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A Catalog of
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1987

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Includes satellites; space platforms; space stations; spacecraft systems and components such as thermal and environmental controls; and attitude controls.
For life support systems see 54 Man/System Technology and Life Support. For related information see also 05 Aircraft Design, Testing and Performance, 39 Structural Mechanics, and 16 Space Transportation.

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

20 SPACECRAFT PROPULSION AND POWER 10
Includes main propulsion systems and components, e.g. rocket engines; and spacecraft auxiliary power sources.
For related information see also 07 Aircraft Propulsion and Power, 28 Propellants and Fuels, 44 Energy Production and Conversion, and 15 Launch Vehicles and Space Vehicles.

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

23 CHEMISTRY AND MATERIALS (GENERAL) 11

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

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

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

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

28 PROPELLANTS AND FUELS N.A.
Includes rocket propellants, igniters and oxidizers; their storage and handling procedures; and aircraft fuels.
For related information see also 07 Aircraft Propulsion and Power, 20 Spacecraft Propulsion and Power, and 44 Energy Production and Conversion.

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

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

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

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

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

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

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

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

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

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

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

42 GEOSCIENCES (GENERAL) 18

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

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

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

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

47 METEOROLOGY AND CLIMATOLOGY 20
Includes weather forecasting and modification.

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

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

51 LIFE SCIENCES (GENERAL) 21

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

70 PHYSICS (GENERAL) N.A.
For precision time and time interval (PTTI) see 35 Instrumentation and Photography; for geophysics, astrophysics or solar physics see 46 Geophysics, 90 Astrophysics, or 92 Solar Physics.
71 ACOUSTICS 23
Includes sound generation, transmission, and attenuation.
For noise pollution see 45 Environment Pollution.

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

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

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

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

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

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

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

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

81 ADMINISTRATION AND MANAGEMENT 24
Includes management planning and research.

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

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

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

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

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

88 SPACE SCIENCES (GENERAL) 25

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

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

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

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

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

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

99 GENERAL 27

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

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

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

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

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

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

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

02

AERODYNAMICS

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

N87-10039' # National Aeronautics and Space Administration. Langley Research Center, Hampton, Va.
WIND-TUNNEL INVESTIGATION OF THE FLIGHT CHARACTERISTICS OF A CANARD GENERAL-AVIATION AIRPLANE CONFIGURATION
D. R. SATRAN Oct. 1986 60 p (NASA-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
CAMBERED WINGS, REATTACHED FLOW, SUPERCRITICAL FLOW, SUPERSONIC AIRFOILS, SUPERSONIC FLOW

N87-10838' # National Aeronautics and Space Administration. Langley Research Center, Hampton, Va.
EFFECTS OF TAIL SPAN AND EMPENNAGE ARRANGEMENT ON DRAG OF A TYPICAL SINGLE-ENGINE FIGHTER AFT END
J. R. BURLEY, II and B. L. BERRIER Sep. 1984 136 p (NASA-TP-2352; L-15742; NAS 1.60:2352) Avail: NTIS HC A07/MF A01 CSCL 01A
AERODYNAMIC DRAG, AIRCRAFT CONFIGURATIONS, SKIN FRICTION, TAIL ASSEMBLIES, TRANSONIC SPEED
THREE-DIMENSIONAL, UNSTEADY, FULL-POTENTIAL CALCULATION
INTERNAL PERFORMANCE OF SINGLE-EXPANSION-RAMP NOZZLES WITH THRUST-VECTORIZATION CAPABILITY UP TO 60 DEG
B. L. BERRIER and L. D. LEAVITT Oct. 1984 144 p
(NASA-TP-2364; L-15766; NAS 1.60:2364) Avail: NTIS HC A07/MF A01 CSCL 01A
AXISYMMETRIC BODIES, NOZZLE FLOW, THRUST VECTOR CONTROL

N87-10841*# National Aeronautics and Space Administration. Ames Research Center, Moffett Field, Calif.
TRANSonic FLOW ANALYSIS FOR Rotors. PART 2: THREE-DIMENSIONAL, UNSTEADY, FULL-POTENTIAL CALCULATION
I. C. CHANG Jan. 1985 27 p
(NASA-TP-2375-PT-2; A-9682; NAS 1.60:2375-PT-2) Avail: NTIS HC A03/MF A01 CSCL 01A
AERODYNAMIC STABILITY, HELICOPTER PERFORMANCE, Rotors, Tip Vanes, TRANSonic FLOW

N87-10843*# National Aeronautics and Space Administration. Langley Research Center, Hampton, Va.
PILOTED SIMULATION STUDY OF THE EFFECTS OF AN AUTOMATED TRIM SYSTEM ON FLIGHT CHARACTERISTICS OF A LIGHT TWIN-ENGINE AIRPLANE WITH ONE ENGINE INOPERATIVE
(NASA-TP-2633; L-16147; NAS 1.60:2633) Avail: NTIS HC A03/MF A01 CSCL 01A
AERODYNAMIC BALANCE, AUTOMATIC FLIGHT CONTROL, ENGINE FAILURE, LIGHT AIRCRAFT

N87-11702*# National Aeronautics and Space Administration. Langley Research Center, Hampton, Va.
FORWARD-SWEPT WING CONFIGURATION DESIGNED FOR HIGH MANEUVERABILITY BY USE OF A TRANSonic COMPUTATIONAL METHOD
M. J. MANN and C. E. MERCER Nov. 1986 185 p
(NASA-TP-2628; L-16120; NAS 1.60:2628) Avail: NTIS HC A09/MF A01 CSCL 01A
AERODYNAMIC CONFIGURATIONS, HIGHLY MANEUVERABLE AIRCRAFT, Swopt FORWARD WINGS, TRANSonic SPEED

N87-12541*# National Aeronautics and Space Administration. Langley Research Center, Hampton, Va.
EFFECT OF PORT CORNER GEOMETRY ON THE INTERNAL PERFORMANCE OF A ROTATING-VANE-TYPE THRUST REVERSER
B. L. BERRIER and F. J. CAPONE Dec. 1986 51 p
(NASA-TP-2624; L-16135; NAS 1.60:2624) Avail: NTIS HC A04/MF A01 CSCL 01A
CORNER FLOW, NOZZLE GEOMETRY, PORTS (OPENINGS), ROTATING BODIES, THRUST REVERSAL, VANES, WIND TUNNEL TESTS

N87-14284*# National Aeronautics and Space Administration. Lewis Research Center, Cleveland, Ohio.
PROPAGATION OF SOUND WAVES IN TUBES OF NONCIRCULAR CROSS SECTION
W. B. RICHARDS (Oberlin Coll., Ohio) Aug. 1986 33 p
(NASA-TP-2601; E-2690; NAS 1.60:2601) Avail: NTIS HC A03/MF A01 CSCL 01A
ELLIPSOIDAL CYLINDERS, PIPES (TUBES), SOUND WAVES, WAVE PROPAGATION

N87-15174*# National Aeronautics and Space Administration. Langley Research Center, Hampton, Va.
APPLICABILITY OF LINEARIZED-THEORY ATTACHED-FLOW METHODS TO DESIGN AND ANALYSIS OF FLAP SYSTEMS AT LOW SPEEDS FOR THIN SWEPT WINGS WITH SHARP LEADING EDGES
HARRY W. CARLSON and CHRISTINE M. DARDEN Jan. 1987 54 p
(NASA-TP-2653; L-16151; NAS 1.60:2653) Avail: NTIS HC A04/MF A01 CSCL 01A
DESIGN ANALYSIS, FLAPS (CONTROL SURFACES), LINEARITY, LOW SPEED, SHARP LEADING EDGES, SWEPT WINGS, THIN WINGS, VORTEX FLAPS

N87-15183*# National Aeronautics and Space Administration. Langley Research Center, Hampton, Va.
EFFICIENT SOLUTIONS TO THE EULER EQUATIONS FOR SUPersonic FLOW WITH EMBEDDED SUBsonic REGIONS
ROBERT W. WALTERS and DOUGLAS L. DWOYER Jan. 1987 18 p
(NASA-TP-2523; L-15975; NAS 1.60:2523) Avail: NTIS HC A02/MF A01 CSCL 01A
EMBEDDING, EULER EQUATIONS OF MOTION, PROBLEM SOLVING, SUBsonic FLOW, SUPersonic FLOW

