of NASA's programs in astronautics and manned and unmanned spacecraft. This series is an important component of NASA published historical reference works, used by NASA personnel, managers, external researchers, and other government agencies.

Author
aeronautics and manned and unmanned spaceflight. This series is an important component of NASA published historical reference works, used by NASA personnel, managers, external researchers, and other government agencies. Author

N88-25430*# National Aeronautics and Space Administration, Washington, DC.

LINDA NEUMAN EZELL 1988 492 p
(NASW-3597)
(Avail: NTIS MF A03; SOD HC $57.00 in set of 3 as 033-000-01017-6 CSCL 05D)

This is Volume 3. Programs and Projects 1969-1978, of a three-volume series providing a 20-year compilation of summary statistical and other data descriptive of NASA's programs in aeronautics and manned and unmanned spaceflight. This series is an important component of NASA published historical reference works, used by NASA personnel, managers, external researchers, and other government agencies. Author

N89-25946*# National Aeronautics and Space Administration, Washington, DC.

WHERE NO MAN HAS GONE BEFORE: A HISTORY OF APOLLO LUNAR EXPLORATION MISSIONS
WILLIAM DAVID COMPTON 1988 420 p Original contains color illustrations
(NASA-SP-4214; NAS 1.21:4214) Avail: NTIS HC A18/MF A03 CSCL 05D

This book is a narrative account of the development of the science program for the Apollo lunar landing missions. It focuses on the interaction between scientific interests and operational considerations in such matters as landing site selection and training of crews, quarantine and back contamination control, and presentation of results from scientific investigations. Scientific exploration of the moon on later flights, Apollo 12 through Apollo 17 is emphasized. Author

N89-26803*# National Aeronautics and Space Administration, Washington, DC.

ASTRONAUTICS AND AERONAUTICS, 1979-1984: A CHRONOLOGY
BETTE R. JANSON and ELEANOR H. RITCHIE Nov. 1989 736 p
(NASA-SP-4024; NAS 1.21:4024) Avail: NTIS HC A99/MF A04; also available SOD HC $24.00 as 033-000-01080-0 CSCL 05D

This volume of the Astronautics and Aeronautics series covers 1979 through 1984. The series provides a chronological presentation of all significant events and developments in space exploration and the administration of the space program during the period covered. Author

N89-26805*# National Aeronautics and Space Administration, Washington, DC.

(NASA-SP-4406; NAS 1.21:4406) Avail: NTIS HC A08/MF A01 CSCL 05D

This edition brings up to date the history of U.S. agencies for space exploration, the NACA and NASA, from 1915 through 1990. Early aviation and aeronautics research are described, with particular emphasis on the impact of the two world wars on aeronautics development and the postwar exploitation of those technologies. The reorganization and expansion of the NACA into NASA is described in detail as well as NASA's relationship with industry, the university system, and international space agencies such as the ESA. The dramatic space race of the 1950 and 1960s is recounted through a detailed history of the Gemini and Apollo programs and followed by a discussion of the many valuable social/scientific application of aeronautics technologies, many of which were realized through the launching of successful satellite projects. The further solar system explorations of the Voyager missions are described, as it the Challenger tragedy and the 1988 return to space of the Shuttle program. Future plans are outlined for a cooperatively funded international space station to foster the ongoing study of space science. Author
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