N87-15184*# National Aeronautics and Space Administration. Langley Research Center, Hampton, Va.
SUBsonic MANEUVER AND ANALYSIS OF A SUPersonic CRUISE Fighter WING CONCEPT
GREGORY D. RIEBE and CHARLES H. FOX, JR. Jan. 1987 74 p
(NASA-TP-2642; L-16097; NAS 1.60:2642) Avail: NTIS HC A04/MF A01 CSCL 01A
FIGHTER AIRCRAFT, MANEUVERS, SUBsonic SPEED, SUPersonic CRUISE AIRCRAFT RESEARCH, WINGS

N87-17665*# National Aeronautics and Space Administration. Lewis Research Center, Cleveland, Ohio.
PRELIMINARY DESIGN OF TURBOPUMPS AND RELATED MACHINERY
GEORGE F. WISLICENUS Oct. 1986 397 p
(NAS3-13475)
(NASA-RP-1170; E-7389; NAS 1.61:1170) Avail: NTIS HC A17/MF A01 CSCL 01A
Pumps used in large liquid-fuel rocket engines are examined. The term preliminary design denotes the initial, creative phases of design, where the general shape and characteristics of the machine are determined. This compendium is intended to provide the design engineer responsible for these initial phases with a physical understanding and background knowledge of the numerous special fields involved in the design process. Primary attention is directed to the pumping part of the turbopump and hence is concerned with essentially incompressible fluids. However, compressible flow principles are developed. As much as possible, the simplicity and reliability of incompressible flow considerations are retained by treating the mechanics of compressible fluids as a departure from the theory of incompressible fluids. Five areas are discussed: a survey of the field of turbomachinery in dimensionless form; the theoretical principles of the hydrodynamic design of turbomachinery; the hydrodynamic and gas dynamic design of axial flow turbomachinery; the hydrodynamic and gas dynamic design of radial and mixed flow turbomachinery; and some mechanical design considerations of turbomachinery. Theoretical considerations are presented with a relatively elementary mathematical treatment.

Author
N87-17668* # National Aeronautics and Space Administration. Langley Research Center, Hampton, Va. WIND-TUNNEL INVESTIGATION AT SUPERSONIC SPEEDS OF A REMOTE-CONTROLLED CANARD MISSILE WITH A FREE-ROLLING-TAIL BRAKE TORQUE SYSTEM A. B. BLAIR, JR. Mar. 1985 38 p (NASA-TP-2401; L-15862; NAS 1.60:2401) Avail: NTIS HC A03/MF A01 CSCL 01A BRAKING, CANARD CONFIGURATIONS, FINS, MISSILE CONFIGURATIONS, REMOTE CONTROL, ROLLING MOMENTS, SUPERSONIC SPEED, TAIL ASSEMBLIES, TORQUE, WIND TUNNEL TESTS

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


N87-19351* # National Aeronautics and Space Administration. Lewis Research Center, Cleveland, Ohio. NUMERICAL SIMULATION OF CHANNEL FLOW TRANSITION, RESOLUTION REQUIREMENTS AND STRUCTURE OF THE HAIRPIN VORTEX STEVEN E. KRIST (Joint Inst. for Advancement of Flight Sciences, Hampton, Va.) and THOMAS A. ZANG Apr. 1987 134 p (NASA-TP-2704; L-16227; NAS 1.60:2704) Avail: NTIS HC A07/MF A01 CSCL 01A AERODYNAMICS, COMPUTERIZED SIMULATION, DESIGN ANALYSIS, NUMERICAL ANALYSIS, PRESSURE DISTRIBUTION


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


N87-22262* # National Aeronautics and Space Administration. Langley Research Center, Hampton, Va. EXPERIMENTAL CAVITY PRESSURE DISTRIBUTIONS AT SUPERSONIC SPEEDS ROBERT L. STALLINGS, JR. and FLOYD J. WILCOX, JR. Jun. 1987 79 p (NASA-TP-2683; L-16215; NAS 1.60:2683) Avail: NTIS HC A05/MF A01 CSCL 01A CAVITIES, FLUID FLOW, PRESSURE DISTRIBUTION, SUPERSONIC SPEED

N87-23586# National Aeronautics and Space Administration. Langley Research Center, Hampton, Va. ON MINIMIZING THE NUMBER OF CALCULATIONS IN DESIGN-BY-ANALYSIS CODES RAYMOND L. BARGER and ANUTOSH MOitra Jun. 1987 16 p (NASA-TP-2706; L-16226; NAS 1.60:2706) Avail: NTIS HC A02/MF A01 CSCL 01A AERODYNAMIC CONFIGURATIONS, APPROXIMATION, DESIGN ANALYSIS, NUMERICAL ANALYSIS, PRESSURE DISTRIBUTION

02 AERODYNAMICS
**02 AERODYNAMICS**

**N87-23592** National Aeronautics and Space Administration. Langley Research Center, Hampton, Va. MACH 6 EXPERIMENTAL AND THEORETICAL STABILITY AND PERFORMANCE OF A CRUCIFORM MISSILE AT ANGLES OF ATTACK UP TO 65 DEGREES

Edward R. Hartman (Arnold Engineering Development Center, Arnold Air Force Station, Tenn.) and Patrick J. Johnston

Jul. 1987 41 p

(NASA-TP-2733; L-16267; NAS 1.60:2733) Avail: NTIS HC A03/MF A01 CSCL 01A

ANGLE OF ATTACK, CRUCIFORM WINGS, EXPERIMENTATION, HYPERSONIC SPEED, MACH NUMBER, MISSELS

**N87-23593** National Aeronautics and Space Administration. Langley Research Center, Hampton, Va. EFFECT OF A TRADE BETWEEN BOATTAIL ANGLE AND WEDGE SIZE ON THE PERFORMANCE OF A NONAXISYMMETRIC WEDGE NOZZLE

George T. Carson, Jr., E. Ann Bare, and James R. Burley, II

Jul. 1987 67 p

(NASA-TP-2717; L-16248; NAS 1.60:2717) Avail: NTIS HC A04/MF A01 CSCL 01A

AXISYMMETRIC BODIES, BOATTAILS, NOZZLE GEOMETRY, PERFORMANCE TESTS, TRADEOFFS, WEDGES

**N87-23597** National Aeronautics and Space Administration. Langley Research Center, Hampton, Va. STUDY OF LEE-SIDE FLOWS OVER CONICALLY CAMBERED DELTA WINGS AT SUPERSONIC SPEEDS, PART 1

Richard M. Wood and Carolyn B. Watson

Jul. 1987 212 p

(NASA-TP-2660-PT-1; L-16192; NAS 1.60:2660-PT-1) Avail: NTIS HC A10/MF A01 CSCL 01A

CONICAL CAMBER, DELTA WINGS, FLOW DISTRIBUTION, LEE WAVES, STRUCTURAL DESIGN, SUPERSONIC FLOW, VORTICES

**N87-24410** National Aeronautics and Space Administration. Ames Research Center, Moffett Field, Calif. PROCEEDINGS OF THE 1985 NASA AMES RESEARCH CENTER'S GROUND-EFFECTS WORKSHOP

Kerry Mitchell, Ed.


(NASA-CP-2462; A-86391; NAS 1.55:2462) Avail: NTIS HC A19/MF A01 CSCL 01A

GROUND EFFECT, INGESTION (ENGINES), POWERED LIFT AIRCRAFT, V/STOL AIRCRAFT, VERTICAL LANDING

**N87-24432** National Aeronautics and Space Administration. Langley Research Center, Hampton, Va. STATIC INTERNAL PERFORMANCE OF A TWO-DIMENSIONAL CONVERGENT-DIVERGENT NOZZLE WITH THRUST VECTORING

E. Ann Bare and David E. Reubush

Jul. 1987 115 p

(NASA-TP-2721; L-16240; NAS 1.60:2721) Avail: NTIS HC A06/MF A01 CSCL 01A

CONVERGENT-DIVERGENT NOZZLES, STATIC TESTS, THRUST VECTOR CONTROL, TWO DIMENSIONAL FLOW

**N87-24433** National Aeronautics and Space Administration. Langley Research Center, Hampton, Va. MULTIAxis CONTROL POWER FROM THRUST VECTORING FOR A SUPERSONIC FIGHTER AIRCRAFT MODEL AT MACH 0.20 TO 2.47

Francis J. Capone and E. Ann Bare

Jul. 1987 264 p

(NASA-TP-2712; L-16213; NAS 1.60:2712) Avail: NTIS HC A12/MF A01 CSCL 01A

FIGHTER AIRCRAFT, MACH NUMBER, SUPERSONIC CRUISE AIRCRAFT RESEARCH, THRUST VECTOR CONTROL

**N87-25301** National Aeronautics and Space Administration. Langley Research Center, Hampton, Va. STUDY OF LEE-SIDE FLOWS OVER CONICALLY CAMBERED DELTA WINGS AT SUPERSONIC SPEEDS, PART 2

Richard M. Wood and Carolyn B. Watson

Jul. 1987 404 p

(NASA-TP-2660-PT-2; L-16192; NAS 1.60:2660-PT-2) Avail: NTIS HC A18/MF A01 CSCL 01A

CONICAL CAMBER, DELTA WINGS, FLOW DISTRIBUTION, FLOW VISUALIZATION, SUPERSONIC FLOW, WING LOADING

**N87-25998** National Aeronautics and Space Administration. Ames Research Center, Moffett Field, Calif. SUPERCOMPUTING IN AEROSPACE

Paul Kutler and Helen Yee


(NASA-CP-2454; A-87082; NAS 1.55:2454) Avail: NTIS HC A13/MF A01 CSCL 01A

COMPUTATIONAL ASTROPHYSICS, COMPUTATIONAL CHEMISTRY, COMPUTATIONAL FLUID DYNAMICS, COMPUTATIONAL GRID, COMPUTERIZED SIMULATION, CONFERENCES, INTERACTIONAL AERODYNAMICS, NAVIER-STOKES EQUATION, SUPERCOMPUTERS

**N87-26031** National Aeronautics and Space Administration. Langley Research Center, Hampton, Va. EFFECT OF REYNOLDS NUMBER VARIATION ON AERODYNAMICS OF A HYDROGEN-FUELED TRANSPORT CONCEPT AT MACH 6

Jim A. Penland and Sonson C. Marcum, Jr.

Aug. 1987 28 p

(NASA-TP-2728; L-16286; NAS 1.60:2728) Avail: NTIS HC A03/MF A01 CSCL 01A

AERODYNAMIC CONFIGURATIONS, HYDROGEN FUELS, HYPERSONIC AIRCRAFT, MACH NUMBER, REYNOLDS NUMBER, TRANSPORT AIRCRAFT

**N87-26032** National Aeronautics and Space Administration. Langley Research Center, Hampton, Va. STEADY AND UNSTEADY AERODYNAMIC FORCES FROM THE SOUSSA SURFACE-PANEL METHOD FOR A FIGHTER WING WITH TIP MISSILE AND COMPARISON WITH EXPERIMENT AND 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 FLOW, WINGS

**N87-26674** National Aeronautics and Space Administration. Langley Research Center, Hampton, Va. SUBSONIC LONGITUDINAL AND LATERAL-DIRECTIONAL CHARACTERISTICS OF A FORWARD-SWEEP-WING FIGHTER CONFIGURATION AT ANGLES OF ATTACK UP TO 47 DEG

Michael J. Mann, Jarrett K. Huffman, and Charles H. Fox, Jr.

Sep. 1987 103 p

(NASA-TP-2727; L-16206; NAS 1.60:2727) Avail: NTIS HC A06/MF A01 CSCL 01A

AERODYNAMIC CONFIGURATIONS, ANGLE OF ATTACK, FIGHTER AIRCRAFT, LATERAL CONTROL, LATERAL STABILITY, SUBSONIC AIRCRAFT, SWEPT FORWARD WINGS

**N87-26683** National Aeronautics and Space Administration. Langley Research Center, Hampton, Va. AN EXPERIMENTAL INVESTIGATION OF AN ADVANCED TURBOPROP INSTALLATION ON A SWEPT WING AT SUBSONIC AND TRANSONIC SPEEDS

John R. Carlson and Odis C. Pendergraft, Jr.

Sep. 1987 242 p

(NASA-TP-2729; L-16043; NAS 1.60:2729) Avail: NTIS HC A11/MF A01 CSCL 01A

AERODYNAMICS, ENGINE AIRFRAME INTEGRATION, SUBSONIC SPEED, SWEEP WINGS, TRANSONIC SPEED, TURBOPROP ENGINES
05 AIRCRAFT DESIGN, TESTING AND PERFORMANCE


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


N87-24458# National Aeronautics and Space Administration. Langley Research Center, Hampton, Va. MEASUREMENTS OF FLOW RATE AND TRAJECTORY OF AIRCRAFT TIRE-GENERATED WATER SPRAY ROBERT H. DAUGHERTY and SANDY M. STUBBS Jul. 1987 18 p (NASA-TP-2718; L-16195; NAS 1.60:2718) Avail: NTIS HC A06/MF A01 CSCL 01C AIRCRAFT TIRES, ENGINE INLETS, FLOW VELOCITY, INGESTION (ENGINES), SPLASHING, SPRAYING

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


The practical application of parameter estimation methodology to the problem of estimating aircraft stability and control derivatives from flight test data is examined. The primary purpose of the
document is to present a comprehensive and unified picture of the entire parameter estimation process and its integration into a flight test program. The document concentrates on the output-error method to provide a focus for detailed examination and to allow us to give specific examples of situations that have arisen. The document first derives the aircraft equations of motion in a form suitable for application to estimation of stability and control derivatives. It then discusses the issues that arise in adapting the equations to the limitations of analysis programs, using a specific example. The roles and issues relating to mass distribution data, preflight predictions, maneuver design, flight scheduling, instrumentation sensors, data acquisition systems, and data processing are then addressed. Finally, the document discusses evaluation and the use of the analysis results. Author

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
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 A02/MF A01 CSCL 01D
ALIGNMENT, DIRECTIONAL CONTROL, DISPLAY DEVICES, ELECTRONIC EQUIPMENT, FLIGHT TESTS, INERTIAL NAVIGATION, PERFORMANCE TESTS, VELOCITY

N87-19393*# National Aeronautics and Space Administration. Langley Research Center, Hampton, Va.
A SIMULATION EVALUATION OF A PILOT INTERFACE WITH AN AUTOMATIC TERMINAL APPROACH SYSTEM
DAVID A. HINTON Apr. 1987 21 p (NASA-TP-2699; L-16222; NAS 1.60:2699) Avail: NTIS HC A02/MF A01 CSCL 17G
APPROACH CONTROL, AUTOMATIC CONTROL, AUTOMATIC PILOTS, GENERAL AVIATION AIRCRAFT, MAN MACHINE SYSTEMS

N87-29533*# National Aeronautics and Space Administration. Ames Research Center, Moffett Field, Calif.
ANALOG SIGNAL CONDITIONING FOR FLIGHT-TEST INSTRUMENTATION
The application of analog signal conditioning to flight-tests data acquisition systems is discussed. Emphasis is placed on practical applications of signal conditioning for the most common flight-test data-acquisition systems. A limited amount of theoretical discussion is included to assist the reader in a more complete understanding of the subject matter. Nonspecific signal conditioning, such as amplification, filtering, and multiplexing, is discussed. Signal conditioning for various specific transducers and data terminal devices is also discussed to illustrate signal conditioning that is unique to particular types of transducers. The purpose is to delineate for the reader the various signal-conditioning technique options, together with tradeoff considerations, for commonly encountered flight-test situations. Author

07 AIRCRAFT PROPULSION AND POWER

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

N87-17699*# National Aeronautics and Space Administration. Lewis Research Center, Cleveland, Ohio.
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, Ohio.
NASA-CHINESE AERONAUTICAL ESTABLISHMENT (CAE) SYMPOSIUM
COMBUSTION, FLUID DYNAMICS, THERMODYNAMICS

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

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

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 F. J. CAPONE and M. L. MASON Oct. 1984 104 p (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

AEROELASTIC CHARACTERISTICS OF AN OBLIQUE-WING RESEARCH AIRPLANE

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


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 AERODYNAMIC CONFIGURATIONS, FLIGHT CHARACTERISTICS, LOW SPEED, OBLIQUE WINGS, RESEARCH AIRCRAFT


RESEARCH AND SUPPORT FACILITIES (AIR)

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


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

N87-17717* National Aeronautics and Space Administration. Lewis Research Center, Cleveland, Ohio. EXPERIMENTAL EVALUATION OF WALL MACH NUMBER DISTRIBUTIONS OF THE OCTAGONAL TEST SECTION PROPOSED FOR NASA LEWIS RESEARCH CENTER'S ALTITUDE WIND TUNNEL DOUGLAS E. HARRINGTON, RICHARD R. BURLEY, and ROBERT R. CORBAN Nov. 1986 35 p (NASA-TP-2666; E-3145; NAS 1.60:2666) Avail: NTIS HC A03/MF A01 CSCL 14B FLOW VELOCITY, MACH NUMBER, WIND TUNNEL APPARATUS, WIND TUNNEL WALLS

N87-18575* National Aeronautics and Space Administration. Lewis Research Center, Cleveland, Ohio. 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-2646; E-3175; NAS 1.60:2646) Avail: NTIS HC A07/MF A01 CSCL 14B CORNER FLOW, VANES, WIND TUNNEL APPARATUS, WIND TUNNEL DRIVES
15 LAUNCH VEHICLES AND SPACE VEHICLES

12 ASTRONAUTICS (GENERAL)

N87-20302*# National Aeronautics and Space Administration. Goddard Space Flight Center, Greenbelt, Md.
THE 1986 GET AWAY SPECIAL EXPERIMENTER'S SYMPOSIUM
CONFERENCES, GETAWAY SPECIALS (STS), GOVERNMENT/INDUSTRY RELATIONS, SPACE SHUTTLE PAYLOADS, UNIVERSITIES

N87-29576*# 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 228
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

15 LAUNCH VEHICLES AND SPACE VEHICLES

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

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, Ala.
SYSTEM STUDY OF THE CARBON DIOXIDE OBSERVATIONAL PLATFORM SYSTEM (CO-OPS): PROJECT OVERVIEW
ATMOSPHERIC COMPOSITION, CARBON DIOXIDE, REMOTE SENSING, SPACE PLATFORMS
15 LAUNCH VEHICLES AND SPACE VEHICLES

STRUCTURAL DYNAMICS AND CONTROL INTERACTION OF FLEXIBLE STRUCTURES
(NASA-CP-2467-PT-1; M-554-PT-1; NAS 1.55:2467-PT-1) Avail: NTIS HC A99/MF E03 CSCL 22B
CONTROL SYSTEMS DESIGN, DYNAMIC STRUCTURAL ANALYSIS, FLEXIBLE BODIES, LARGE SPACE STRUCTURES, SPACECRAFT CONTROL

N87-22729*# National Aeronautics and Space Administration. Marshall Space Flight Center, Huntsville, Ala.
STRUCTURAL DYNAMICS AND CONTROL INTERACTION OF FLEXIBLE STRUCTURES
(NASA-CP-2467-PT-2; M-554-PT-2; NAS 1.55:2467-PT-2) Avail: NTIS HC A14/MF E03 CSCL 22B
CONFERENCES, DESIGN ANALYSIS, DYNAMIC STRUCTURAL ANALYSIS, FLEXIBLE BODIES, JOINTS (JUNCTIONS), LARGE SPACE STRUCTURES, ORBITAL SPACE STATIONS

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

DEVELOPMENT TESTING OF LARGE VOLUME WATER SPRAYS FOR WARM FOG DISPERSAL
(NASA-TP-2607; NAS 1.60:2607) Avail: NTIS HC A06/MAA01 CSCL 14B
COALESING, FOG DISPERSAL, SPACE SHUTTLES, SPACECRAFT LAUNCHING, SPRAY NOZZLES, WATER

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

N87-16014*# National Aeronautics and Space Administration. Langley Research Center, Hampton, Va.
NAVY/DO-D CONTROL/STRUCTURES INTERACTION TECHNOLOGY, 1986
ROBERT L. WRIGHT, comp. Nov. 1986 549 p Conference held in Norfolk, Va., 12-18 Nov. 1986; sponsored by NASA Langley Research Center and AFWAL
(NASA-CP-2447-PT-1; L-15242-PT-1; NAS 1.55:2447-PT-1) Avail: NTIS HC A23/MAF A01 CSCL 22B
ANTENNAS, CONFERENCES, FLEXIBLE SPACECRAFT, LARGE SPACE STRUCTURES, SPACE STATIONS, SPACECRAFT CONTROL, SPACECRAFT DESIGN, SYSTEMS ENGINEERING, TRUSSES, VIBRATION DAMPING

N87-24495*# National Aeronautics and Space Administration. Langley Research Center, Hampton, Va.
NAVY/DO-D CONTROL/STRUCTURES INTERACTION TECHNOLOGY, 1986
(NASA-CP-2447-PT-2; L-15242-PT-2; NAS 1.55:2447-PT-2) Avail: NTIS HC A14/MAF A01 CSCL 22B
CONTROL STABILITY, CONTROL SYSTEMS DESIGN, INTERACTIVE CONTROL, ORBITAL SPACE STATIONS, SPACECRAFT CONTROL, VIBRATION DAMPING

N87-26075* National Aeronautics and Space Administration, Washington, D.C.
SPACE STATION SYSTEMS: A BIBLIOGRAPHY WITH INDEXES (SUPPLEMENT 4)
May 1987 220 p
(NASA-SP-7056(04); NAS 1.21:7056(04)) Avail: NTIS HC 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, and 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.

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

N87-20380*# National Aeronautics and Space Administration. Marshall Space Flight Center, Huntsville, Ala.
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/AA01 CSCL 10A
LARGE SPACE STRUCTURES, SOLAR ARRAYS, SOLAR DYNAMIC POWER SYSTEMS, SPACE ERECTABLE STRUCTURES, SPACE SHUTTLE PAYLOADS

N87-20381*# National Aeronautics and Space Administration. Lewis Research Center, Cleveland, Ohio.
EXPERIMENTAL THRUST PERFORMANCE OF A HIGH-AREA-RATIO ROCKET NOZZLE
(NASA-TP-2720; E-3236-1; NAS 1.60:2720) Avail: NTIS HC A02/MAF A01 CSCL 21H
AREA, NOZZLE GEOMETRY, ROCKET NOZZLES, ROCKET THRUST
24 COMPOSITE MATERIALS

N87-18611*# National Aeronautics and Space Administration. Langley Research Center, Hampton, Va.
SPECTROSCOPIC COMPARISON OF EFFECTS OF ELECTRON RADIATION ON MECHANICAL PROPERTIES OF TWO POLYIMIDES
EDWARD R. LONG, JR. and SHEILA ANN T. LONG Apr. 1987 21 p
(NASA-TP-2663; L-16200; NAS 1.60:2663) Avail: NTIS HC A02/MF A01 CSCL 11C
DURABILITY, ELECTRON RADIATION, KAPTON (TRADE-MARK), RADIATION DAMAGE, TENSILE PROPERTIES

24 COMPOSITE MATERIALS

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

N87-10184*# National Aeronautics and Space Administration. Langley Research Center, Hampton, Va.
EFFECTS OF THERMAL CYCLING ON GRAPHITE-FIBER-REINFORCED 6061 ALUMINUM
(NASA-TP-2612; L-16139; NAS 1.60:2612) Avail: NTIS HC A03/MF A01 CSCL 11D
ALUMINUM GRAPHITE COMPOSITES, CARBON FIBERS, METAL MATRIX COMPOSITES, REINFORCING FIBERS, SPACECRAFT STRUCTURES, THERMAL CYCLING TESTS

N87-29612*# National Aeronautics and Space Administration. Langley Research Center, Hampton, Va.
THE ACEE PROGRAM AND BASIC COMPOSITES RESEARCH AT LANGLEY RESEARCH CENTER (1975 TO 1986): SUMMARY AND BIBLIOGRAPHY
MARVIN B. DOW Oct. 1987 147 p
(NASA-RP-1177; L-16290; NAS 1.61:1177) Avail: NTIS HC A07/MF A01 CSCL 11D
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.
25 INORGANIC AND PHYSICAL CHEMISTRY

INORGANIC AND PHYSICAL CHEMISTRY

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

N87-18629* National Aeronautics and Space Administration. Langley Research Center, Hampton, Va.
ELECTRON STIMULATED DESORPTION OF ATOMIC OXYGEN FROM SILVER
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 A02/MF A01 CSCL 07D
ATOMIC BEAMS, DESORPTION, ELECTRON EMISSION, OXYGEN, SILVER, STIMULATED EMISSION

N87-20407* National Aeronautics and Space Administration. Langley Research Center, Hampton, Va.
EFFECT OF LID (REGISTERED) PROCESSING ON THE MICROSTRUCTURE AND MECHANICAL PROPERTIES OF TI-6AL-4V AND TI-6AL-2SN-4ZR-2MO TITANIUM FOIL-GAUGE MATERIALS
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

THE CORROSION MECHANISMS FOR PRIMER COATED 2219-T87 ALUMINUM
MERLIN D. DANFORD and WARD W. KNOCKEMUS (Huntingdon Coll., Montgomery, Ala.) Jul. 1987 19 p
(NASA-TP-2715; M-556; NAS 1.60:2715) Avail: NTIS HC A02/MF A01 CSCL 11F
ALUMINUM ALLOYS, CORROSION RESISTANCE, PRIMERS (COATINGS), PROTECTIVE COATINGS

HYDROGEN TRAPPING AND THE INTERACTION OF HYDROGEN WITH METALS
MERLIN D. DANFORD 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
MICROGRAVITY CRYSTALLIZATION OF MACROMOLECULES: AN INTERIM REPORT AND PROPOSAL FOR CONTINUED RESEARCH
CSCL 268
MOLECULES, POLYMER CHEMISTRY, RECRYSTALLIZATION, REDUCED GRAVITY

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, Ohio.
MANAGEMENT, WEIGHTLESSNESS

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

CONTROL SYSTEMS DESIGN, DIGITAL FILTERS, DIGITAL SYSTEMS, STATE VECTORS, SYSTEMS ENGINEERING

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 A02/MF A01 CSCL 09B
CONTROL SYSTEMS DESIGN, DIGITAL FILTERS, DIGITAL SYSTEMS, STATE ESTIMATION

N87-27067* National Aeronautics and Space Administration. Marshall Space Flight Center, Huntsville, Ala.
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 A02/MF A01 CSCL 13H
DIGITAL COMMAND SYSTEMS, STATE ESTIMATION, STATE VECTORS

N87-20448* National Aeronautics and Space Administration. Lewis Research Center, Cleveland, Ohio.
UNIQUE BIT-ERROR-RATE MEASUREMENT SYSTEM FOR SATELLITE COMMUNICATION SYSTEMS MARY JO WINDMILLER Mar. 1987 13 p (NASA-TP-2699; E-3322; NAS 1.60:2699) Avail: NTIS HC A02/MF A01 CSCL 17B
BIT ERROR RATE, COMMUNICATION NETWORKS, SATELLITE COMMUNICATION, SYSTEMS ANALYSIS

32 COMMUNICATIONS AND RADAR
Includes radar; land and global communications; communications theory; and optical communications.

The hardware and software characteristics of a time division multiplex system are described. The system is used to sample analog and digital data. The data is merged with synchronization information to produce a serial pulse coded modulation (PCM) bit stream. Information presented herein is required by users to design compatible interfaces and assure effective utilization of this encoder system. GSFC/Wallops Flight Facility has flown approximately 50 of these systems through 1984 on sounding rockets with no inflight failures. Aydin Vector manufactures all of the components for these systems. Author

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

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 A02/MF A01 CSCL 17B
BIT ERROR RATE, PERFORMANCE TESTS, TRANSMISSION EFFICIENCY, TRAVELING WAVE TUBES

A SYNCHRONOUS DATA ANALYZER FOR THE MINIMUM DELAY DATA FORMAT (MDDF) AND LAUNCH TRAJECTORY ACQUISITION SYSTEM (LTAS) ANDREW J. GREEN Jul. 1987 10 p (NASA-TP-2743; REPT-822.1; NAS 1.60:2743) Avail: NTIS HC A02/MF A01 CSCL 17B
DATA REDUCTION, LAUNCHING, SAMPLING, SYNCHRONISM, TRAJECTORY ANALYSIS
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
ACCUMULATORS, CURRENT DENSITY, ELECTRODES, ELECTRON EMISSION, TRAVELING WAVE TUBES

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

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

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

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

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

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

FLUID MECHANICS AND HEAT TRANSFER

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

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

N87-13664*# National Aeronautics and Space Administration. Langley Research Center, Hampton, Va.
AEROETHERMAL TESTS OF SPHERICAL DOME PROTUBERANCES ON A FLAT PLATE AT A MACH NUMBER OF 6.5.
AEROTHERMODYNAMICS, HYPERSONIC VEHICLES, LAMINAR BOUNDARY LAYER, PREDICTION ANALYSIS TECHNIQUES, PROTUBERANCES, THERMAL PROTECTION, TILES, TURBULENT BOUNDARY LAYER

N87-17000*# National Aeronautics and Space Administration. Marshall Space Flight Center, Huntsville, Ala.
SPACE SHUTTLE MAIN ENGINE HIGH PRESSURE FUEL PUMP AFT PLATFORM SEAL CAVITY FLOW ANALYSIS
CAVITIES, FUEL PUMPS, HIGH PRESSURE, SEALS (STOPPERS), SPACE SHUTTLE MAIN ENGINE, TURBINE PUMPS
34 FLUID MECHANICS AND HEAT TRANSFER

N87-18034# National Aeronautics and Space Administration. Lewis Research Center, Cleveland, Ohio. JET MODEL FOR SLOT FILM COOLING WITH EFFECT OF FREE-STREAM AND COOLANT TURBULENCE FREDERICK F. SIMON Oct. 1986 21 p (NASA-TP-2655; E-2961; NAS 1.60:2955) Avail: NTIS HC A02/MF A01 CSCL 20D FILM COOLING, FLOW VELOCITY, JET ENGINES, NUMERICAL ANALYSIS, TURBULENCE EFFECTS, WALL JETS

N87-18035# National Aeronautics and Space Administration. Lewis Research Center, Cleveland, Ohio. VELOCITY PROFILES IN LAMINAR DIFFUSION FLAMES VALERIE J. LYONS and JANICE M. MARGLE (Pennsylvania State Univ., Abington) May 1986 13 p Presented at the Combustion Inst. Meeting, Cleveland, Ohio, 5-8 May 1986 (NASA-TP-2596; E-2879; NAS 1.60:2596) Avail: NTIS HC A02/MF A01 CSCL 20D CYCLOHEXANE, DIFFUSION FLAMES, ETHYL ALCOHOL, HEPTANES, LAMINAR FLOW, OCTANES, TEMPERATURE PROFILES, VELOCITY MEASUREMENT

N87-18782# National Aeronautics and Space Administration. Langley Research Center, Hampton, Va. AERO THERMAL EVALUATION OF A SPHERICALLY BLUNTED BODY WITH A TRAPEZOIDAL CROSS SECTION IN THE LANGLEY 8-FOOT HIGH-TEMPERATURE TUNNEL CINDY W. ALBERTSON Apr. 1987 83 p (NASA-TP-2641; L-16096; NAS 1.60:2641) Avail: NTIS HC A05/MF A01 CSCL 20D BOUNDARY LAYERS, FLOW DISTRIBUTION, HEAT TRANSFER, PREDICTIONS, PRESSURE MEASUREMENT, THERMAL PROTECTION

N87-18783# National Aeronautics and Space Administration. Langley Research Center, Hampton, Va. A SECOND-ORDER ACCURATE KINETIC-THEORY-BASED METHOD FOR IN VISCID COMPRESSIBLE FLOWS SURESH M. DESHPANDE Dec. 1986 42 p (NASA-TP-2613; L-16050; NAS 1.60:2613) Avail: NTIS HC A03/MF A01 CSCL 20D BOLTZMANN TRANSPORT EQUATION, EULER EQUATIONS OF MOTION, KINETIC THEORY, NUMERICAL ANALYSIS, SHOCK WAVE PROPAGATION


N87-23921# National Aeronautics and Space Administration. Lewis Research Center, Cleveland, Ohio. THREE-STEP LABYRINTH SEAL FOR HIGH-PERFORMANCE TURBOMACHINES ROBERT C. HENDRICKS Jun. 1987 75 p (NASA-TP-1848; E-3186; NAS 1.60:1848) Avail: NTIS HC A04/MF A01 CSCL 20D FUEL PUMPS, LABYRINTH SEALS, SPACE SHUTTLE MAIN ENGINE, STATIC TESTS, TURBOMACHINERY

N87-23936# National Aeronautics and Space Administration. Lewis Research Center, Cleveland, Ohio. STRAIGHT CYLINDRICAL SEAL FOR HIGH-PERFORMANCE TURBOMACHINES ROBERT C. HENDRICKS Jun. 1987 76 p (NASA-TP-1850; E-3185; NAS 1.60:1850) Avail: NTIS HC A05/MF A01 CSCL 20D CYLINDRICAL BODIES, FUEL PUMPS, SEALS (STOPPERS), SPACE SHUTTLE MAIN ENGINE, TURBINE PUMPS, TURBOMACHINERY

N87-24639# National Aeronautics and Space Administration. Lewis Research Center, Cleveland, Ohio. THREE-STEP CYLINDRICAL SEAL FOR HIGH-PERFORMANCE TURBOMACHINES ROBERT C. HENDRICKS Jun. 1987 79 p (NASA-TP-1849; E-3185; NAS 1.60:1849) Avail: NTIS HC A05/MF A01 CSCL 20D DYNAMIC STABILITY, FUEL PUMPS, LEAKAGE, PUMP SEALS, SPACE SHUTTLE MAIN ENGINE, TURBINE PUMPS


N87-26309# National Aeronautics and Space Administration. Langley Research Center, Hampton, Va. SIMPLIFIED CURVE FITS FOR THE THERMODYNAMIC PROPERTIES OF EQUILIBRIUM AIR S. SRINIVASAN, J. C. TANNEHILL (Iowa State Univ. of Science and Technology, Ames.), and K. J. WEILMUENSTER Aug. 1987 48 p (NAG1-3131) (NASA-TP-2758; E-3418; NAS 1.60:2758) Avail: NTIS HC A03/MF A01 CSCL 20D 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. 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 transition functions to model the thermodynamic surfaces in a piecewise manner. The accuracies and continuity of these curve fits are substantially improved over those of previous curve fits. These improvements are due to the incorporation of a small 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 25 000 K and densities from 10 to the -7 to 10 to the 3d power amagats. Author

N87-27161# National Aeronautics and Space Administration. Lewis Research Center, Cleveland, Ohio. APPLICATION OF TURBULENCE MODELING TO PREDICT SURFACE HEAT TRANSFER IN STAGNATION FLOW REGION OF CIRCULAR CYLINDER CHI R. WANG and FREDDIE C. YEH Sep. 1987 25 p (NASA-TP-2758; E-3418; NAS 1.60:2758) Avail: NTIS HC A02/MF A01 CSCL 20D CIRCULAR CYLINDERS, HEAT TRANSFER, MODELS, STAGNATION FLOW, SURFACE PROPERTIES, TURBULENCE
INSTRUMENTATION AND PHOTOGRAPHY

Includes remote sensors; measuring instruments and gages; detectors; cameras and photographic supplies; and holography.

MECHANICAL ENGINEERING

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

LASERS AND MASERS

Includes parametric amplifiers.

MECHANICAL ENGINEERING

Includes auxiliary systems (nonpower); machine elements and processes; and mechanical equipment.
VIBRATION CHARACTERISTICS OF OH-58A HELICOPTER MAIN ROTOR TRANSMISSION
DAVID G. LEWICKI and JOHN J. COY Apr. 1987 18 p (NASA-TP-2705; E-3368; NAS 1.60:2705; AVSCOM-TR-86-C-42; AD-A180364) Avail: NTIS HC A01/MF A01 CSCL 01C
HELICOPTERS, ROTOR AERODYNAMICS, TRANSMISSIONS (MACHINE ELEMENTS), VIBRATION MEASUREMENT

ROTOR DYNAMIC INSTABILITY PROBLEMS IN HIGH-PERFORMANCE TURBOMACHINERY, 1986

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

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-16268; NAS 1.60:2738) Avail: NTIS HC A03/MF A01 CSCL 14D
COMPUTERS, ERROR ANALYSIS, EVALUATION, FAULT TOLERANCE, INTEGRATED CIRCUITS, VERY LARGE SCALE INTEGRATION

Sensitivity Analysis in Engineering
DYNAMIC STRUCTURAL ANALYSIS, EIGENVALUES, MODAL RESPONSE, OPTIMIZATION, SENSITIVITY
N87-20566*#  National Aeronautics and Space Administration. Lewis Research Center, Cleveland, Ohio. 
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 A01/MF A01 CSLCL 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 A03/MF A01 CSLCL 20K 
- DYNAMIC STRUCTURAL ANALYSIS, JOINTS (JUNCTIONS), LARGE SPACE STRUCTURES, MODELS, TRUSSES 

N87-20568*#  National Aeronautics and Space Administration. Marshall Space Flight Center, Huntsville, Ala. 
SPACE STATION STRUCTURES AND DYNAMICS TEST PROGRAM 
- DYNAMIC STRUCTURAL ANALYSIS, DYNAMIC TESTS, LARGE SPACE STRUCTURES, SPACE STATION STRUCTURES, SPACE STATIONS, SYSTEMS ANALYSIS 

N87-27321*#  Computer Software Management and Information Center, Athens, Ga. 
FIFTEENTH NASTRAN USERS' COLLOQUIUM 
- COMPUTER AIDED DESIGN, COMPUTER TECHNIQUES, CONFERENCES, FINITE ELEMENT METHOD, NASTRAN, STRUCTURAL ANALYSIS, STRUCTURAL VIBRATION 

N87-29856*#  National Aeronautics and Space Administration. Lyndon B. Johnson Space Center, Houston, Tex. 
THE 21ST AEROSPACE MECHANISMS SYMPOSIUM 
- ACTUATORS, DEPLOYMENT, LARGE SPACE STRUCTURES, MANIPULATORS, ROBOTICS, SPACE ERECTABLE STRUCTURES 

N87-18139*#  National Aeronautics and Space Administration. Goddard Space Flight Center, Greenbelt, Md. 
GEOMORPHOLOGY FROM SPACE: A GLOBAL OVERVIEW OF REGIONAL LANDFORMS 
NICHOLAS M. SHORT, ed. and ROBERT W. BLAIR, JR., ed. (Fort Lewis A&M Coll., Durango, Colo.) 1986 737 p Original contains color illustrations (NASA-SP-486; NAS 1.21:486; LC-86-17974) Avail: SOD HC $41.00 as 033-000-00994-1; NTIS MF E03 CSLCL 08E 
This book, Geomorphology from Space: A Global Overview of Regional Landforms, was published by NASA STIF as a successor to the two earlier works on the same subject: Mission to Earth: LANDSAT views the Earth, and ERTS-1: A New Window on Our Planet. The purpose of the book is threefold: first, to serve as a stimulant in rekindling interest in descriptive geomorphology and landforms analysis at the regional scale; second, to introduce the community of geologists, geographers, and others who analyze the Earth's surficial forms to the practical value of space-acquired remotely sensed data in carrying out their research and applications; and third, to foster more scientific collaboration between geomorphologists who are studying the Earth's landforms and astrogeologists who analyze landforms on other planets and moons in the solar system, thereby strengthening the growing field of comparative planetology. 

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 
- ALBEDO, BIDIRECTIONAL REFLECTANCE, DESERTS, DIRECTIVITY, SOLAR POSITION, ZENITH 

N87-27315*#  National Aeronautics and Space Administration, Washington, D.C. 
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 
- ALBEDO, BIDIRECTIONAL REFLECTANCE, DESERTS, DIRECTIVITY, SOLAR POSITION, ZENITH 

N87-27315*#  National Aeronautics and Space Administration, Washington, D.C. 
EARTH RESOURCES: A CONTINUING BIBLIOGRAPHY WITH INDEXES (ISSUE 54) 
Apr. 1987 164 p (NASA-SP-7041(54); NAS 1.21:7041(54)) Avail: NTIS HC A08 CSLCL 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

BIDIRECTIONAL REFLECTANCE MEASUREMENTS OF systems, instrumentation and sensors, and economic analysis.

DESERTS

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

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

J. H. PARK, L. S. ROTHMAN, C. P. RINSLAND, H. M. PICKETT, DAVID E. BOWKER and RICHARD E. DAVIS

Sep. 1987 26 p
(NASA-TP-1188; L-16330; NAS 1.61:1188) Avail: NTIS HC A09/MF A01 CSCL 04A

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, N2O, CO, CH4, O3, NO, SO2, NO2, NH3, HNO3, OH, HF, HCl, HBr, HI, OCS, H2CO, HOCI, N2, HCN, CH3CI, CH3CH3, C2H4, C2H6, PH3), which appear in the 1986 Air Force Geophysics Laboratory high-resolution transmission molecular absorption data base (HIITRAN) compilation, and for O(P-3), O-18 isotopic ozone, and NO2 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 2000/cm(sup)-1 and are included as a separate data file in the 1986 HITRAN database.

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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, Ohio.

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 A01 CSCL 10B

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

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

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 A01 CSCL 10C

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

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GEOPHYSICS

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

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

AIRBORNE LIDAR MEASUREMENTS OF EL CHICHON STRATOSPHERIC AEROSOLS, MAY 1983

M. P. MCCORMICK and M. T. OSBORN (SASC Technologies, Inc., Hampton, Va.)
Oct. 1986 91 p
(NASA-CP-1172; L-16176; NAS 1.61:1172) Avail: NTIS HC A05/MF A01

An experimental survey flight to determine the spatial distribution and aerosol characteristics of the El Chichon-produced stratospheric aerosol was conducted in May 1983. The mission included several different sensors flown aboard the NASA Convair 990 at latitudes between 72 deg. and 56 deg. S. This report presents the lidar data from that flight mission. Representative profiles of lidar backscatter ratio, plots of integrated backscattering function versus latitude, and contours of backscatter mixing ratio versus latitude and altitude 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 0.5943 microns varied between 3.5 and 4.5, and the peak integrated backscattering function was about 18 X 10 to the -4 power/sr, corresponding to a peak optical depth calculated to be approximately 0.08. This report presents the results of this mission in a ready-to-use format for atmospheric and climatic studies.

Author

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

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

E. E. REMSBERG, R. J. KURZEJA, K. V. HAGGARD, J. M. RUSSELL, Ill, and L. L. GORDLEY
Dec. 1986 73 p
(NASA-TP-2625; L-16136; NAS 1.60:2625) Avail: NTIS HC A04/MF A01 CSCL 04A

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

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

FUTURE DIRECTIONS FOR H SUB X O SUB Y DETECTION

Conference held in Menlo Park, Calif., 12-15 Aug. 1985
(NASA-CP-2448; L-16216; NAS 1.55:2448) Avail: NTIS HC A04/MF A01 CSCL 04A

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-CP-1173; L-16177; NAS 1.61:1173) Avail: NTIS HC A12/MF A01 CSCL 04A

The Stratospheric Aerosol and Gas Experiment (SAGE) satellite system, launched February 18, 1979, obtained profiles of aerosol extinction at 1.00 micron and 0.45 micron ozone concentration, and nitrogen dioxide concentration. Data taken during sunset events are presented in the form of zonal and seasonal averages of

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

Author

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METEOROLOGY AND CLIMATOLOGY

Includes weather forecasting and modification.

46 GEOPHYSICS

N87-18245* # 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

A lidar-equipped NASA Electra aircraft was flown in January 1984 between the latitude of 38 and 90 deg N. One of the primary purposes of this mission was to determine the spatial distribution and aerosol characteristics of El Chichon produced stratospheric material. Lidar data from that portion of the flight mission between 38 deg N and 77 deg N is presented. Representative profiles of lidar backscatter ratio, a plot of the integral backscattering function versus latitude, and contours of backscatter mixing ratio versus altitude and latitude are given. In addition, tables containing numerical values of the backscatter ratio and backscattering function versus altitude are applied for each profile. These data clearly show that material produced by the El Chichon eruptions of late March-early April 1982 had spread throughout the latitudes covered by this mission, and that the most massive portion of the material resided north of 55 deg N and was concentrated below 17 km in a layer that peaked at 13 to 15 km. In this latitude region, peak backscatter ratios at a wavelength of 0.6943 microns were approximately 3 and the peak integrated backscattering function was about 15 X 10 to the -4/hr 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

N87-20665* # National Aeronautics and Space Administration. Marshall Space Flight Center, Huntsville, Ala.

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

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

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

NASA/MSFC FY-85 ATMOSPHERIC PROCESSES RESEARCH REVIEW

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

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

ON REQUIREMENTS FOR A SATELLITE MISSION TO MEASURE TROPICAL RAINFALL

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

Author

N87-22341*# National Aeronautics and Space Administration. Langley Research Center, Hampton, Va.
ATMOSPHERIC TURBULENCE RELATIVE TO AVIATION, MISSILE, AND SPACE PROGRAMS
AIRCRAFT SAFETY, ATMOSPHERIC MODELS, ATMOSPHERIC TURBULENCE, CONFERENCES, MISSILES, SPACE PROGRAMS, WEATHER FORECASTING

N87-26489*# National Aeronautics and Space Administration. Langley Research Center, Hampton, Va.
ATLAS OF WIDE-FIELD-OF-VIEW OUTGOING LONGWAVE RADIATION DERIVED FROM NIMBUS 6 EARTH RADIATION BUDGET DATA SET, JULY 1975 TO JUNE 1978
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-field-of-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

N87-26491*# National Aeronautics and Space Administration. Langley Research Center, Hampton, Va.
CALIBRATION OF THE SPIN-SCAN OZONE IMAGER ABOARD THE DYNAMICS EXPLORER 1 SATELLITE
ALGORITHMS, CALIBRATING, DYNAMICS EXPLORER 1 SATELLITE, OZONE, REGRESSION ANALYSIS, ULTRAVIOLET SPECTROMETERS

N87-29996*# National Aeronautics and Space Administration. Goddard Space Flight Center, Greenbelt, Md.
FIVE YEAR GLOBAL DATASET: NMC OPERATIONAL ANALYSES (1978 TO 1982)
DAVID STRAUS and JOSEPH ARDIZZONE Sep. 1987 50 p Prepared in cooperation with Sigma Data Services Corp., Rockville, Md. (NASA-CP-1194; REPT-87B0273; NAS 1.61:1194) Avail: NTIS HC A02/MF A01 CSCL 04B
This document describes procedures used in assembling a five year dataset (1978 to 1982) using NMC Operational Analysis data. These procedures entailed replacing missing and unacceptable data in order to arrive at a complete dataset that is continuous in time. In addition, a subjective assessment on the integrity of all data (both preliminary and final) is presented. Documentation on tapes comprising the Five Year Global Dataset is also included. Author

N87-24870* National Aeronautics and Space Administration. Goddard Space Flight Center, Greenbelt, Md.
ARCTIC SEA ICE, 1973-1976: SATELLITE PASSIVE-MICROWAVE OBSERVATIONS
The Arctic region plays a key role in the climate of the earth. The sea ice cover affects the radiative balance of the earth and radically changes the fluxes of heat between the atmosphere and the ocean. The observations of the Arctic made by the Electrically Scanning Microwave Radiometer (ESMR) on board the Nimbus 5 research satellite are summarized for the period 1973 through 1976. B.G.

51 LIFE SCIENCES (GENERAL)

N87-20727*# National Aeronautics and Space Administration. Marshall Space Flight Center, Huntsville, Ala.
LIQUID DROP STABILITY FOR PROTEIN CRYSTAL GROWTH IN MICROGRAVITY
ROBERT B. OWEN, BETH H. BROOM, ROBERT S. SNYDER, and RON DANIEL Apr. 1987 17 p (NASA-TP-2724; NAS 1.60:2724) Avail: NTIS HC A02/MF A01 CSCL 06B
CRYSTAL GROWTH, DROPS (LIQUIDS), MICROGRAVITY APPLICATIONS, PROTEIN SYNTHESIS, STABILITY

52 AEROSPACE MEDICINE

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

N87-18976* National Aeronautics and Space Administration, Washington, D.C.
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 261 through 292 of Aerospace Medicine and Biology: A Continuing Bibliography. It includes seven indexes - subject, personal author, corporate source, foreign technology, contract number, report number, and accession number. Author
52 AEROSPACE MEDICINE

N87-30041* National Aeronautics and Space Administration, Washington, D.C.
AEROSPACE MEDICINE AND BIOLOGY: A CONTINUING BIBLIOGRAPHY WITH INDEXES (SUPPLEMENT 302)
Oct. 1987 55 p
(NASA-SP-7011(302); NAS 1.21:7011(302)) Avail: HC A04
CSCL 096

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

61

COMPUTER PROGRAMMING AND SOFTWARE

Includes computer programs, routines, and algorithms, and specific applications, e.g., CAD/CAM.

N87-10720* National Aeronautics and Space Administration. Goddard Space Flight Center, Greenbelt, Md.
PROCEEDINGS OF THE 5TH ANNUAL USERS’ CONFERENCE
M. SZCZUR, ed. and E. HARRIS, ed. 1985 400 p Conference held at Greenbelt, Md., 4-6 Jun. 1985
(NASA-CP-2399; NAS 1.55:2399) Avail: NTIS HC A17/MF A01
CSCL 09B

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

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

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

N87-19932* National Aeronautics and Space Administration, Washington, D.C.
COMPUTER SCIENCES AND DATA SYSTEMS, VOLUME 2
(NASA-CP-2459-VOL-2; NAS 1.55:2459-VOL-2) Avail: NTIS HC A15/MF A01
CSCL 09B

CONFERENCES, DATA STORAGE, DISTRIBUTED PROCESSING, FIBER OPTICS, OPTICAL DATA PROCESSING, PARALLEL PROCESSING (COMPUTERS), VHSC (CIRCUITS)

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

APPLICATIONS PROGRAMS (COMPUTERS), COMPUTER SYSTEMS PROGRAMS, CONFERENCES, IMAGE PROCESSING, INFORMATION SYSTEMS, MAN-COMPUTER INTERFACE, OPERATING SYSTEMS (COMPUTERS)

N87-25531* National Aeronautics and Space Administration. Goddard Space Flight Center, Greenbelt, Md.
FRONTIERS OF MASSIVELY PARALLEL SCIENTIFIC COMPUTATION
(NASA-CP-2478; REPT-87B0976; NAS 1.55:2478) Avail: NTIS
HC A13/MF A01
CSCL 09B

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

62

COMPUTER SYSTEMS

Includes computer networks and special application computer systems.

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

GROUND TESTS, REAL TIME OPERATION, SIMULATORS, TEST FACILITIES

64

NUMERICAL ANALYSIS

Includes iteration, difference equations, and numerical approximation.

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

COMPUTER PROGRAMMING, CRITICAL PATH METHOD, DIFFERENTIAL EQUATIONS, NONLINEAR EQUATIONS, PARAMETER IDENTIFICATION

N87-14918* National Aeronautics and Space Administration. Lewis Research Center, Cleveland, Ohio.
SOLUTION OF ELLIPTIC PARTIAL DIFFERENTIAL EQUATIONS 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 A02/MF A01
CSCL 12A

ELLIPITC DIFFERENTIAL EQUATIONS, ELLIPTIC FUNCTIONS, PARTIAL DIFFERENTIAL EQUATIONS, PROBLEM SOLVING
N87-22441* National Aeronautics and Space Administration. 
Langley Research Center, Hampton, Va. 
QUANTITATIVE ANALYSIS OF THE RECONSTRUCTION PERFORMANCE OF INTERPOLANTS 
DONALD L. LANSING and STEPHEN K. PARK (College of William and Mary, Williamsburg, Va.) May 1987 35 p 
(NASA-TP-2688; L-16164; NAS 1.60:2688) Avail: NTIS HC 
A03/MF A01 CSCL 12A 
INTERPOLATION, QUANTITATIVE ANALYSIS, RECONSTRUCTION 

N87-22447* National Aeronautics and Space Administration. 
Langley Research Center, Hampton, Va. 
AN ALGORITHM FOR SURFACE SMOOTHING WITH RATIONAL SPLINES 
JAMES R. SCHIESS Jun. 1987 17 p 
(NASA-TP-2708; L-16272; NAS 1.60:2708) Avail: NTIS HC 
A02/MF A01 CSCL 12A 
ALGORITHMS, RATIONAL FUNCTIONS, SMOOTHING, 
SPLINE FUNCTIONS, SURFACE ROUGHNESS 

N87-28357* National Aeronautics and Space Administration. 
Langley Research Center, Hampton, Va. 
EXPERIMENTS IN ENCODING MULTILEVEL IMAGES AS QUADTREES 
DONALD L. LANSING Sep. 1987 60 p 
(NASA-TP-2722; L-16292; NAS 1.60:2722) Avail: NTIS HC 
A04/MF A01 CSCL 12A 
CODING, DATA COMPRESSION, DATA STORAGE, GRAY SCALE, IMAGE PROCESSING 

65 
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 
(NASA-TP-2709; L-16264; NAS 1.60:2709) Avail: NTIS HC 
A02/MF A01 CSCL 12A 
CONFIDENCE LIMITS, FAILURE ANALYSIS, PREDICTIONS, RELIABILITY ANALYSIS, SOFTWARE ENGINEERING 

N87-27474* National Aeronautics and Space Administration. 
Marshall Space Flight Center, Huntsville, Ala. 
PROBABLISTIC RISK ANALYSIS OF FLYING THE SPACE SHUTTLE WITH AND WITHOUT FUEL TURBINE DISCHARGE TEMPERATURE REDLINE PROTECTION 
LEONARD HOWELL Aug. 1987 22 p 
(NASA-TP-2759; NAS 1.60:2759) Avail: NTIS HC A02/ MF A01 CSCL 12A 
ENGINE FAILURE, MATHEMATICAL MODELS, SPACE SHUTTLE MAIN ENGINE, SPACECRAFT RELIABILITY, 
STOCHASTIC PROCESSES, TEMPERATURE SENSORS
73 NUCLEAR AND HIGH-ENERGY PHYSICS

NUCLEAR AND HIGH-ENERGY PHYSICS

Includes elementary and nuclear particles; and reactor theory.

N87-17487*# National Aeronautics and Space Administration. Langley Research Center, Hampton, Va.

DOUBLY DIFFERENTIAL CROSS SECTIONS FOR GALACTIC HEAVY-ION FRAGMENTATION

FRANCIS A. CUCINOTTA (Old Dominion Univ., Norfolk, Va.), JOHN W. NORBURY, GOVIND S. KHANDELWAL, and LAWRENCE W. TOWNSEND Feb. 1987 23 p

(NASA-TP-2659; L-16187; NAS 1.60:2659) Avail: NTIS HC A02/MF A01 CSCL 20H

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

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

NUCLEI AND ANTINUCLEI


(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)

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 A01/MF A01 CSCL 20F

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

75 PLASMA PHYSICS

Includes magnetohydrodynamics and plasma fusion.

N87-16976*# 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 A02/MF A01 CSCL 20I

ENERGY CONVERSION EFFICIENCY, LASER PLASMA INTERACTIONS, MAGNETOHYDRODYNAMIC GENERATORS

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

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

81 ADMINISTRATION AND MANAGEMENT

Includes management planning and research.

N87-20833* National Aeronautics and Space Administration, Washington, D.C.

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 in 1986. 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.

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


(NASA-SP-7039(31); NAS 1.21:7039(31)) Avail: NTIS HC A03 NTIS standing order as PB86-911100, $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, D.C.


(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
89 ASTRONOMY

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

85 URBAN TECHNOLOGY AND TRANSPORTATION

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

N87-70425* National Aeronautics and Space Administration, Washington, D.C.
SIGNIFICANT NASA INVENTIONS. AVAILABLE FOR LICENSING IN FOREIGN COUNTRIES 1977-1986 103 p (NASA-SP-7038(04); NAS 1.21:7038(04)) Avail: SOD HC $5.00 as 003-000-00966-1; NTIS MF A01

SPACE SCIENCES (GENERAL)

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

N87-22573*# National Aeronautics and Space Administration. Goddard Space Flight Center, Greenbelt, Md.
INFRARED SOURCE CROSS-INDEX, FIRST EDITION
MARIAN SCHMITZ (Computer Sciences Corp., Beltsville, Md.), JAYLEE M. MEAD, and DANIEL Y. GEZARI Apr. 1987 323 p (NASA-RP-1182; REPT-87B0058; NAS 1.61:1182) Avail: NTIS HC A14/MF A01 CSCL 03A
The Infrared Source Cross-Index is a listing of correlated infrared source names (and positions) for astronomical objects observed at 1-1000 microns. The source names have been obtained from the database of the first edition of the Catalog of Infrared Observations (CIO: NASA RP 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
91 LUNAR AND PLANETARY EXPLORATION

Includes planetoLOGY; and manned and unmanned flights.

92 SOLAR PHYSICS

Includes solar activity, solar flares, solar radiation and sunspots.
ATMOSPHERE, SOLAR CORONA, SOLAR MAGNETIC FIELD, SOLAR PHYSICS, SOLAR PROMINENCES, SUN

N87-20947** National Aeronautics and Space Administration. Marshall Space Flight Center, Huntsville, Ala.

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

SOLAR FLARES, SOLAR PROMINENCES, STATISTICAL ANALYSIS

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

RAPID FLUCTUATIONS IN SOLAR FLARES

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

93

SPACE RADIATION

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

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

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

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

Author

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GENERAL

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

ENGINEER IN CHARGE: A HISTORY OF THE LANGLEY AERONAUTICAL LABORATORY, 1917-1958
JAMES R. HANSEN (Maine Univ., Orono.) Washington, D.C. 1986 643 p NASA History Series (NASW-3502) (NASA-SP-4305; NAS 1.21:4305) Avail: SOD HC $30.00 as 039-000-00999-2; NTIS MF A01 CSCL 05B

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

B.G.
SUBJECT INDEX

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Pilot's 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] p 2 N87-10843

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Effects of high speed and engine arrangement on drag of a typical single-engine fighter at alt [NASA-TP-2352] p 8 N87-10838
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AERODYNAMIC FORCES
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AERODYNAMIC HEATING
First-element near-surface transfer analysis of space shuttle Orbiter [NASA-TP-2657] p 16 N87-29795

AERODYNAMIC INTERFERENCE
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] p 8 N87-10870

AERODYNAMIC STABILITY

AERODYNAMIC STALLING
Investigation of the effect of tail configuration on stall, spin, and recovery characteristics of a low-wing general aviation research airplane [NASA-TP-2644] p 6 N87-16815
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